

# **TROPICAL JOURNAL OF NEPHROLOGY**

*The Official Journal of the Nigerian Association of Nephrology*

## **AIMS and SCOPE**

The aims and scope include the following:

- 1. To provide a medium of exchange of ideas and knowledge of nephrology in the tropics through publication of research works, clinical experiences and relevant articles.*
- 2. To promote nephrology education, clinical practice and research through publication of original research works, innovative clinical experience and authoritative review articles on topical issues.*
- 3. To provide an avenue for global dissemination of consensus positions on issues of concern in tropical nephrology through publication of proceedings of consensus meetings, dedicated conferences and commissioned reviews.*
- 4. To serve as a scientific link between the Nigerian Association of Nephrology and other such International Organizations all over the world.*

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# **TROPICAL JOURNAL OF NEPHROLOGY**

*The Official Journal of the Nigerian Association of Nephrology*

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# **TROPICAL JOURNAL OF NEPHROLOGY**

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## **Editorial**

Gradually the Tropical Journal of Nephrology (TJN) is gathering momentum and has reached volume 4. It has not been easy to ensure regular publications as it is with most young Journals. However with the determination of the Editorial Board and Nigerian Association of Nephrology (NAN) Executives, the TJN will continue to serve as a source of information on current nephrology practices in the Tropics and by extension provides opportunities for global dissemination of research reports, guidelines and issues in Nephrology to other parts of the world.

The joint meeting of the 10<sup>th</sup> Congress of the African Association of Nephrology (AFRAN) and 21<sup>st</sup> Conference of the Nigerian Association of Nephrology (NAN) “ABUJA 2009” has come and gone but its impact has remained with us. The current edition of TJN provides you with the scientific papers that were presented at the meeting. Going through the different abstracts, it reflects profound erudition with robust scientific contents. The abstracts cut across nephrology practice and research in Africa.

This edition also featured four (4) other original articles and a review article from NAN members in the Diaspora. The article on Hemodialysis dose and survival in acute kidney injury is a state of the art presentation and reviews the minimum effective dose of hemodialysis that has a positive effect on mortality and survival in acute kidney injury. The article from Osogbo is a reminder to us all on issues relating to preventive nephrology in the community. A staggering 48% of the cohort studied could be grouped into pre-hypertensive stage suggesting that there is already a large pool of candidates who may be at risk of becoming hypertensive in the near future. The findings underscore the need to encourage life style modification efforts among university students.

The remaining three (3) articles are worthy of reading, one showed lack of response to steroid in the treatment of sensorineural hearing loss, a condition that may occur in CKD, the other two looked at pattern of renal function in subjects with cancer of the cervix and issues of dry weight in children with nephropathy.

The TJN will continue to need your supports and patronage to survive, please continue to give us the opportunity to review your works.

Thank you

**BL Salako**  
*Managing Editor*

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*Arije A, Kadiri S, Akinkugbe O.O. The viability of haemodialysis as a treatment option for renal failure in a developing economy. Afr. J. Med Sci., 2000; 29 : 311 – 314*

*Kleinknecht, D. Epidemiology of acute renal failure in France today. In: Acute renal failure in the intensive therapy unit (eds Bihali, D, Neild, G) 1990; pp13-22. Springer – Verlag. New-York.*

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**Abstracts Presented at the Joint Meeting of 10<sup>th</sup> Congress of African Association of Nephrology (AFRAN) and 21<sup>st</sup> Congress of Nigerian Association of Nephrology (NAN) 'ABUJA 2009' in collaboration with International Society of Nephrology (ISN)**

*Oral Presentations*

**HYPERTENSION AND CHRONIC KIDNEY DISEASE**

**Abstract TOR 1:**

**AVERAGED MULTIPLE PRE AND POST-DIALYSIS BLOOD PRESSURE MEASUREMENTS PREDICT LEFT VENTRICULAR MASS INDEX AND PULSE WAVE VELOCITY AS EFFECTIVELY AS 24-HOUR AMBULATORY BLOOD PRESSURE VALUES IN HAEMODIALYSIS PATIENTS**

*James Chabu<sup>1,2</sup>, Saraladevi Naicker<sup>2</sup>, Pravin Manga<sup>3</sup>, Angela Woodiwiss<sup>4</sup> and Gavin Norton<sup>4</sup>  
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Department of Internal Medicine and School of Physiology<sup>4</sup>, Faculty of Health Sciences,  
University of the Witwatersrand, Johannesburg, South Africa.*

**Background:** Although hypertension is a common, and an established major determinant of cardiovascular target organ changes in chronic renal failure, the best method of measuring blood pressure (BP) when predicting cardiovascular damage in chronic kidney disease is uncertain. The value of multiple pre- and post-dialysis blood pressure (BP) measurements in patients on haemodialysis is uncertain.

**Methods:** This study assessed whether 24-hour BP predicts cardiovascular target organ changes better than pre-, post- and averaged dialysis BP in 79 patients receiving maintenance haemodialysis (MHD) for an average of ~49 (3-300) months. 3 Pre- and 3 post-dialysis BPs were determined over 3 sessions of dialysis per week for 4 weeks and the average calculated from the mean of these measurements. Pulse wave analysis performed at the carotid, femoral and radial artery was employed to determine carotid-femoral pulse wave velocity (PWV) and central augmentation index (AIC). Echocardiography was performed to determine left ventricular mass (LVM) which was indexed to body surface area (LVMI).

**Results:** Using multivariate regression analysis with adjustments for potential confounders, pre- (p=0.005), post- (p<0.05) and averaged dialysis (p < 0.015) systolic BP were associated with LVMI and PWV. Neither 24 hour (r = 0.260, p < 0.05), day (r = 0.250, p< 0.05), nor night (r= 0.240, p <0.05) systolic BP were more closely associated with LVMI than the averaged dialysis systolic BP (r = 0.27, p < 0.02). Moreover, neither 24 hour (r = 0.410, p = 0.0003), day (r=0.400, p = 0.0005), nor night (r =0.410, p< 0.0005) systolic BP were more closely associated with PWV than the post-dialysis systolic BP (r=0.390, p=0.0001).

**Conclusions:** These results indicate that the average of multiple pre- and post- dialysis BP measurements are equally effective in predicting cardiovascular target organ changes (LVMI and PWV) as 24-hour ambulatory BP values in patients receiving HD.

**Abstract TOR 2:**

**PREDICTORS OF KIDNEY DAMAGE IN NEWLY DIAGNOSED HYPERTENSIVE PATIENTS**

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*Division of Nephrology, Department of Medicine, University of Ilorin Teaching Hospital, Ilorin, Nigeria.*

**Background:** Systemic hypertension is a well known cause of kidney damage and one of the leading causes of chronic kidney disease which is currently assuming epidemic proportion worldwide with its associated morbidities and prohibitive healthcare costs, particularly in emerging economies of sub-Saharan Africa. Identifying predictors of hypertensive kidney damage would provide clinicians with opportunity for appropriate therapeutic interventions to forestall initial or further kidney damage and ultimately prevent development of chronic kidney disease.

**Aim:** To determine the predictors of kidney damage using microscopic haematuria as surrogate marker in newly diagnosed hypertensive patients.

**Methods:** This is a post hoc analysis of the original cross-sectional study of urinary sediment in one hundred and thirty-eight newly diagnosed Nigerian hypertensive patients. Subjects with other conditions associated with urinary sediment formation including urinary tract infection were excluded. The surrogate marker of kidney damage was significant microscopic haematuria defined as  $\geq 3$ /hpf. This was determined by examination of urine sediment under a bright field microscope having centrifuged the urine and application of supravital Sternheimer's stain which is a mixture of Copper-phthalocyanine dye, national fast blue and a xanthene dye called pyronin B. Sternheimer's stain is used as an alternative to phase contrast microscope to enhance identification of elements of urinary sediment. Potential predictors of kidney damage evaluated were: age, sex, systolic blood pressure (SBP), diastolic blood pressure (DBP), mean arterial blood pressure (MAP), pulse pressure (PP), and body mass index (BMI). SPSS version 13 statistical soft ware was used to analyze the data. The strength of association between the variables and kidney damage was determined by correlation statistics while regression methods were used to quantify the association and to predict kidney damage.

**Results:** The mean age of the patients was  $43.2 \pm 9.6$  years and 76 (55%) were males. Twenty-one (15.2%) patients have significant microscopic haematuria while 27 (19%) have insignificant haematuria of  $\leq 2$ /hpf. SBP correlates positively, though weak but significant with kidney damage ( $r=0.209$ ,  $p=0.048$ ). Stepwise regression models identified SBP as the best sole predictor of kidney damage ( $r=0.557$ ,  $r^2=0.310$ , adjusted  $r^2=0.272$ ,  $df=1$ ,  $P_{anova}=0.011$ ,  $P_{coeff}=0.011$ ) while SBP and Age were the next predictors accepted by the model ( $r=0.72$ ,  $r^2=0.505$ , adjusted  $r^2=0.447$ ,  $df=2$ ,  $P_{anova}=0.003$ ,  $P_{coeff}(SBP)=0.001$ ,  $P_{coeff}(Age)=0.019$ ). Other variables were rejected by the model (probability level of entrance was  $\leq 0.05$  and removal,  $\geq 0.1$ ).

**Conclusions:** The study suggests that systolic blood pressure may be the predictor of kidney damage in newly diagnosed hypertensive patients, and this effect seems to be amplified with increasing age. However, a strong conclusion can not be drawn on the association because of the cross-sectional design and small population sample of the study. A longitudinal study with large population is recommended to confirm this relationship.

**Abstract TOR 3:**

**IS THERE AN ASSOCIATION BETWEEN INDICES OF ARTERIAL STIFFNESS/WAVE REFLECTION AND LEFT VENTRICULAR MASS INDEX IN PATIENTS RECEIVING HAEMODIALYSIS?**

*James Chabu<sup>1,2</sup>, Saraladevi Naicker<sup>2</sup>, Pravin Manga<sup>3</sup>, Angela Woodiwiss<sup>4</sup> and Gavin Norton<sup>4</sup>  
ISN Fellow Konkola Mine Hospital<sup>1</sup>, Zambia, Divisions of Nephrology<sup>2</sup> and Cardiology<sup>3</sup>  
Department of Internal Medicine and School of Physiology<sup>4</sup>, Faculty of Health Sciences,  
University of the Witwatersrand, Johannesburg, South Africa.*

The relationship between aortic stiffness and function and LVM in patients on HD is uncertain. This study assessed whether large artery function is associated with LVMI in 94 non-diabetic patients receiving MHD for an average of ~49 (3-300) months. Pulse wave analysis performed at the carotid, femoral and radial arteries was employed to determine carotid-femoral PWV and AIC. Echocardiography was performed to determine LVM which was indexed to body surface area (LVMI). Despite relations noted between systolic blood pressure and LVMI ( $r=0.36$ ,  $p<0.0005$ ) and pulse pressure and LVMI ( $r=0.44$ ,  $p<0.0001$ ), on univariate analysis no relationship between either PWV ( $r=-0.08$ ), or AIC ( $r=-0.10$ ) and LVMI was noted. Further, despite significant relations noted between systolic blood pressure and the mean of LV posterior and septal wall thickness (LV mean wall thickness-MWT) ( $r=28$ ,  $p<0.01$ ) and pulse pressure and LV MWT ( $r=0.27$ ,  $p<0.02$ ), on univariate analysis no relationship between PWV ( $r=-0.11$ ), or AIC ( $r=0.03$ ) and LV MWT was noted. Adjustments for potential confounders did not reveal a relationship between large artery function and either LVMI, or LV MWT. In conclusion, these results suggest that large artery dysfunction plays little role in contributing toward LVM or wall thickness in patients receiving chronic HD.

**Abstract TOR 4:**

**SCREENING, DETECTION AND RESPONSE TO TREATMENT OF RENAL DISEASE IN HIV INFECTED INDIVIDUALS: A SINGLE CENTRE PROSPECTIVE STUDY**

*June Fabian\*, Saraladevi Naicker\*, Francois Venterm and Stewart Goetsch\*  
\*University of the Witwatersrand, Johannesburg, South Africa  
Reproductive Health and Research Unit, Johannesburg, South Africa*

This study was designed to screen antiretroviral therapy (ART)-naïve human immunodeficiency virus (HIV) infected patients for proteinuria, using urine dipsticks, at the HIV outpatient clinic at Johannesburg Hospital in an attempt to detect and treat early renal disease. In those with persistent proteinuria, a marker of kidney disease, renal biopsy was performed, ART with/out angiotensin-converting enzyme inhibitors (ACE-I) was initiated and patients were followed up for immunological and renal responses. After a minimum period of 12 months, a repeat biopsy was performed, where possible, to determine whether the histological lesions had responded to treatment. During urinary screening, proteinuria, leucocyturia and microscopic haematuria were common. Sterile leucocyturia may be associated with co-morbid sexually transmitted infection or tuberculosis. In the group that underwent renal biopsy with treatment, the renal and immunological response was highly statistically significant. On biopsy, HIV-associated immune complex disease was more common than HIVAN, a finding that contradicts international and some local data. Resolution of proteinuria was relatively rapid in comparison to the histological response to treatment, an effect not previously shown. This is the first study of its kind, to the author's knowledge, that prospectively evaluates the effect of ART with/ACE-I in ART-naïve HIV infected patients with both clinicopathological and histological criteria. It has shown unequivocally, that renal disease, particularly if detected and treated early in HIV infection, is responsive to treatment. These findings suggest screening for early detection and treatment of HIV-associated renal disease should be mandatory in HIV clinics in South Africa

**Abstract TOR 5:**

**A LOOK AT THE GLOMERULAR FILTRATION RATE (GFR) OF HIV SEROPOSITIVE PATIENTS IN JOS, NIGERIA**

*Chukwuonye II, Agbaji O, Oviasu E, Agaba E, Idoko J, Onwuegbuzie G, Okpechi I and Onwuchekwa UN*

*Departments of Medicine, Jos University Teaching Hospital, Jos and \*University of Benin Teaching Hospital, Benin City, Nigeria.*

**Background and Objective:** Accurate assessment of renal function is important in human immunodeficiency virus (HIV) infected patients in order to determine the proper dose of renally excreted medications, including a number of commonly used antiretroviral drugs with known nephrotoxic potential. However, most HIV clinics in Nigeria do not estimate or measure the GFR of their patients before commencing them on antiretroviral drugs. In this prospective study, we took a look at the GFR of HIV seropositive patients attending the HIV clinic at Jos University Teaching Hospital.

**Subjects, Materials and Methods:** One hundred and fifty HIV sero-positive patients from the HIV/AIDS clinics, and 50 control subjects from the MOPD of JUTH, Jos, who met the inclusion criteria, were consecutively recruited from April 2006 to December 2006. Seventy five of the HIV sero-positive patients had AIDS, while the remaining 75 HIV sero-positive patients constituted the Non AIDS group. The CDC (Centre for Disease Control and Prevention) criteria were used in classifying the HIV sero-positive patients into two of the three groups. Twenty-four-hour urine collection as well as a blood sample from each patient in the study were taken for the determination of Creatinine Clearance (Clcr) and other relevant investigations. The data were analyzed using the EPI info software.

**Results:** Seventy-Five (50%) of the 150 HIV sero-positive patients had GFR of < 60mls/min. Thirty-Nine(52%) of these patients belonged to the AIDS group, while 36 (48% )belonged to the non AIDS group. Eight(16%) of the control subjects had GFR < 60ml/min.

**Conclusion:** The rather high percentage of retroviral positive patients with GFR < 60mls/min identified in this study informs the need for possible dose adjustment on commencement of antiretroviral drug therapy in Nigerian patients. Prior to the commencement of such therapy it is desirable to have an accurate assessment of the GFR of all patients.

**Abstract TOR 6:**

**SPECTRUM OF CLINICAL PRESENTATIONS IN HIV PATIENTS WITH RENAL DISEASE**

*Okafor UH, Unuigbo EI and Wokoma FS*

**Objective:** To determine the clinical presentations of HIV patients with renal disease.

**Materials and Methods:** HIV infected patients presenting at UBTH Benin City were screened for renal function impairment. Their biodata, serum urea, serum creatinine, serum albumin, urine protein and creatinine were assessed. Their GFR using the 6 equation of MDRD and protein excretion using protein creatinine ratio were calculated. Patients were stratified according to their renal functions into normal renal function, mild, moderate and severe renal impairment using GFR  $\geq$ 60ml/min and PCR  $\geq$  200, GFR  $\geq$ 60ml/min but PCR<200, GFR 30 – 59ml/min, GFR<30ml/min respectively. Their clinical presentations were documented. The data was analysed using SPSS Vs 13.0.

**Result:** Two hundred and four (53.3%) patients had renal function impairment, 40.2% had mild, 37.7% had moderate and 22.2% had severe impairment in their renal functions respectively. Their mean age was about 35.6±8.3 years. Easy fatiguability and weakness of the body were the commonest symptoms, occurring in 34.4% and 33.8% respectively of these patients studied. Nausea and vomiting were commonest in patients with severe impaired renal function occurring in 10(25.0%) and 16(40.0%) respectively. Urinary symptoms and body swelling were found to be commoner in patients with severe renal functional impairment. Anaemia was the commonest physical signs occurring in 45% of patients studied, 32.5% of patients with normal renal functions, and 62.5% of patients with severe renal functional impairment. Impaired conscious state, fever, hepatomegaly, pedal oedema, ascites, splenomegaly were mainly found in patients with impaired renal function. The mean systolic and diastolic blood pressure was within normal in both control and subjects with different stages of RFI.

**Conclusion:** There was an overlap in clinical presentations in HIV patients with normal and impaired renal functions but HIV patients with severe renal functional impairment were more likely to present with profound clinical features. There is need to screen all HIV patients for renal functions because clinical features may not be prominent in patients with mild/moderate renal impairment.

**Abstract TOR 7:**

**LIFESTYLE RISK FACTORS AND MARKERS OF CHRONIC KIDNEY DISEASE:  
A COMMUNITY STUDY**

*Ulası II, Ijoma CK, Arodiwe E, Onodugo OD and Okoye JU  
Renal Unit, Dept of Medicine, College of Medicine University of Nigeria*

**Introduction:** The burden and magnitude of CKD is enormous especially in developing countries. CKD currently is one of the world's major public health issues. In Nigeria there is no known population based study on CKD to date but a hospital based study suggests that ESRD constitutes about 8% of hospital admissions. In Nigeria as many other developing countries majority of the individuals afflicted with CKD are young and in their economically productive years usually in their 3<sup>rd</sup> decade of life. Worse still, a large majority of them >80% first consult a Kidney specialist after they have reached the terminal stage. These therefore underscore the need for screening for early detection of CKD. The study looks at several modifiable risk factors such as tobacco use, alcohol consumption and BMI in relation to markers of early CKD. This study was made possible by the grant from the Programme for Detection and Management of Chronic Kidney Disease, Hypertension, Diabetes and Cardiovascular Disease in Developing Countries (KHDC) initiated by the ISN in 2004.

**Method:** Socio-demographic data were obtained from 1947 adult Nigerians. Self-reported history of alcohol consumption, use of tobacco as snuff or cigarette or any other form of tobacco were obtained from the respondents using a modified WHO Steps questionnaire. Proteinuria, haematuria and estimated glomerular filtration rate (eGFR) stages 1 to 3 were used as markers of early CKD. Proteinuria was based on protein creatinine ratio (PCR) as per PARADE and CKD was defined as per KDIGO guidelines. The Statistical Package for Social Sciences (SSPS Inc, Chicago, IL) version 15 statistical software was used for data analysis. Cross tabulation assessed the association between lifestyle risk factors and markers of chronic kidney disease.

**Results:** We found significant association between use of tobacco and presence of markers of chronic kidney disease (ORs [95% CI]: 1.53[1.11–2.03],  $p = 0.008$ . The effect of consumption of alcohol on chronic kidney disease pointed to no appreciable risk. BMI was surprisingly negatively and significantly associated with markers of CKD – correlation coefficient ( $r$ ): -0.220,  $p < 0.001$ ; (ORs [95% CI]: 0.67 [0.51–0.89],  $p = 0.005$ .

**Conclusions:** Our study revealed a significant positive association between use of tobacco and markers of early CKD. We found a contradictory protective effect with increased BMI in this population. We did not find an increased risk of chronic kidney disease associated with alcohol.

**Abstract TOR 8:**

**RESTLESS LEGS SYNDROME IN NIGERIANS WITH ESRD**

*Onwuchekwa UN, Oviasu E, Ojogwu LI and Chukwuonye II*

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**Background:** Restless legs syndrome (RLS) has been shown to be a common disorder with prevalence ranging between 5 – 15% in most Caucasian population. The frequency of RLS is higher in ESRD patients than the general population. Previous studies in other parts of the world have shown a 12 – 62% prevalence of RLS in patients with ESRD. There is however, paucity of data on RLS in African Blacks with ESRD in the published literature.

**Methodology:** This is a cross-sectional descriptive study to investigate the frequency of RLS in Nigerians with ESRD. One hundred and one (101) consecutive ESRD patients were recruited from the renal unit of UBTH and Central Hospital, Benin City. The variables examined included age, sex height, weight, body mass index, educational status and blood pressure. Investigations included determination of random blood sugar, serum urea, creatinine, lipids, calcium, phosphate, albumin and the glomerular filtration rate determined using the cockcroft - Gault equation. Structured questionnaire based on the International Restless Legs Syndrome Study Group (IRLSSG) diagnostic criteria was administered to all the patients

**Results:** A total of 101 patients, were recruited and comprised 54 males and 47 females. The mean age  $\pm$  standard deviation of ESRD patients was  $47.8 \pm 15$  years mean BMI  $24.4 \pm 64.6$ , mean PCV  $\pm$  SD was  $23.62 \pm 7.03\%$ , while the mean serum Calcium  $\pm$  SD was  $7.44 \pm 0.39$  mg/dl. The mean serum urea  $\pm$  SD was  $173.69 \pm 81.93$  mg/dl, and mean serum albumin was  $3.39 \pm 25.95$  mg/dl, and mean serum cholesterol, triglyceride were  $201.64 \pm 74.79$  and  $146.85 \pm 70.37$  mg/dl respectively. Six patients, comprising 4 females and 2 males met the minimum criteria for diagnosis of RLS, giving a frequency of 5.9%

**Conclusion:** Although RLS is a common disorder in Caucasian ESRD patients, it appears to occur relatively less frequently in Nigerians with ESRD. There is however, need for a much larger scale study to determine the true prevalence of RLS amongst Nigerians with ESRD.

**Abstract TOR 9:**

**PATTERN AND CLINICAL CHARACTERISTICS OF ESRD IN ILE-IFE, NIGERIA**

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**Background:** The prevalence of chronic renal failure had remained high worldwide and the epidemiology has changed significantly in the last decade in industrialised countries. While there have been significant improvements in patient's outcomes in developed countries, their state and survival is still appalling in developing countries. We reviewed our data over a 19-year period (1989-2007) to determine the clinical pattern and outcomes in our CRF population.

**Methodology:** Seven hundred and sixty patients' records were reviewed. The data on major causes, clinical presentation, renal replacement therapy offered and survival were retrieved and collated. Data was analysed using SPSS package version 16.

**Results:** Their ages ranged between 15-90 years (Mean  $\pm$  SD;  $39.9\pm 1.67$  years), there was a male preponderance with 534(70.3%) being males. Major presenting complaints were body swelling, uraemic symptoms and dyspnoea on exertion in more than half of the studied patients. 40.7% had headaches while 20.8% of them had associated blurring of vision. 22.2% had past history of renal disease. Aetiologic factors include chronic glomerulonephritis (43.7%), hypertension (31.1%), obstructive uropathy (6.7%), diabetes mellitus (3.7%), tubulointerstitial nephritis (2.2%), polycystic kidney disease (0.7%) and in the remaining 12% of the patients; the cause could not be ascertained. 161(21.2%) had exposure to nephrotoxic agents out of which 53.4% were herbal remedies. Renal replacement therapy offered included HD in 556(73.2%), CAPD in only 9(1.2%) patients and renal transplantation in only 7(0.9%). Only 38(6.8%) survived on HD for longer than 3 months while 7(77.8%) CAPD patients and all transplanted patients survived for between 6 months and 3 years ( $P < 0.00001$ ). Median duration of survival after diagnosis for all the patients was 2 weeks while the mean was less than 3 months.

**Conclusion:** End stage renal disease is still prevalent with chronic glomerulonephritis and hypertension being the common causes. Prognosis is still grave as most patients survive for less than 1 month.

**Abstract TOR 10:**

**CLINICO-PATHOLOGIC STUDY OF GLOMERULONEPHRITIS IN 38 ADULT NIGERIANS**

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**Background:** Glomerulonephritis (GN) remains a common cause of chronic kidney disease with nephrotic syndrome being a common presentation in our environment. Different histological findings have been reported with mesangial proliferative GN relatively more common in some centres while Minimal change GN was reported to be more common in others. We conducted this study to reassess the pattern and determine response to therapy.

**Aim:** To determine histology findings on light microscopy in adults with nephrotic syndrome and assess their response to steroids and / or immunosuppressive therapy.

**Methodology:** We studied 38 patients that presented with nephrotic syndrome. Socio-demographic data, clinical and laboratory parameters were retrieved and renal histopathology was carried out. They were managed with steroids and/or immunosuppressive therapy for periods ranging between 3 months and 3 years and the results collated. The data was analysed using SPSS package.

**Results:** A total of 60 patients completed the investigations but only 38 had successful renal biopsy. Their ages ranged between 15 and 64 years with median of 22 years. There were 23 Males which constituted 60.5% of the study group. The commonest presenting features were body swelling and frothiness of urine in 80% of the patients. Their mean serum urea, creatinine, PCV and ESR were  $8.2\pm 5.9$  mmol/L,  $148.5\pm 138.4$   $\mu$ mol/L,  $33\pm 7.3\%$  and  $92\pm 40$  mmHr Westergreen respectively. Serum and urinary albumin concentrations were  $22.2\pm 8$  g/L and  $7.5\pm 8.4$  g / day respectively. Renal histopathology (light microscopy) revealed that minimal change GN and Focal segmental GS were most common. They were observed in 9 (23.6%) patients each. 7 (18.4%) patients had membranous GN while Mesangiocapillary GN was found in 5 (13.1%). Mesangial proliferative GN in 4 (10.5%) patients, while diffuse proliferative and amyloidosis were found in 2 (5.2%) patients each. All the patients had a combination of Angiotensin Converting Enzyme Inhibitors and diuretics while only 50% had steroids and only a few had immunosuppressive therapy. Majority of the patients relapsed between 2 weeks and 4 months of discontinuing therapy.

**Conclusion:** Minimal change GN and FSGS were found to be common. Steroid and immunosuppressive therapy was beneficial in some of the patients with Minimal change GN. There is the need for immunoperoxidase staining and electron microscopy to further characterise the histology findings.

### **MISCELLANEOUS**

#### **Abstract TOR 11:**

#### **RENAL PATTERNS AND OUTCOMES IN PATIENTS WITH ANCA-ASSOCIATED VASCULITIS: A SINGLE CENTRE EXPERIENCE BETWEEN 2000 AND 2007**

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**Introduction:** This work aims to describe clinico-biological patterns and outcomes of patients with ANCA-associated vasculitis followed in Nephrology department at teaching hospital La Conception in Marseille.

**Patients and Method:** We conducted a retrospective study including all patients diagnosed with renal vasculitis between January 1st 2000 and December 31st 2007. Socio-demographical, clinical and paraclinical data and evolution were collected from medical records. Statistical analysis was performed with Microsoft Excel 2003.

**Results:** Prevalence of ANCA associated vasculitis during the study period was 0.5 %. Among 40 cases we excluded 7 of them because of incomplete data. Twenty-five had granulomatosis Wegener (WG), 7 cases of polyangiitis microscopic (MPA) and 1 case with Churg-Strauss syndrome (SCS). Median age of patients was 57,7 years and sex-ratio 1,6. Clinical presentation was dominated by acute renal failure (100% of patients) frequently associated with pulmonary symptoms (75%), ENT (52% of WG) and neurologic symptoms (57% of MPA). Mean serum creatinine level at admission was 291 mmol/l. ANCA antibodies were found in all patients but they were atypic in 3 cases. Renal biopsy had been performed in 25 patients and revealed a pauci-immune crescentic glomerulonephritis in 96% of them. Aggressive tubulo-interstitial lesions were present in 46% of cases. Mean value of BVAS and FFS were 21,7 (10 - 41), 1,28 (1-2) and 0 for patients with WG, MPA and SCS respectively. Induction therapy combined steroids per os (1 mg/kg/j/6 weeks and tapered progressively) and cyclophosphamide IV monthly (0,7g/m<sup>2</sup> or 0,5g/m<sup>2</sup> if eGFR was <30 ml/min) in 91% of patients. Two patients with WG received therapeutic plasma exchanges and 7 patients required hemodialysis in emergency. Maintenance therapy comprised azathioprine and steroids for 75% of patients. With this protocol, we had 84% of patients in complete remission. Relapses occurred more frequently during maintenance therapy among patients with MPA (28%) compared to WG cases (12%). After one year follow-up median survival was 35 months, creatinemia was 135 mol/l. However, 24 % of patients reached end-stage renal disease within a mean period of 22,5 ± 6 months. Main complications of treatment were 6 cases of severe sepsis (with 5 deaths) and 2 cases of azathioprine induced bicytopenia.

**Conclusion:** ANCA associated vasculitis are frequent in our patients and present often with severe renal prognosis. Long-term outcomes are relatively good in spite of a mortality rate of 15% and a quarter of them entered dialysis at 3 years follow-up.

**Keywords:** RENAL OUTCOMES, ANCA ASSOCIATED VASCULITIS.

**Abstract TOR 12:**

**THE LONG - TERM CLINICAL OUTCOME OF PATIENTS WITH BIOPSY – PROVEN PROLIFERATIVE LUPUS NEPHRITIS SEEN AT GROOTE SCHUUR HOSPITAL, CAPE TOWN, SOUTH AFRICA**

*Ayodele OE and Swanepoel C*

**Background and Objective:** The development of lupus nephritis (LN) in patients with systemic lupus erythematosus (SLE) is associated with increased morbidity and mortality. Few data are available on the long-term clinical outcome of patients with proliferative LN in South Africa. We undertook a retrospective study to investigate the clinical outcomes in patients with proliferative LN with regards to demographic, clinical, immunologic and histologic features and treatment.

**Patients and Methods:** The medical records of patients with SLE attending the Renal Unit of Groote Schuur Hospital, Cape Town, South Africa, who had kidney biopsy done between January 1995 and December 2004 and subsequently followed up till December, 2007 were reviewed retrospectively. Patients who had focal proliferative LN (WHO Class III) and diffuse proliferative LN (WHO Class IV) were included in the study. The primary outcome measure was doubling of baseline serum creatinine at kidney biopsy during follow up, need for dialysis or death.

**Results:** The study population consisted of 66 patients with proliferative LN (8 with WHO Class III and 58 patients with WHO Class IV) who were followed up for a median period of 39 months (range 1 – 130 months). Sixty one patients (92.4 %) were females and 5 (7.6 %) were males (female: male ratio was 12.2: 1). The racial constitution of the study population was as follows: Caucasian – 1 (1.5 %); Mixed Race (Coloured) – 51 (77.3 %); Black – 11 (16.7 %) and Asians – 3 (4.5 %). The mean ages of the study population at diagnosis of SLE and LN were  $30.2 \pm 9.8$  years and  $31.6 \pm 10.2$  years respectively. Thirty two patients (48.5 %) reached primary end points of doubling of serum creatinine, dialysis or death. Twenty four deaths were recorded with sepsis and renal failure accounting for 70.8 % of the deaths. Patient survival rates at 5 years and 10 years were 45 % and 36 % respectively. The mean survival time of the patients with WHO Class III LN was longer than that of patients with Class IV LN (112.2 vs. 62.5 months;  $p = 0.72$ ). Factors found to predict primary end points on univariate analysis were serum creatinine at onset of LN ( $p = 0.015$ ), nephrotic range proteinuria at onset ( $p = 0.043$ ), diastolic blood pressure (DBP) at onset ( $p = 0.04$ ), interval between the onset of SLE and LN ( $p = 0.006$ ), non-remission of renal lesion at one year following therapy ( $p < 0.001$ ), average systolic blood pressure (SBP) during follow-up ( $p < 0.001$ ) and average DBP during follow-up ( $p < 0.001$ ). The SBP at onset ( $p = 0.054$ ), WHO Class IV ( $p = 0.058$ ) and the glomerular filtration rate [GFR] at diagnosis of LN using the Modification of Diet in Renal Disease [MDRD] formula ( $p = 0.089$ ) approached significance on univariate analysis. On multivariate analysis, only SBP on follow – up ( $p = 0.029$ , 95 % CI = 1.017 – 1.377) was significantly associated with primary renal outcome.

**Conclusion:** The long term prognosis of South African patients with proliferative LN is not as good as that reported in patients from Western countries. Patients with WHO Class III LN had better survival than those with WHO Class IV. The SBP on follow-up was the only factor that predict poor outcome on multivariate analysis. Sepsis and renal failure accounted for majority of the deaths recorded.

## EXPERIMENTAL NEPHROLOGY

### Abstract WOR 13:

#### **POLYMORPHISMS OF THE OBESITY GENE (LEP) HAVE EFFECTS ON KIDNEY DISEASE PHENOTYPES IN BLACK SOUTH AFRICANS**

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**Background:** Obesity and serum leptin have been associated with kidney disease. Hormones like IL-1, TNF- $\alpha$  and TGF- $\beta$  are secreted by the adipose tissue and the genes regulating these hormones have been reported as candidate genes for kidney disease. We are presently unaware of reports on the association between the Leptin gene and kidney disease phenotypes in any population.

**Methods:** We recruited 293 non-diabetic black South Africans including 210 hypertensive probands and 83 normotensive first degree relatives from Gugulethu between May 2005 and July 2006. Demographic and anthropometric data was collected from the subjects. Blood was drawn in the fasting state for glucose, creatinine, lipogram, insulin, leptin and adiponectin. Urine albumin-to-creatinine ratio (ACR) was quantified from spot urine collection. Genotyping for common polymorphisms (G2548A, C188A, A19G and C538T) of the LEP gene was done at the human genetics laboratory of the UCT by PCR and restriction enzyme digests.

**Results:** The observed genotype and allele frequencies of the studied polymorphisms in this population were comparable to the Hapmap Yoruba data for this gene. Subjects homozygous for the A allele of the A19G polymorphism (16.7%) had a significantly higher ACR compared to the other subjects ( $p < 0.05$ ). Estimated mean GFR ( $\text{ml}/\text{min}/1.73\text{m}^2$ ) was also lower in this group of subjects (AA –  $104.9 \pm 22.3$ , AG –  $105.5 \pm 29.4$ , GG –  $106.6 \pm 30.0$ ). Presence of the T allele of the C538T polymorphism had a “protective” effect over renal function with lower urine ACR and higher GFR. However, no association / effect were observed for the G2548A and C188A polymorphisms on renal phenotypes in this population.

**Conclusion:** Our study thus suggests that there is an association between the obesity gene and kidney disease in black South Africans. As this finding may have important implications on the relationship between obesity and kidney disease in Blacks, there is an urgent need for a genetic replication study to confirm / rebut these findings and for further experimental studies to be carried out on the link between obesity and kidney disease.

## DIALYSIS AND TRANSPLANTATION

### Abstract WOR 14:

#### **ASSESSMENT OF PERITONEAL MEMBRANE TRANSPORT CHARACTERISTICS OF CAPD PATIENTS AT JOHANNESBURG HOSPITAL**

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**Background:** knowledge of peritoneal membrane transport characteristics is important for the formulation of an appropriate peritoneal dialysis prescription and adequate dialysis is associated with morbidity and

mortality amongst PD patients. Peritoneal equilibration test (PET) has been widely used and validated among different population types, though not much has been reported in indigenous African populations.

**Aims and objectives:** To assess the peritoneal membrane transport characteristics among CAPD patients at Johannesburg hospital using PET and to establish a reference value for this population.

**Materials and methods:** A cross-sectional study involving 80 consecutive ESRD patients treated by CAPD. PET was performed as described in detail by Twardowsky et al. Glucose oxidase method was used for the estimation of glucose while picric acid method was used for the measurement of creatinine in the dialysate. Correction factor for the interference of glucose in the creatinine measurement in the dialysate was also calculated.

**Results:** The mean age was  $38 \pm 12.43$  years, 42.3% were females and 86% were blacks. Mean duration on PD was  $19.8 \pm 20.67$  months. The means of 4 hour D/P creatinine D/D0 glucose were  $0.74 \pm 0.13$  and  $0.55 \pm 0.5$  respectively. According to these values reference ranges for defining the transport characteristics of our patients was proposed as above 0.87 for high transporters, between 0.74 and 0.87 as high average, 0.74 to 0.61 for low average and less than 0.61 for low transporters.

**Conclusion:** We validated the PET for the assessment of peritoneal membrane characteristics in indigenous African patients and a reference range for the classification of these patients proposed.

**Abstract WOR 15:**

**ASSESSMENT OF NUTRITIONAL STATUS OF CAPD PATIENTS AT JOHANNESBURG HOSPITAL**

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**Background:** Malnutrition, associated with morbidity and mortality, is reported to be prevalent among PD patients. Various nutritional parameters including anthropometric and biochemical measurements are used in the assessment of these patients. Subjective Global Assessment (SGA) is a simple and reliable tool for the assessment of nutrition and is validated in various PD populations.

**Aims and objectives:** To assess the nutritional status of CAPD patients at Johannesburg hospital and to identify a correlation between subjective global assessment, specific anthropometric parameters and albumin levels in these patients.

**Materials and Methods:** SGA using seven variables derived from medical history, and physical examination was administered to 50 consecutive adult CAPD patients. Anthropometric parameters including body mass index (BMI), mid upper arm circumference (MUAC), triceps skin fold (TSF), arm muscle area (AMA), and arm fat area (AFA) were assessed. Serum albumin and total cholesterol levels were also measured.

**Results:** The mean age was  $37.9 \pm 13.4$  years, 54% were males and 74% were blacks. The mean BMI was  $24.76 \pm 3.50$  mean MUAC was  $28.53 \pm 3.89$  mean TSF  $85.6 \pm 41.48$ , mean serum albumin was  $37.10 \pm 7.6$  while mean serum cholesterol was  $5.32 \pm 1.7$ . Based on SGA scores 42% of our patients were well nourished, 50% moderately undernourished while 8% were severely malnourished. We noted significant correlation between SGA score and BMI, MUAC while there is no significant correlation with serum albumin level.

**Conclusion:** Malnutrition is common among CAPD patients in our center and SGA is a reliable method for nutritional assessment in our patients.

## ACUTE RENAL FAILURE AND TOXIC NEPHROPATHIES

### Abstract WOR 16:

#### NEPHROTOXICS FREQUENTLY CAUSE HOSPITAL-ACQUIRED ACUTE KIDNEY INJURY IN CRITICALLY ILL NIGERIAN CHILDREN

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**Objectives:** To determine the (i) hospital incidence, prevalence and aetiology; (ii) frequency of each of the acute kidney injury (AKI) stages, and (iii) 60– day outcome in Nigerian children and adolescents with hospital – acquired AKI (hAKI).

**Patients and method:** Retrospective analysis of hAKI clinicolaboratory data was performed.

**Results:** One hundred and three (103) (3.13%) of 3,286 childhood and adolescent admissions (June 2004 – June 2008) had AKI. Twenty eight (27.2%) were hAKI while 72.8% were community – acquired AKI (cAKI). Annual hAKI incidence and prevalence rates were 0.17% (or 3.7 per million children population/year [pmcp/ year]) and 0.84% (or 18.3 pmcp), respectively. Male (20): female (8) ratio was 2.5: 1. hAKI median age was 5 (0.063 – 15.0) years with 46.4% (13/28) <5 years of age. Mean time to AKI onset was 252 ± 292 (14 – 1008) hours. Mean serum creatinine (Scr) at baseline, AKI onset and maximum Scr (maxScr) were 59.0 ± 15.0 (0.67 ± 0.17 mg/dL), 272.0 ± 176.0 (3.1 ± 2.0 mg/dL), and 448.0 ± 340.0 (5.1 ± 3.8 mg/dL) µmol/L, respectively (p < 0.01). Median time to maxScr from AKI diagnosis was 60 (24 – 768) hours. maxScr was reached within 48 hours of AKI diagnosis in 14 (50%) patients; 72 – 96 hours in 5 (17.86%), and >96 hours in 9 (32.14%) patients; 68.42% (13/19) progressed from stage 1 or 2 to the next severe AKI stage. AKI–3 was the commonest hAKI type, and most anuric with high dialysis requirement (p=0.0329). Nephrotoxics (42.87%) was the leading cause of hAKI. 75% of recorded deaths were in the first 28 admission days. Median survival time was 23.5 admission (11– 52) days. Survival was similar in all AKI groups (Log rank p > 0.25). maxScr means for survivors (486.0 ± 382.0 µmol/L or 5.5 ± 4.3 mg/dL) and non-survivors (353.0 ± 160.0 µmol/L or 4.0 ± 1.8 mg/dL) were similar (p>0.20). The 60– day cumulative mortality was 30.57% (8/28).

**Conclusions:** Childhood hAKI was common in Nigeria but approximately four times less common than cAKI. Nephrotoxics caused hAKI frequently. While survival was not a function of Scr severity most deaths would occur within the first 28 admission days. The 60–day cumulative mortality was high.

### Abstract WOR 17:

#### OUTCOME OF ACUTE RENAL FAILURE ASSOCIATED WITH INGESTION OF TEETHING SYRUP- THE ZARIA EXPERIENCE

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**Background:** In November 2008 different centres in Nigeria reported a sudden increase in young children seen with acute renal failure (ARF). Several children had been given a particular teething syrup containing paracetamol suspected to have been contaminated with diethylene glycol.

**Methods:** Review of patients seen at Ahmadu Bello University Teaching Hospital, Zaria after ingestion of the teething syrup.

**Results:** Twenty nine children presented with ARF during the period, 27 (93%) of whom had been given the syrup for symptoms thought to be due to teething. In most cases the syrup had been recommended by other mothers. Of the 27 children, 18(66.7%) were male, 9 female, Ages ranged from 6 to 24 months. Presenting complaints were anuria (duration 2 to 5 days), convulsions and severe respiratory distress. Challenges faced included problems with diagnosis, shortage of equipment and staff to cope with the sudden influx of patients needing dialysis and emotional distress experienced by parents and staff. Management of the crisis situation involved the whole paediatric department, the hospital management, pharmacovigilance unit and members of the departments of surgery, anesthesia, pharmacy, pathology and hematology. Some patients died before any intervention could be carried out. Others underwent peritoneal dialysis, exchange blood transfusion, and one received fomepizole. Twenty-five patients died (93%), one was discharged and one is still undergoing treatment.

**Conclusion:** Several valuable lessons were learned including the need to develop protocols to assist and guide staff during medical crisis situations, and the importance of training all pediatricians to carry out simple peritoneal dialysis.

**Keywords:** RENAL FAILURE, CHILDREN, DIETHYLENE GLYCOL, NIGERIA

**Abstract WOR 18:**

**OUTCOME OF PAEDIATRIC DIALYSIS AT THE UNIVERSITY COLLEGE HOSPITAL  
IBADAN**

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**Background:** There are few reports on paediatric dialysis in Nigeria

**Objectives:** To describe the outcome of acute paediatric dialysis at the University College Hospital (UCH) Ibadan in terms of mortality, discharge, and serum creatinine levels.

**Methodolog:** Cases of paediatric peritoneal dialysis (PD) and haemodialysis (HD) at the UCH Ibadan performed between February 2004 and September 2008 were reviewed. Primary urinary tract related acute renal failure (PUTRARF) was defined as acute renal failure (ARF) secondary to nephropathy, uropathy, or toxic causes. Other causes of ARF were classified as multiorgan dysfunction associated ARF (MDARF). Serum creatinine of  $\geq 0.7$  mg/dL at least 7 days post dialysis was regarded as indicating full recovery of renal function.

**Results:** Forty nine patients, 25(51%) females and 24 (49%) males, aged 7 days to 16 years. (mean  $7.0 \pm 4.1$  years) had dialysis. Twenty three patients (46.9%) had HD alone, 23 PD alone; 3 (6.1%) had both HD and PD. Thirty two patients (65.3%) were in ARF and 17 (34.7%) in chronic renal failure (CRF). Among 24 patients with PUTRARF, 18 (75%) were discharged, 16 (66.7%) with normal renal function while 6 (25%)

died. Of eight patients with MDARF, four (50%) were discharged, two (25%) with normal renal function, while 4 patients died. Eleven (64.7%) patients in CRF died during admission. There was no mortality among patients who had full recovery of renal function. There was no significant difference in mortality between patients who had HD or PD.

**Conclusion:** The outcome of dialysis was relatively good in patients with ARF. Outcome in MDARF may be improved by prevention, prompt diagnosis and treatment of the primary cause. The outlook in children with CRF might be improved by early diagnosis, prompt management and establishment of facilities for chronic renal replacement therapy and paediatric renal transplant

**Abstract WOR 19:**

**HRQOL AND PERFORMANCE OF PATIENTS ON MAINTENANCE DIALYSIS; HOW ACHIEVABLE ARE K/DOQI TARGETS**

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**Background:** Maintenance haemodialysis is unaffordable and relatively inaccessible to majority of needy patients. Only about 5% of these patients are able to sustain HD for longer than 3 months.

**AIM:** To assess the quality of life and performance of ESRD patients on maintenance HD. We also set out to determine achievability of K/DOQI defined targets in these patients.

**Methodology:** We studied 22 patients that had dialysed for between 3 and 36 months. Their Socio-demographic data, clinical and laboratory parameters were retrieved and collated. HRQOL was assessed using Karnofsky performance status scale (KPSS) and the results collated. The data was analysed using SPSS package.

**Results:** Their ages ranged between 22 and 70 years with median of 41 years. Fifteen (68.2%) of them are males while females constituted 31.8%. They had between 1 and 3 sessions of HD per week with a mean of  $2.4 \pm 0.7$  sessions/week (median 3 sessions/week). Duration of sustainable HD was 3 months – 36 months (median, 7 months). Their mean serum urea, creatinine, albumin concentrations, Calcium-phosphate product and PCV at initiation of HD were  $19.8 \pm 6.4$  mmol/L,  $954.2 \pm 465.8$  umol/L,  $34.9 \pm 8.2$  g/L,  $2.7 \pm 1.2$  mmol<sup>2</sup>/L<sup>2</sup> and  $25.25 \pm 6.5\%$  respectively. The values after 3 months of HD were  $15.1 \pm 9.3$  mmol/L,  $599.5 \pm 215.5$  umol/L,  $34.3 \pm 10.1$  g/L,  $2.7 \pm 0.5$  mmol<sup>2</sup>/L<sup>2</sup> and  $26.8 \pm 6.8\%$  respectively. HRQOL improved from a modal score of 60 to 80 after 3 months of therapy. Only 54.5% were able to afford 12 hours of HD per week, 86.4% had parenteral iron therapy but only 50% were able to sustain erythropoietin therapy for up to e"12 weeks. Only 31.6% achieved the K/DOQI target for Hb or PCV, while 50% could not achieve the serum calcium target while 54.5% could not achieve that for phosphate.

**Conclusion:** Maintenance dialysis though beneficial is still largely unaffordable by majority of our patients. There is the need to conduct larger studies with longer follow up in our patients to determine the African or even Nigerian targets.

**Abstract WOR 20:**

**AN ASSESSMENT OF BLOOD ERYTHROPOIETIN LEVELS IN HAEMODIALYSIS PATIENTS ATTENDING ADDINGTON HOSPITAL, DURBAN, SOUTH AFRICA**

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**Background:** Anaemia being one of the most severe complications of end stage renal disease (ESRD) is presently being managed with treatment by recombinant erythropoietin (RHuEPO). Although RHuEPO is routinely administered used levels of erythropoietin is not known in South African population with ESRD.

**Aim:** To Measure and compare erythropoietin levels in haemodialysis (HD) patients receiving RHuEPO or not and healthy controls.

**Method:** Forty haemodialysis patients on RHuEPO therapy and ten haemodialysis patients not on RHuEPO therapy from the Haemodialysis unit at Addington Hospital, Durban, South Africa and ten healthy individuals were recruited to participate in the trial. Blood samples collected monthly for 6 months were centrifuged at 5°C. Plasma was isolated, stored at -20°C and subsequently used in enzyme linked immunosorbent assay (ELISA) to measure erythropoietin level from Roche Laboratory<sup>R</sup>. Comparisons between groups was done using Chi-square test from Instat 3 program(Graphpad<sup>R</sup>)

**Results:** The mean EPO concentration of the healthy male individuals (93.59, ±11.50 mIU/mL) being almost similar in the male HD patients (94.09, ±7.54 mIU/mL) receiving RHuEPO treatment ( $p > 0.05$ ). However, the mean HB levels of the healthy male individuals (15.12 ±0.32 g/dl) was significantly higher than the HD male patients (9.87, ±0.26 g/dl) receiving RHuEPO treatment ( $p < 0.05$ ). Similar observations were recorded in females. EPO concentration in haemodialysis was significantly higher in female (139.42±15.24) than in male patients (119.49±7.54) ( $p = 0.02$ ). No statistically significant difference in EPO concentration was found between patients on RHuEPO and those not receiving RHuEPO.

**Conclusion:** Despite having similar blood levels of erythropoietin than normal control HB level was significantly lower in our haemodialysis patients. This confirms the degree of resistance to erythropoietin in haemodialysis patients previously reported in the literature.

**Abstract WOR 21:**

**A REVIEW OF THE CLINICAL PRESENTATION AND OUTCOME OF HEPATORENAL SYNDROME IN ILE-IFE, NIGERIA**

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**Background:** Hepatorenal syndrome (HRS) is defined as the development of acute onset of renal insufficiency and /or failure in patients with established chronic liver disease (CLD). It's a common cause of intensive care admission in patients with CLD.

**Objective:** To assess magnitude and outcome of HRS in our setting and determine if possible factors contributing to mortality.

**Methods:** The case records of patients managed with chronic liver disease over a six year period (1<sup>st</sup> January 2000 – 31<sup>st</sup> December 2006) were retrieved. Information on socio-demographic data, clinical evaluation, investigation results, duration of admission, treatment and outcome were retrieved and collated.

**Results:** A total 28 patients with established CLD (Liver Cirrhosis and/or primary liver cell carcinoma) had HRS during the period which comprised of 22 (78.6%) males and 6 (21.4%) females with a M:F ratio of 3.7:1. Their ages ranged between 12 and 67 years (mean  $\pm$  SD; 46.9  $\pm$  14.6years). 15 (53.6%) were admitted with hepatic encephalopathy and 18 (64.3%) had clinical ascites which was massive in 10(35.7%) patients. Primary diagnosis was Liver cirrhosis in 22 (78.5%) and Primary liver cell carcinoma in 6(21.5%). Majority had type 1 HRS while only 2 had type 2. Mean values of serum urea and creatinine were 20.5  $\pm$  10.2mmol/L and 604.2  $\pm$  447.6  $\mu$ mol/L respectively. Eighteen (64.3%) had hyponatraemia while only 2 (7.1%) had hypokalaemia. Twenty two (78.5%) patients died between 1 and 67 days of admission while only 2 patients were discharged after 21-34 days of admission. The last 4 discharged against medical advice. The mean ( $\pm$  SD) duration of admission for all patients was 12.6 ( $\pm$  15.1) days. Continuous renal replacement therapy was not available at the time hence could not be offered to the patients.

**Conclusion:** The outcome of hepatorenal syndrome is still very poor. There is the need to explore use of octreotide, midodrine and continuous haemofiltration on a short term as a bridge to liver transplantation which is the definitive treatment.

**Abstract THOR 22:**

**A REVIEW OF RENAL TRANSPLANT LIVING DONORS ATTENDING INKOSI ALBERT LUTHULI CENTRAL HOSPITAL, DURBAN, SOUTH AFRICA**

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**Background:** The shortage of cadaver organs has increased the reliance on living donor related transplants. The incidence of end-stage renal disease is increasing in our population.

**Methods:** This is a retrospective study of kidney donors attending the donor clinic at Inkosi Albert Luthuli Central Hospital. Medical records of 50 donors were examined over a three year period. Mean arterial pressures, creatinine clearances and 24 hr urinary protein excretion collections were recorded at the first visit and at the last visit. The patients' ages and racial demographics were also recorded. Chi-square test using InStat 3 statistical program (Graphpad<sup>R</sup>, San Diego, CA, USA) was used to analyse results.

**Results:** The average age of the renal donor was 44.92 years ( $\pm$ 1.32 yrs). Forty- one of the donors were female and nine were male. The donors were divided in terms of racial demographics as follows: forty Indians, six Whites, two Blacks, and two Coloureds. The average mean arterial pressure at the 1<sup>st</sup> visit was 91.3 mm Hg and was 91.2 mm Hg at the last visit. The average creatinine clearance at the 1<sup>st</sup> visit was 88.1 ml/min. The average creatinine clearance at the last visit was 87.4ml/min. No statistically significant difference was found between the average 24 hour urinary protein excretion at the 1<sup>st</sup> visit (0.16g/24hrs) and at the last visit (0.2g/24hrs). [p =0.16]

**Conclusion:** There was no significant decrease in creatinine clearances nor significant increase in 24 hr urinary protein excretion rates, and mean arterial pressures in the donors within the three year period. Renal organ donation is the most common in females, and the Indians race groups.

**Abstract THOR 23:**

**FIRST RENAL TRANSPLANT IN UCH, 7 MONTHS AFTER**

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**Background:** Chronic kidney disease (CKD) is a global health problem marked by long term and usually irreversible loss of kidney function. In Nigeria, there is a lack of precise data on the burden of CKD but in some studies it is said to account for 2 – 10% of medical admissions and there is growing evidence that it will pose a significant problem in the coming years. Dialysis provides incomplete replacement of lost renal excretory function however Kidney transplantation (KT) is globally adjudged the best alternative treatment for end stage renal disease (ESRD) in preference to life-long dialysis. In Nigeria Kidney transplantation is very much at its teething stages and is presently offered in only 2 hospitals in the country. Only living related transplantation thus far has been done. The University College Hospital had its first living related renal transplant in May 2008.

**Methods:** A case report of the first renal transplant in UCH six months after. The medical report of the patient and relevant literature was reviewed.

**Results:** We report the case of a 32 yr old unmarried Yoruba man who runs a business center in Ibadan and was first referred to our hospital two years ago with a finding of severely elevated BP and elevated serum urea and creatinine. He had an estimated GFR of 5.8ml/min using the Cockcroft – Gault equation. He was anemic, had cardiomegaly and bilaterally shrunken kidneys. He had haemodialysis for a year preceding the surgery. The recipient was HLA haplo identical to his younger sister, the donor. They were both blood group O+ve and lymphocytotoxic cross match was negative. The surgery was well tolerated and he is presently on cyclosporine, mycophenolate mofetil, prednisolone and anti – hypertensives. Three months post – op, he had a urinary tract infection with transient rise of serum creatinine. He subsequently had two more episodes and an episode of malaria each time associated with transient increases in serum creatinine. He has been noted to have complaints attributable to cyclosporine viz hirsutism, hypertension and polycythemia. He is having regular follow up and investigations. Six months after, we are wary of the problems that may still occur such as late acute rejection, late acute calcineurin inhibitor toxicity, cardiovascular Disease, recurrence of the primary disease and side effects of the other drugs.

**Conclusion:** Kidney transplantation is cost effective and offers a good quality of life for ESRD patients. Poverty, inadequate facilities and lack of donors are major problems facing Kidney transplantation in our society. Improvements in short- and long term renal allograft survival have been very encouraging. This reflects multiple influences, including more effective immunosuppression, more use of living donors, and better medical and surgical care. There is a need for more transplant centers in Nigeria with better funding for us to improve the specialist care we offer in this area.

**Keywords:** END STAGE RENAL DISEASE (ESRD), KIDNEY TRANSPLANTATION (KT), DIALYSIS

## HYPERTENSION AND CHRONIC KIDNEY DISEASE

### Abstract TPO 1:

#### IS ROUTINE URINALYSIS USEFUL IN NEW ADMISSIONS INTO THE MEDICAL WARDS?

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**Background:** Routine urinalysis is considered as an essential laboratory investigation in patients admitted into the medical wards of most hospitals in Nigeria regardless of the nature of illness of the patient. This practice holds its root in the believe that routine urinalysis (an inexpensive multiple parameter screening test) may reveal unsuspected co-morbid illnesses in the admitted patient in addition to documenting expected urinary abnormalities in the patient. However, given the heterogeneous nature of the disease conditions of the admitted patients and the non-specificity of the results of routine urinalysis, the usefulness of routinely carrying out the procedure on all admitted patients is doubtful.

**Objectives:** This study examines the usefulness of routine urinalysis in admitted patients by determining the prevalence of abnormal urinary findings in the patients, and reviewing the case notes of the patients on discharge for documented clinical action taken on the urinary abnormality by the managing team. The sensitivity and specificity of glycosuria in the admitted patients was also examined.

**Methods:** One hundred and seventy two patients admitted into the various medical wards of our institution between the 1<sup>st</sup> of June to 31<sup>st</sup> July 2006 were analysed. 32 (18.6%) had abnormal dipstick urinalysis, 35(20.4%) had abnormal urinary sediments. 26 (15.1%) patients had abnormalities in both tests.

**Results:** Proteinuria and significant pyuria were the most common dipstick and urinary sediments abnormalities occurring in 16 (9.3%) and 9 (5.2%) of patients respectively. Sensitivity of glycosuria was 21.4% with a specificity of 98.6%. Urine MCS was requested in three patients with pyuria but no result was obtained by the managing team.

**Conclusion:** We conclude that routine admission urinalysis has limited value in clinical practice as clinical response to abnormal urinary findings are often not pursued.

### Abstract TPO 2:

#### CHRONIC KIDNEY DISEASE IN ADULTS WITH METABOLIC SYNDROME: A COMPARISON OF TWO DEFINITIONS

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**Introduction and Aim:** The burden of chronic kidney disease and other non-communicable diseases is increasing globally. Recent studies suggest that metabolic syndrome may contribute to the development of

chronic kidney disease. This study was undertaken, with the sole aim of determining the prevalence of CKD in subjects with MS as determined by the ATP III and IDF criteria.

**Methods:** 240 consenting adults (18 to 70 years), attending the general out-patient clinic of General Hospital Okrika for various ailments were studied. Subjects were screened for metabolic syndrome as defined by IDF and ATP III. Estimated GFR (eGFR) was determined with MDRD formula and CKD was defined as eGFR less than 60ml/min/1.73m<sup>2</sup>. Data was analyzed using SPSS version 12.0 and Epi info version 4.6; p value < 0.05 was considered as significant.

**Results:** 84 (35.0%) of 240 subjects had metabolic syndrome as defined by NCEP ATP III, while 85 (35.4%) had metabolic syndrome as defined by the IDF definition. The subjects were predominantly females and mean age was between 54.74±15.30 and 55.60±14.81 years. Four of 84 (4.8%) subjects with MS by ATP III had CKD and similarly 3 of 85 (3.5%) subjects with MS by IDF definition had CKD. Amongst subjects without MS by either definition, the prevalence of CKD was 4 of 140 (2.9%). The prevalence of CKD though higher among subjects with metabolic syndrome by ATP III, compared to those with IDF and subjects without metabolic syndrome, the differences were not statistically significant ( $X^2=0.14$ ;  $P=0.710$ ). Comparison of MS subjects without CKD and those with CKD did not show any significant difference in age, waist circumference, BMI, blood pressure, FBG and lipid profile ( $P>0.05$ ).

**Conclusion:** CKD was commoner in subjects with metabolic syndrome compared to those without metabolic syndrome, though the difference was not statistically significant. The prevalence of CKD in subjects with metabolic syndrome in our study population did not differ significantly when the different metabolic syndrome definitions were employed.

### Abstract TPO 3:

#### AUTOSOMAL DOMINANT POLYCYSTIC KIDNEY DISEASE: PRESENTATION OF SIX CASES

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**Introduction and Aim:** Autosomal dominant polycystic kidney disease (ADPKD) is the most common hereditary renal disorder in adults worldwide. Progression to ESRD most commonly occurs in middle age and later. In North America and Europe it is the most frequent genetic cause of renal failure in adults accounting for 6-10% of cases of ESRD. The prevalence of this disease in our environment is not known. We present six cases which were seen in our unit between January and September, 2008, to highlight the need for early detection.

**Methods:** Case notes of these patients were retrieved from the records department and relevant socio-demographic, clinical and laboratory data were extracted for analysis. Data was analyzed with SPSS version 12.0.

**Results:** Six cases were seen over a nine-month period [4 (66.7%) males, 2 (33.3%) females]. Age ranged from 30 to 56 years (mean age 46.17±12.34 years). They were predominantly civil servants 4 (66.7%). The ethnicity of the patients was Ikwere 3 (50%), Igbo 2 (33.3%) and Engeni 1 (16.7%). Two (33.3%) had positive family history of hypertension; 1 (16.7%) had positive family history of ADPKD. Common clinical features were ballotable kidneys (66.7%), peripheral oedema (50.0%), pallor (50.0%) and palpitations (33.3%). Mean systolic BP was 161.67±22.29mmHg; mean diastolic BP was 97.50±14.05mmHg; 5 (83.33%) of the patients had hypertension. Mean right and left renal lengths were 15.57±1.07cm and 13.83±0.84 cm

respectively, while mean right and left renal widths were  $7.73 \pm 0.35$  cm and  $7.57 \pm 1.07$  cm respectively. Four patients (66.7%) were in ESRD with a mean eGFR of 7.6 ml/min. The mean eGFR for all six patients was  $40.83 \pm 57.24$  ml/min. Mean PCV, serum sodium, potassium, bicarbonate, urea and creatinine were  $28.17 \pm 5.91\%$ ,  $129.83 \pm 7.36$  mmol/L,  $4.23 \pm 1.03$  mmol/L,  $21.33 \pm 5.28$  mmol/L,  $18.35 \pm 14.12$  mmol/L and  $600.17 \pm 452.14$   $\mu$ mol/L respectively. Mean serum total protein was  $63.33 \pm 5.69$  g/L and mean serum albumin was  $34.75 \pm 4.27$  g/L. The mean serum total cholesterol, HDL-cholesterol and FBG were  $3.62 \pm 1.93$  mmol/L,  $0.75 \pm 0.19$  mmol/L and  $8.50 \pm 6.35$  mmol/L respectively. Significant gender differences were observed only in serum sodium ( $p=0.004$ ), bicarbonate ( $p=0.003$ ), HDL cholesterol ( $p<0.001$ ) and eGFR ( $p=0.011$ ).

**Conclusion:** Most patients were middle-aged, male, civil servants with hypertension and ESRD at presentation, highlighting the need for early detection through screening programs.

**Abstract TPO 4:**

**CHILDHOOD IDIOPATHIC STEROID RESISTANT NEPHROTIC SYNDROME: MEMBRANOPROLIFERATIVE GLOMERULONEPHRITIS AND FOCAL SEGMENTAL GLOMERULOSCLEROSIS ARE THE PREDOMINANT GLOMERULAR LESIONS IN SOUTHWESTERN NIGERIA**

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**Objectives:** To determine the clinicopathologic characteristics and outcome in children with idiopathic steroid resistant nephrotic syndrome (iSRNS).

**Patients and methods:** A retrospective review of clinical charts of 23 Nigerian children diagnosed with iSRNS between January 2001 and December 2007 was done.

**Results:** Steroid resistance (55%) was primary and secondary in 19 and 4 patients, respectively. Mean age at diagnosis was  $8.3 \pm 3.5$  (2.1 to 13) years; male (16) / female (7) ratio was 2.3:1. The glomerular histopathologic lesions were membranoproliferative glomerulonephritis (MPGN), focal segmental glomerulosclerosis (FSGS), and mesangial proliferative glomerulonephritis in 10 (43.5%), 9 (39.1%), and 2 (8.7%) patients, respectively; minimal change disease (MCD) and membranous nephropathy accounted for 4.35% each. Median tubulointerstitial (TI) score was 2 (0 – 6). Eighteen (78.3%) patients received first line treatment that comprised pulse intravenous (IV) cyclophosphamide infusion, and IV dexamethasone  $\pm$  lisinopril or spironolactone; 3 (13%) received other treatment regimens while two declined treatment (8.7%). Kaplan – Meier survival analysis revealed 57.12% cumulative complete remission (CR) rate. CR was better with MPGN compared to FSGS (Log rank  $p$  value  $< 0.05$ ). TI injury severity correlated poorly with time to CR in FSGS and MPGN ( $r = 0.0522$ ;  $p > 0.50$ ). The overall median time to CR from start of steroid sparing agents in 12 of the 21 treated patients was 4.5 (0.43 - 11.0) weeks. Eight relapses occurred in 5 patients; overall median relapse-free duration was 4 (1.9 – 14) months. Remission was sustained in 3 patients. Cumulative renal survival was poor in 18.0% (eGFR  $< 80$  mL /min/1.73m<sup>2</sup>). The median follow up time was 8 (6 – 58) months.

**Conclusions:** Given the high prevalence of iSRNS and preponderance of non – MCD in this study, we strongly recommend routine renal biopsy for nephrotic Nigerian children. While response to combined steroid and steroid-sparing agents was generally good, it was significantly better with MPGN compared to FSGS.

**Abstract TPO 5:**

**LIPID PROFILE OF PATIENTS WITH CHRONIC KIDNEY DISEASE IN YAOUNDE GENERAL HOSPITAL**

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**Introduction and Objectives:** Chronic kidney disease is a major public health problem world wide. Dyslipidemias are common in chronic kidney disease and constitute not only a progression factor but also a cardiovascular risk factor in patients with chronic kidney disease. The aim of this study was to determine the lipid profile of patients with chronic kidney disease (CKD) seen in the nephrology clinic.

**Methods:** To reach these objectives, we carried out a hospital based retrospective case review over 6 years in the internal medicine -nephrology ward of the Yaoundé General hospital. We excluded all patients who were on lipid lowering drugs at the time of presentation and those on dialysis. A lipid profile was requested at the first nephrology consultation. Total cholesterol, triglycerides and HDL-cholesterol were quantified using enzymatic methods by the hospital laboratory. LDL-cholesterol was calculated using the Friedwald formula. The ANOVA \$ KRUSKAL WILLIS statistical tests were used for multivariate analysis. The threshold for statistical significance was set at  $P < 0.005$

**Results :** A total of 149 patients were seen during the study with 69.1% of them males. The mean age of the population was  $52.01 \pm 10$  years. Hypertension (43.5%), Diabetes (24.8%) and chronic glomerulonephritis (12%) were the principal etiologies of chronic kidney disease. HIV was present in 5.3% and in about 4% the etiology was unknown. Over 62% of these patients were in stage 5 of chronic kidney disease. The prevalence of dyslipidemias were; 44% for hypercholesterolemia ( $>200\text{mg/dl}$ ), 36% for hypertriglyceridemia ( $>130\text{mg/dl}$ ), 40.9% for raised LDL-C ( $>130\text{mg/dl}$ ) and 46.6% for low HDL-C ( $<40\text{mg/dl}$ ). The mean atherogenicity index was  $4.2 \pm 0.3$ , with 36.3% being above 3.5. Age, Sex, Stage of CKD, alcohol and tobacco use, and a past history of a cardiovascular event did not seem to influence the lipid profile. Patients with chronic glomerulonephritis had significantly higher values of total cholesterol ( $P=0.000$ ), triglycerides ( $p=0.02$ ) and LDL-C, ( $p=0.000$ ). Patients above 50 years of age had significantly lower levels of total cholesterol ( $P=0.000$ ), triglycerides ( $p=0.004$ ), LDL-cholesterol ( $P=0.000$ ) and atherogenicity index ( $p=0.004$ ).

**Conclusion:** Our results show that dyslipidemias are common in patients with chronic kidney disease. Chronic glomerular diseases which remain a major cause of CKD and usually associated with significant albuminuria contributes to these lipid abnormalities.

**Keywords:** CHRONIC KIDNEY DISEASE, LIPIDS

**Abstract TPO 6:**

**QUALITY OF SLEEP AMONG HYPERTENSIVE PATIENTS IN A SEMI-URBAN NIGERIAN COMMUNITY: A PROSPECTIVE STUDY**

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**Background:** Sleep complaints are common in patients with chronic medical disorders; however, the prevalence of "poor sleep" in patients with chronic hypertension is not yet known in Nigeria. In the general population, insomnia negatively impacts quality of life. The objective of this study was to examine the quality of sleep among Nigerian hypertensive patients.

**Objective:** The study aimed to measure the prevalence of “poor sleep” in hypertensive patients and to examine the association between quality of sleep and the severity of hypertension in this population.

**Methods:** Quality of sleep was measured using the Pittsburgh Sleep Quality Index (PSQI) in chronic hypertensive patients attending a tertiary hospital in Nigeria. This was compared with normal control subjects.

**Results:** The mean age of the hypertensive patients was  $58.15 \pm 9.65$  years (range, 19–76 years). This did not differ from the controls at  $58.7 \pm 10.8$  years. A total of 80 (60.6%) respondents were females with a mean age of  $58.3 \pm 12.2$  years while 52 (39.4%) were males with a mean age of  $58.8 \pm 11.7$  years. The mean body mass index (BMI) was  $26.42 \pm 4.13$  kg/m<sup>2</sup> (range, 18.9–36.4 kg/m<sup>2</sup>), with 63.1% of the respondents being either overweight or obese. The mean systolic blood pressure was  $167.4 \pm 21.8$  mm Hg (range, 100–210 mm Hg) while the mean diastolic blood pressure was  $96.7 \pm 14.9$  mm Hg (range, 60–130 mm Hg). Fifty-six (42.4%) hypertensive subjects were “poor sleepers” (global PSQI > 5), with a global mean PSQI of  $5.03 \pm 3.28$ . This was significantly more than 17.3% of control subjects, with a mean global PSQI of  $3.10 \pm 0.83$ . Among the hypertensives, there was no statistically significant relationship between the global PSQI and the age ( $P = 0.653$ ), sex ( $P = 0.710$ ), BMI ( $P = 0.253$ ), systolic ( $P = 0.145$ ), and diastolic blood pressure ( $P = 0.827$ ).

**Conclusions:** Poor sleep is common in hypertensive patients and may be associated with lower health-related quality of life. Large-scale, prospective, longitudinal studies on quality of sleep in hypertensive patients are needed to confirm the high prevalence of impaired quality of sleep in this population, and to examine the association between severity of hypertension and quality of sleep while controlling for potential confounding variables. We hypothesize that severity of hypertension directly influences quality of sleep, and poor quality of sleep may worsen hypertensive conditions.

**Keywords:** SLEEP QUALITY; HYPERTENSION; INSOMNIA; NIGERIA; BLACK POPULATION

#### Abstract TPO 7:

#### CASE REPORT – CEREBRAL VENOUS THROMBOSIS IN A CHILD WITH NEPHROTIC SYNDROME

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Nephrotic syndrome is associated with several complications among which are thrombo embolic phenomena. These are uncommon in children.

This report describes an 8 year old male child with relapse of steroid resistant minimal change nephrotic syndrome who developed cerebral sagittal and transverse sinus thromboses.

He presented with headaches, vomiting and photophobia; and developed VI cranial nerve palsy during the course of the illness. Diagnosis was made by Computed Tomographic Scan and Magnetic Resonance Angiography of the brain.

He is being treated with low molecular weight heparin and has recovered without neurological deficits from the venous thromboses.

**Keywords:** NEPHROTIC SYNDROME, STEROID RESISTANT MINIMAL CHANGE, SAGITTAL AND TRANSVERSE SINUS THROMBOSES, LOW MOLECULAR WEIGHT HEPARIN

**Abstract TPO 8:**

**AUTOSOMAL DOMINANT POLYCYSTIC KIDNEY DISEASES PATTERNS IN BLACK AFRICANS: A TEN YEARS RETROSPECTIVE STUDY FROM SENEGAL**

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**Introduction:** Autosomal dominant polycystic kidney disease (ADPKD) is not well described in black Africans. Some previous data suggested the disease is exceptional in this racial group [1,2].

**Patients and Method:** A retrospective and descriptive study of patients with ADPKD followed between 1995 and 2005 in a teaching hospital in Dakar. Diagnosis of ADPKD was based on clinical and ultrasound criteria.

**Results:** Prevalence of ADPKD was one in 250. Mean age was  $47 \pm 5$  year with a predominance of male (57%). High blood pressure (HBP) was present in 68% of patients. Other renal manifestations were flank pain, hematuria and proteinuria. Two third of patients had impaired renal function at time of diagnosis with 15 end-stage renal disease (ESRD) cases. Extra-renal cysts were essentially found in liver (45,5%), pancreas and seminal vesicles. Main complications were ESRD (51%) occurring within a 6 year mean period, urinary tract infection (13%) and cerebral haemorrhage (2%). For the majority of cases, control of HBP required association of more than 2 antihypertensive drugs. Ten patients had been on haemodialysis and four others died from uremia complications.

**Conclusion:** ADPKD in black Africans is not as rare as reported before but probably underdiagnosed. Early HBP and ESRD are likely more frequent than in other races [3]. Presymptomatic ultrasound detection and early nephroprotection strategy should be more proposed to at-risk individuals to improve outcomes.

**Keywords :** AUTOSOMAL POLYCYST KIDNEY DISEASE – BLACK AFRICANS

**Abstract TPO 9:**

**RARITY OF IGA NEPHROPATHY AND MOST IGA ASSOCIATED HLA ALLELES IN BLACK AFRICANS IN KWAZULU-NATAL (SOUTH AFRICA)**

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**Background:** Immunoglobulin A (IgA) associated nephropathy is reported to be one of the most common primary nephropathy worldwide. Various HLA antigens including HLA A33 have been reported to be associated IgA nephropathy.

**Aim:** To investigate the prevalence and association of various HLA alleles commonly associated with IgA nephropathy in KwaZulu-Natal patients according to race.

**Methods:** We have retrospectively investigated the prevalence of various HLA antigens in KwaZulu-Natal patients with IgA nephropathy using the renal database at Inkosi Albert Luthuli Central Hospital. We have

also prospectively performed tissue typing using molecular techniques on patients known with IgA nephropathy. Prevalence of HLA alleles including HLA A2, A33, B12, Bw35, Bw44, Bw54, DR4 reported to be associated with IgA nephropathy elsewhere were reviewed in our patients according to race. Statistical analysis was performed with Instat3 program (Graphpad<sup>R</sup>).

**Results:** While out 98 patients reviewed, IgA nephropathy represented 23 % of glomerulonephritides in Indians, and 25% in Whites, it was not found in Africans (0%). In Africans, the frequencies of selected HLA alleles are as follows: HLA A2(19%), A33 (0%), B12 (1%), Bw35(5%), Bw44(10%), Bw54(0%), DR4(6% ). In KwaZulu-Natal patients, IgA nephropathy was positively associated with HLA-A33 in Indians ( $p < 0.049$ )

**Conclusion:** IgA nephropathy is rare among Africans in KwaZulu-Natal. HLA-A33 a possible disease susceptibility marker for IgA nephropathy in Indians in KwaZulu-Natal is not present in Africans and might be responsible for the rarity of IgA nephropathy in Africans

**Abstract TPO 10:**

**RENAL INSUFFICIENCY AND HEART FAILURE – RISK FACTORS, PATTERN AND OUTCOME IN A TROPICAL PEDIATRIC POPULATION**

*Adekanmbi AF, Ogunlesi TA, Alebiosu CO and Olowu AO*

**Introduction:** In congestive cardiac failure (CCF), renal perfusion and renal dysfunction may affect outcome. The aim of the study was to describe the pattern of renal dysfunction in pediatric patients with CCF and investigate the postulate that the dysfunction is a predictor of morbidity and mortality.

**Methods:** One hundred and four newly diagnosed consecutive hospitalized pediatric patients with CCF admitted over a one year period formed the study population. Renal functions were determined before and after therapy. Correlation was determined using Pearson's correlation coefficient and significant risk factors were determined by multiple regression analysis.

**Results:** There were 51(49.1%) males and 53(50.9%) females. The mean age was 2.0+3.1years with a range of 1day to 14years. The mean duration of disease was 14.89+45.6days. The mean serum levels of Na, K, Urea, HCO<sub>3</sub> and Creatinine were 129.0+55.1mmol/L, 4.0+0.82mmol/L, 47.6+58.9mmol/L 20.5 ?3.8 mmol/L and 0.95 ?1.89 mmol/L respectively. Hyponatraemia, hypokalaemia, metabolic acidosis, elevated urea and creatinine were found among 16(15.3%), 4(3.8%) 24(23%) 32(30.7%) and 3(2.9%) subjects respectively. Twenty seven cases (Case Fatality Rate 25.9%) out of 104 subjects died. There were no significant differences in the mean serum levels of the electrolytes between survivors and the fatalities. Using multiple regression analysis, elevated serum creatinine was a significant risk factor for death in CCF ( $p=0.0388$ ) while hypokalaemia was not ( $p=0.2000$ ).

**Conclusion:** Children with CCF commonly had azotaemia among Nigerian Africans. Serum Creatinine was a risk factor for death.

**Abstract TPO 11:**

**DISTRIBUTION OF ULTRAFILTRATION, AND ITS EFFECT ON WEIGHT AND BLOOD PRESSURE IN PATIENTS UNDERGOING HAEMODIALYSIS AT UNIVERSITY OF PORT HARCOURT TEACHING HOSPITAL, PORT HARCOURT**

*Okafor UH, Eneyo WS, Chinda IN, Fibriesima AJ, Odidi VI and Wokoma FS*

**Objectives:** To determine the frequency of ultrafiltration, and its effect on the patient's weight and blood pressure.

**Materials and Methods:** This is a retrospective study. The medical records of patients presenting for haemodialysis at renal unit of UPTH Portharcourt from 1<sup>st</sup> January to 30<sup>th</sup> June 2008 were retrieved. The biodata, ultrafiltration volume, predialysis weight, post dialysis weight, pre dialysis BP, post dialysis BP were retrieved. The mean UF, pre dialysis weight and BP, post dialysis weight and BP were computed. The difference between the pre and post dialysis parameters was documented. The data obtained were entered into a spread sheet, and then analysed using SPSS Vs 13.0.

**Results:** Forty patients were dialysed during the period under study. Twenty one patients (72.5%) had ultrafiltration. The ultrafiltration volumes were  $\leq 1000$ ml in 22.5% patients and  $> 3000$ ml in 30% of patients. Patients with ultrafiltration volume of  $\leq 1000$ ml lost 0.65kg, and patients with ultrafiltration volume  $> 4000$ ml lost 5.0kg. p value was 0.046. The change in systolic blood pressure was -3.5mmHg in UF  $\leq 1000$ ml and -30.0mmHg in UF  $> 4000$ ml, p value was 0.177. The diastolic blood pressure was 3.0mmHg in UF  $\leq 1000$ ml and -10mmHg in UF  $> 4000$ ml. p value is 0.506.

**Conclusion:** Most of the patients presenting for haemodialysis are usually fluid overloaded and this accounts for the high frequency of ultrafiltration. Ultrafiltration causes reduction in weight of patient but does not affect the blood pressure significantly.

**Abstract TPO 12:**

**PATTERN OF RENAL DISEASE AMONG PATIENTS WITH CHRONIC RENAL FAILURE – A 4 YEAR REVIEW**

*Okafor UH, Onwuchekwa UN, Unuigbo EI and Ojogwu LI*

**Objectives:** To highlight the pattern of renal disease in patients who died from chronic renal failure.

**Material and Patient:** This is a retrospective study. The case files of CRF patients who died between 1<sup>st</sup> January 2002 and 31<sup>st</sup> December 2005 were retrieved and medical details of the patients were recorded and analysed using SPSS Vs 13.0.

**Results:** A total of 87 patients died within the period under study (2002 – 2005). Fifty-nine (67.8%) were males; the mean age was  $42.5 \pm 16.4$  years. Students, traders, and civil servants were the most affected. Uraemic encephalopathy and pulmonary oedema were the commonest clinical presentation. Chronic glomerulonephropathy and hypertensive nephrosclerosis were the commonest kidney disease. There is increasing age of patients dying from CRF within the period under study, 37.7years in 2002 and 45.5 years in 2005.

**Conclusion:** The burden of CRF is more in young adult, low socio-economic status and the males. CGN and hypertensive nephrosclerosis remains the commonest cause of CRF in our population.

**Abstract TPO 13:**

**RATIONALE FOR CYTOTOXIC CHEMOTHERAPY IN NEPHROTIC SYNDROME IN ABSENCE OF PATHOLOGICAL DIAGNOSIS**

*Okafor UH, Wokoma FS, Emem- Chioma P, Okojaja A R, Bell – Gam H and Alasia DD*

**Objectives:** To highlight the use of cytotoxic chemotherapy in nephrotic syndrome in absence of pathological diagnosis.

**Case Summary:** A 21 years old man admitted in nephrotic syndrome with gross ascites and oedema affecting the lower limbs, forearm, sacral, anterior abdominal wall, trunk and facial. Investigations were consistent with nephrotic syndrome. He was commenced on diuretics, lisinopril, antiplatelet but there was no significant response. He also did not respond to haemofiltration, salt poor albumin and later prednisolone. He was later commenced on cytotoxic therapy to which he had prompt and remarkable response.

**Conclusion:** In the absence of pathological diagnosis in diuretic and steroid resistant nephrotic syndrome, cytotoxic chemotherapy can be tried if there is no contraindication.

**Abstract TPO 14:**

**“FULL HOUSE” COMPLICATIONS OF TYPE 2 DIABETES IN A NIGERIAN WOMAN :  
CASE REPORT**

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The challenge of management of a 64 year old Nigerian woman with type 2 diabetes, severe hypertension and nephrotic proteinuria with normal kidney function is presented. Prior to review, she had undergone bilateral laser photocoagulation for proliferative retinopathy. After 4 years of follow up, she developed associated heart disease and left hemiparesis from cerebrovascular disease with brain scan revealing massive right hemispheric infarct. Nevertheless, she remained fully conscious and well aware. Her kidney histology showing diffuse glomerulosclerosis and vascular disease involving both the afferent arteriole and large renal artery is also presented. The need for multidisciplinary/multicentre collaboration for effective evaluation and management is also highlighted.

**Abstract TPO 15:**

**KIDNEY DYSFUNCTION IN PATIENTS WITH SICKLE CELL DISEASE (SCD): A  
RETROSPECTIVE REVIEW**

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**Background:** Sickle cell disease (SCD), a disease of blacks often presents with disabling acute complications which could be occasionally fatal. Its renal manifestations are increasingly being recognized as affected patients now survive to middle and rarely old age. Reports on kidney dysfunction in SCD in our environment have focused mainly on tubular abnormalities hence this retrospective review.

**Aim & Objectives:** We retrospectively reviewed our SCD patient population with a view to uncovering the major renal manifestations and its predictive factors. We also attempt to ascertain the contributions of renal disease to mortality.

**Materials and Methods:** We reviewed the available case records of SCD patients managed in our hospital. Information on age of patients, age at diagnosis, number and types of crises, number of units of blood transfusions received and presence of uraemic features or frothiness of urine were retrieved. Investigation results ranging from urinalysis, serum chemistry, urine microscopy, serological status and clinical outcomes were also collated. Renal disease was defined as elevated serum creatinine above 132  $\mu\text{mol/L}$  and / or presence of at least 1+ proteinuria on dipstick. Data was analysed using SPSS package version 13.

**Results:** A total of 376 case records were reviewed but only 374 (99.46%) had complete data. Their ages ranged between 7 and 62 years (Median; 23 years) (Mean  $\pm$  SD; 24.16  $\pm$  7.57yrs), There was a slight female preponderance with 189 (50.5%) of them being females. Age at diagnosis of SCD ranged between 3 months and 31 years (median ; 4 years). The median number of crises was 6 (range 1-37 episodes). 294 (78.6%) had HbSS while 77 (20.6%) had HbSC and only 2 (0.5%) had HbCC disease. There was no relationship between the genotype and propensity for renal disease ( $p=0.467$ ). Systolic and diastolic blood pressures ranged between 60-190 mmHg and 30-130mmHg respectively, only 10 patients had hypertension, 4 had both systolic and diastolic HT while 2 and 4 patients had isolated systolic and diastolic HT respectively. 257 (68.7%) had no evidence of renal disease while the remaining 117 (31.3%) had either proteinuria or elevated serum creatinine or both. 63 (16.8%) had proteinuria, 42 (11.2%) had a combination of proteinuria and elevated serum creatinine while the remaining 12 (3.2%) had isolated elevation of serum creatinine. 4 of the patients were HBsAg positive out of which only 2 had renal disease, only 1 had anti HCV antibodies and only 1 was HIV positive ( $P>0.5$ ). The ages of patients was a significant predictor of kidney disease being significantly higher in patients with kidney disease ( $P=0.002$ ) while the age at diagnosis was not significantly different. The PCV was significantly lower in those with kidney disease while the ESR was significantly higher in them. Patients with kidney disease had significantly higher number of crises / hospitalisations. Seven patients died in all and 4 (75%) of them had end stage renal disease (Fisher's exact test,  $P=0.000$ ).

**Conclusion:** Kidney disease is a common complication of SCD and significantly contributes to mortality. Age of the patients and/or duration of SCD are a strong predictors of development of kidney disease.

#### **Abstract TPO 16:**

### **MULTIPARAMETRIC ASSESSMENT OF THE NUTRITIONAL STATUS OF A SAMPLE OF NIGERIAN PATIENTS WITH CHRONIC KIDNEY DISEASE**

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**Background:** The nutritional status of patients with chronic kidney disease is an important determinant of the morbidity and mortality associated with the disease. In the absence of a cure for chronic kidney disease, one of the major aims of treatment is to improve the functional status and quality of life of affected patients. The nutritional status of our patients with chronic kidney disease and the best nutritional assessment tool remain largely undetermined.

**Objectives:** The study evaluated the baseline nutritional status of a sample of patients with chronic kidney disease using several parameters. The ability to detect malnutrition using the various nutritional assessment tools was compared.

**Materials and methods:** A total of 62 consecutive patients with chronic kidney disease being treated at the renal unit of National Hospital, Abuja were enrolled into the study. Nutritional status was assessed by the use of Subjective global assessment (SGA), a tested and verified nutrition assessment tool. Other objective nutritional parameters used include weight change over six months of follow up, Body Mass Index (BMI), Triceps skin fold thickness (TSF), mid upper arm circumference (MUAC) and Serum Albumin. Data obtained were analyzed using the EPIINFO 6.04 integrated statistical software for health and epidemiological research.

**Results:** Malnutrition was seen in more than 54% of the patients studied based on SGA criteria, 41.9% based on weight loss over six months, 48.4% based on MUAC, 17.7% based on BMI, 85.5% based on TSF, 24.2% based on Serum Albumin and 69.4% based on two or more criteria. The serum albumin underestimated patients with malnutrition when compared to the SGA.

**Conclusion:** The incidence of malnutrition in our patients with chronic kidney disease is high. Efforts at detecting early malnutrition, as well as correcting factors associated with malnutrition in such patients, will hopefully improve their functional status.

## ACUTE RENAL FAILURE AND TOXIC NEPHROPATHIES

### Abstract TPO 17:

#### ACUTE RENAL FAILURE IN HIV – AN OUTCOME STUDY

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**Background:** HIV positive patients who develop severe acute or acute on chronic renal failure often require intensive care and a renal biopsy to determine the cause and prognosis of renal failure. The requirement for dialysis therapy heralds a poor prognosis.

**Objectives:** To describe the presentation, renal diagnoses and outcome of HIV positive patients who have undergone acute haemodialysis therapy for severe renal failure at Groote Schuur Hospital in the period 2002 – 2007.

**Methods:** Retrospective review of case notes and laboratory results of HIV positive patients who were dialysed acutely for renal failure.

**Results:** One hundred and seventeen patients were reviewed with a mean age of 36.1 +/- 11yrs (Range 16 - 75). There were 53.8% males and 93.2% were Black African patients. Mean CD4 count was 123 +/- 138 (Range 3-574) and mean creatinine at the start of haemodialysis was 1021+/-478 umol/l (Range 162 – 2607umol/l). A clinical diagnosis of ATN was made by a nephrologist in 68 patients (58.1%). There were 59 cases of sepsis causing ATN. Rhabdomyolysis, gentamycin toxicity, tumour lysis syndrome, and HELLP syndrome caused ATN in the 9 other patients. A histological diagnosis of HIVAN was made in 22 out of 33 patients. Concurrent histological findings of malignant hypertension, renal TB, glomerulonephritis, ATN, acute interstitial nephritis, pyelonephritis and CMV interstitial nephritis were found in ten cases of HIVAN.

Other biopsy proven diagnoses were glomerulonephritis, ATN, malignant hypertension, acute interstitial nephritis, diabetic glomerulosclerosis, and renal lymphoma. The renal diagnoses remained uncertain in 16 patients. The average length of stay in hospital was 16.8 days with an average of 9 dialysis dependant days. Fourty-eight patients (41%) died during hospitalization. Thirty patients (26.5%) remained dialysis dependant at discharge. Thirty nine patients (33.3%) survived the hospital period and were considered independent of dialysis at discharge.

**Conclusions:** HIV patients who need acute dialysis therapy have an overall poor prognosis. ATN due to sepsis, especially with advanced AIDS causes the greatest burden of disease and is a predictor of poor outcome in this group. HIVAN is a histological diagnosis that can occur concurrently with other acute and chronic insults to the kidney. A renal biopsy is indicated in severe renal failure when the diagnosis of ATN is in doubt.

**Abstract TPO 18:**

**REPEAT EPIDEMIC OF DIETHYLENE GLYCOL POISONING AMONG NIGERIAN TODDLERS – IBADAN EXPERIENCE**

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**Introduction:** The first episode of diethylene glycol poisoning (DGP) in Nigeria was reported in Ibadan among toddlers who ingested paracetamol syrup that was constituted with diethylene glycol in 1991. The same error has recurred with a teething mixture resulting in many toddlers presenting in acute kidney failure between October and November 2008.

**Aims and Objectives:** To highlight the peculiar clinical features, management difficulties and outcome of acute kidney failure following DGP at the University College Hospital Ibadan.

**Methodology:** All patients who were admitted in our centre with anuria and who had positive history of ingestion of “My Pikin” teething powder were studied. The clinical evaluation, biochemical and haematological investigations, and other management of the patients are reviewed.

**Results:** Thirteen patients, 8 boys and 5 girls, age range 4-36 months, mean 13.8± 6.9 months presented at Otunba Tunwase Children Emergency Ward, University College Hospital, Ibadan; one was brought in dead, two refused admission because of lack of peritoneal dialysis (PD) fluids, and 10 were admitted. All the children presented with fever and anuria, the duration of the anuria ranged from 2 -7 days. Other common features were vomiting, hepatomegaly and encephalopathy. Cough, respiratory distress and hypertension were also notable features. They were all in renal failure on admission. Elevated anion gap metabolic acidosis was present in all. Intravenous ethanol was given to two patients as the preferred fomepizole was not available. Only seven patients were dialysed as two were discharged against medical advice because of lack of PD fluids and another one died before the items for dialysis could be assembled. Their dialysis cycles ranged from 5-72 with 4 patients making urine and having significant reduction in the urea levels but the seven eventually died. The terminal events were encephalopathy and respiratory failure. Investigations were hampered by lack of electric power supply during that period.

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**Conclusion:** The outcome of diethylene glycol poisoning is affected by the quantity ingested, the prompt use of the antidote and haemodialysis. The late presentation of the patients, non-availability of appropriate antidotes and lack of facilities for haemodialysis resulted in very poor outcome. Policies should be put in place so that this error does not reoccur.

## DIALYSIS AND TRANSPLANTATION

### Abstract TPO 19:

#### HAEMODIALYSIS EXPERIENCE IN RETROVIRAL POSITIVE RENAL DISEASE PATIENTS: A PRELIMINARY REPORT FROM BENIN CITY, NIGERIA

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**Background:** In the developed parts of the world renal disease patients, regardless of their retroviral status, have always been granted ready access to haemodialysis (HD) therapy when needed. However, in the Nigerian setting, prior to the commencement of Government sponsored Highly Active Antiretroviral Therapy (HAART) to retroviral positive patients in June, 2003, those needing dialytic therapy were usually denied access to HD. Haemodialytic therapy to such patients only became available in our centre (UBTH) from January, 2007 and our experience with such patients, in terms of patient characteristics and outcome, is here presented.

**Methods:** The case records of all patients who had HD over a 20 month period, beginning from January 2007, were reviewed. Data sought for analysis included biodata, retroviral disease status, clinical and laboratory data.

**Results:** A total of 73 retroviral disease (RVD) patients (32M, 41F) had HD therapy over the period, representing 19.47% of all dialysed patients (375). Fourteen (19.18%) of these RVD patients had acute renal failure while the others were dialysed because of chronic kidney disease (CKD) related uraemia. Patients had a mean age of  $39.22 \pm 10.82$  yrs and PCV of  $21.06 \pm 4.96\%$ . Mean Systolic BP was  $145.74 \pm 25.39$  mmHg while Diastolic BP was  $88.03 \pm 14.92$  mmHg. The number of HD sessions/patient ranged from 1-19. Only 2 patients received a minimum of 2 HD sessions / wk beyond a 4 week period. During the period under review, 4 patients (5.48%) were confirmed still alive, 21 dead (28.77%) and others were lost to follow up. The observed drop out rate from HD was not much different from that seen amongst retroviral negative patients.

**Conclusion:** A high percentage of retroviral positive Nigerians requiring RRT are unable to afford adequate HD on the long term, with the attendant high mortality. However, on a short term basis, there is no strong evidence as yet to justify any adoption of a differential approach, with regard to HD access, between retroviral positive patients on HAART and retroviral negative patients.

### Abstract TPO 20:

#### RENAL OSTEODYSTROPHY AMONG SENEGALESE PATIENTS ON HAEMODIALYSIS

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**Introduction:** Renal osteodystrophy (RO) or chronic kidney disease-mineral and bone disorders (CKD-MBD) is a worldwide challenge for hemodialysed patients. In Senegal, prevalence and incidence of dialysed

patients are increasing but a few data are available about their bone disorders. Our aim was to describe patterns of RO in Senegalese dialysed patients.

**Patients and Method:** We performed a retrospective study including all patients who had been dialysed in our centre from february 1988 to march 2008. Clinical, biological and radiological data and dialysis parameters were collected from records.

**Results:** Prevalence of overall CKD-BMD was 45 % (n=57 patients). Mean age of patients was 48.3 years (20 – 70 years) and sex-ratio M/F was 1.35. Mean duration on hemodialysis was 45 months (04-180 months). The majority of patients had any medical insurance. Secondary hyperparathyroidism was the most frequent disorder followed by adynamic bone disease and osteomalacia. The main clinical, biological and radiological findings are represented in table I.

**Table 1:** Manifestations of different types of renal osteodystrophy

	HPT (n=40)	ABD (n=16)	OM(n=01)
Clinical manifestations			
- Bone pain	06	03	01
- Pruritus	11	09	01
- Peripheral neuropathy	10	02	00
Biological manifestations (mean values and extremes)			
- Calcemia (mg/l)	86 (76-92)	90 (88-97)	89
- Phosphoremia (mg/l)	2.25	1.98	1.53
- Alkaline phosphatases (UI/l)	250 (142.5-616)	120 (40-290)	35
- Parathormone level ng/l	684 (547-793)	60.5 (27-172)	98
- Hemoglobine	8.9 (5.8-11.6)	10.2 (6.5-12)	9.8
Radiological abnormalities			
- Fractures	02	02	00
- Diffuse demineralisation	14	06	01
- Subperiostal resorption	03	00	00
- Extrasketal calcifications	03	02	00

*HPT= hyperparathyroidism; ABD= adynamic bone disease; OM= osteomalacia*

No bone biopsy was performed because histomorphometry was not available in our country. Management of HPT included optimisation of dialysis parameters (100% of patients), calcium phosphate binders (65% of patients), sevelamer (04%), lanthanum (02%), and 1-alpha-calcidol ( % of patients) while treatment of ABD and OM relied on calcium phosphate binders (50% of patients), oral vitamine D analogs (02%). Three patients with HPT required surgery. Evolution was favourable for the majority of patients. However, the K/DOQI recommended levels calcemia, phosphatemia and PTH were not achieved in one third of patients. Three patients died from cardiovascular events.

**Conclusion:** Renal osteodystrophy is frequent and dominated by high turn-over disease in our hemodialyzed patients. Clinical and paraclinical manifestations are often not specific and long term treatment is difficult in context of patients with low economic incomes.

**Keywords:** RENAL OSTEODYSTROPHY, HEMODIALYSIS, SENEGAL.

**Abstract WPO 21:**

**MANAGEMENT AND OUTCOMES OF VASCULAR ACCESS FOR HAEMODIALYSIS IN SENEGAL**

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**Introduction:** Good vascular access (VA) is an imperative for hemodialysis practice. Currently, different VA are available for patients but they can sometimes expose to life-threatening complications. The objective of our study is to describe clinical patterns of VA of patients undergoing chronic hemodialysis in Senegal.

**Patients and method:** A descriptive study of hemodialysed patients from January 1997 to May 2007 at the three main dialysis centre in Dakar. Data about patients and their VA was collected from medical dialysis records. Statistical analysis was done with Epi info 6.0.

**Results:** We included 68 patients. Mean age was  $51.6 \pm 12$  years (24-76 years) and sex ratio 1.17. The primary VA used for first dialysis was a temporary catheter in 82 % of cases and native arterio-venous fistula for 18 % of patients. Mean duration of the first central venous catheter was  $53 \pm 14$  days (7-182 days). Prevalence of infectious complications was 6.5 and 0.6 per 1000 days-patients respectively for temporary and permanent VA. Femoral position (OR = 1.012;  $p = 0.003$ ) and duration of catheter (OR = 1.85 ;  $p < 0.001$ ) were associated with high risk of infection. Other complications of VA were thrombosis (2.2 per 1000 days-patients) and local bleeding (1.5 per 1000 days-patients). Three deaths were directly imputable to VA (2 cases of severe sepsis and 1 compressive neck hematoma).

**Conclusion:** Good management of vascular access is a key point for dialysis quality. First hemodialysis is not scheduled for the majority of our patients because of late referral to nephrologists and initial VA is generally a temporary catheter placed in emergency. Main complications are infections and thrombosis.

**Keywords :** VASCULAR ACCES, HEMODIALYSIS, SÉNÉGAL

**Abstract WPO 22:**

**QUALITY OF LIFE (QOL) IN AMBULATORY HAEMODIALYSIS (HD) AND PERITONEAL DIALYSIS (PD) PATIENTS IN GROOTE SCHUUR HOSPITAL SOUTH AFRICA USING THE KDQOL-SF 1.3 QUESTIONNAIRE**

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**Background:** Haemodialysis (HD) and peritoneal dialysis (PD) are important renal replacement treatment in end stage renal disease (ESRD). The comparison of quality of life (QOL) between these two modalities in Africa is lacking. Therefore, we compared the two modalities in a single-centre study.

**Methods:** Demographic information and biochemical variables were obtained from consenting HD and PD subjects attending the GSH Dialysis units. The KDQOL-SF 1.3 questionnaire which includes 43 kidney-disease targeted items as well as 36 items that provide a generic core and an overall health rating item was administered to the subjects. Responses obtained from the tool were graded and scored and an ESRD-related QOL score, an SF-36 QOL score and a total QOL score were obtained from each subject. Statistical analysis of the data was performed with the SPSS statistical software (version 10.1).

**Results:** Although QOL scores were higher in PD subjects, there was no difference in ESRD, SF-36 and total QOL scores between HD and PD subjects. Total QOL score in all the subjects was inversely and significantly correlated with smoking ( $p=0.045$ ), number of medications taken ( $p=0.007$ ) and occupation ( $p=0.007$ ). ESRD-related QOL score in HD patients was also inversely and significantly correlated with serum phosphate ( $-0.526$ ;  $p=0.036$ ) and the calcium x phosphate (CXP) product ( $-0.586$ ;  $p=0.017$ ). In PD patients, total QOL score inversely correlated with previous history of transplantation ( $-0.0651$ ;  $p=0.022$ ) and occupation ( $-0.0596$ ;  $p=0.041$ ). These results were comparable to a recent similar study in North America.

**Conclusion:** The KDQOL-SF 1.3 questionnaire has shown no significant difference in QOL between South African HD and PD patients. However, to improve the overall QOL in the dialysis population, factors such as hyperphosphataemia, high CXP and number of medications used in patient treatment will require attention. Our findings suggests that PD is a practical dialysis option in the developing countries of Africa where there are serious financial constraints to carry out haemodialysis.

**Abstract WPO 23:**

**POST RENAL TRANSPLANT POLYCYTHEMIA : A REPORT OF 2 CASES AND REVIEW OF LITERATURE**

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**Background:** Post transplant polycythemia or erythrocytosis (PTE) is increasingly recognized as a complication of kidney transplantation. Post transplant erythrocytosis is defined as hematocrit above 51% in transplant recipients. It is a well recognised condition with multiple aetiologies affecting 10 to 17% of patients with excellent allograft function and occurs predominantly during the first 3 years after transplant. In our follow up of ten transplant patients in the University College Hospital, Ibadan PTE has been diagnosed and is being managed in one.

**Methods:** A report of 2 patients presenting with post renal transplant polycythaemia in UCH. The medical report of the patient and relevant literature was reviewed.

**Results:** We report 2 cases of post transplant erythrocytosis in a 34 year old patient who developed post transplant erythrocytosis 6 months after successful transplant, his hematocrit rose to 57% with rising urea and creatinine. With the reduction of his dose of cyclosporine, addition of angiotensin converting enzyme inhibitor, optimal blood pressure management and serial phlebotomies, his packed cell volume (PCV) reduced to 41%, urea returned to normal range (35mg/dl) and his creatinine dropped from 2.7mg/dl to 1.0mg/dl.

**Conclusion:** With the proposed increase in renal transplant rates across the country, Post renal transplant polycythemia is a complication to look out for especially in those on cyclosporin like our patient. This will prolong allograft survival and improve outcomes generally.

**Abstract WPO 24:**

**SHOULD ANTIHYPERTENSIVE DRUGS BE ADMINISTERED PRE-DIALYSIS TO MAINTENANCE HAEMODIALYSIS PATIENTS?**

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**Background:** Haemodialysis induced hypotension is quite common with acetate dialysis on account of which antihypertensive administration pre dialysis is usually discouraged. Hypertension on the other hand used to be rare on acetate dialysis and complicates only 3% of HD sessions in our series. Since commencement

of bicarbonate dialysis in our centre 6 years ago the prevalence of dialysis induced hypertension had steadily increased.

**Objective:** To determine the pattern of occurrence of hypertension as well as its variations during the course of HD.

**Methods:** The data retrieved from patients dialysed between 1<sup>st</sup> January 2007 to 31<sup>st</sup> December 2007 were reviewed. Patients that had HD for longer than 3 months were selected and pattern of blood pressure changes in them studied.

**Results:** A total 105 patients had 664 sessions of HD during the period. Twelve of them had dialysis sessions for longer than 3 months accounting for 11.43%. Ten of these patients were recruited and the pattern of blood pressure changes during dialysis studied. Nine of them had a rise of between 10 - 30mmHg in systolic BP while the rise in diastolic BP ranged between 5 - 15mmHg. Two of the patients had parenteral antihypertensive for symptomatic hypertensive encephalopathy. One patient reverted back to normotension without therapy.

**Conclusion:** Dialysis induced hypertension is common in maintenance HD patients on bicarbonate dialysis. Routine pre-dialytic administration of antihypertensive drugs should be encouraged in such patients.

**Abstract WPO 25:**

**THE CHALLENGES OF RENAL REPLACEMENT THERAPY IN A POOR SOCIETY: THE AHMADU BELLO UNIVERSITY TEACHING HOSPITAL EXPERIENCE, ZARIA**

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**Introduction:** Ahmadu Bello University Teaching Hospital is situated in the Guinea Savannah region of Northern Nigeria. Poverty rate is high with over 60% of the population living on less than \$1 a day. Severe renal failure is not uncommon in the region and renal replacement therapy is the only viable option for improving the clinical outcome in these patients. Haemodialysis and peritoneal dialysis were made available in A. B. U. Teaching Hospital in November 2005. These services are very expensive and a session of haemodialysis costs about \$150. Only very few people can afford long term maintenance haemodialysis at this cost. Renal transplant services are only available in very few centers within the country but donors are hardly available and the cost is also beyond the reach of even the above average in the society.

**Objectives:** The objective of this paper is to look at the service in A. B. U. Teaching Hospital and evaluate the extent to which clinical outcome of patients has improved and possible factors that impede the service.

**Methods:** Records of all patients referred to the nephrology unit during the period of 1<sup>st</sup> January 2006 to 31<sup>st</sup> December 2008 were reviewed. Those noted to have required renal replacement therapy were selected for analysis.

**Results:** Three hundred and fourty six persons were found to have had severe renal failure that required renal replacement and were offered the options available. Only 138 patients (39.8%) accepted to start therapy. All 138 patients preferred to start with Haemodialysis. Ninety six (63.4%) that started dialysis dropped out of the program within three months of starting, mainly due to lack of money to continue. Fourty two patients dialyzed for more than three months but only 12 have dialyzed for more than one year. Two hundred and eight persons could not have dialysis because they could not afford the cost of starting the procedure. Only 4 patients have had transplant because of the difficulty of raising enough funds for the

transplant and the difficulty of getting suitable donors. Almost all our patients presented late to hospital, making planned dialysis impossible. All were taken in on emergency requiring temporary vascular access and burdened with complications and co morbidity that affected clinical outcome. The major co morbidities were cardiovascular diseases such as hypertension, cardiac failure, cerebrovascular disease and diabetes. Frequent breakdown of equipment with delays in repairs had a negative impact on the overall outcome.

**Conclusion:** We conclude that poverty, late presentation, high cost of service, inadequate machines and lack of adequately trained technical manpower negatively impact on renal replacement therapy in A. B. U. Teaching Hospital Zaria. This diminishes the expected improvement in the clinical outcome. Prevention therefore remains the best option for the poor countries to tackle the problem of end stage renal disease.

**Keywords:** HAEMODIALYSIS, HIGH DROP OUT RATE, LATE PRESENTATION, POOR OUTCOME, POVERTY, PREVENTION

**Abstract WPO 26:**

**ANAEMIA RESPONSE TO INTRAVENOUS IRON THERAPY IN HEAMODIALYSIS PATIENTS: A REVIEW OF 20 CASES**

*Babalola EAO and Adeleke TA*

**Background:** Anemia is present in the great majority of patients with chronic renal failure. It has been noticed that most hemodialysis patients have hematocrit of less than 25% (15-24%) whereas hematocrit values above 25% in dialysis patients is generally preferable. Different factors have been associated with this whilst different approaches have been used to combat it including the use of intravenous iron therapy.

**Objectives:** To determine anemia response to intravenous iron therapy.

**Methods:** A six week cross-sectional study of 20 patients who presented with chronic renal failure was carried out at the University College Hospital, Ibadan. Blood sample for hematocrit were taken before intravenous iron and at the end of 6 doses of intravenous iron which was administered at weekly visit.

**Results:** The mean hematocrit value at presentation was 22.7% while the mean hematocrit value after intervention like blood transfusion and administration of erythropoietin was 23.9% and 25.3% respectively. The mean hematocrit value after the administration of 6 doses of intravenous iron was 29.2%

**Conclusion:** The result obtained in this study suggests that administration of intravenous iron helps keep the hematocrit of patients having hemodialysis in a preferable range for the procedure.

**Abstract WPO 27:**

**INTRA-DIALYSIS COMPLICATIONS AND EVENTS AT THE OWENA DIALYSIS CENTER, UNIVERSITY COLLEGE HOSPITAL, IBADAN**

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**Background:** Hemodialysis remains the recommended treatment modality for end stage renal disease. Complications and events may arise during this procedure which may add to the morbidity and mortality of the condition, some of which may be unrelated to the procedure but still influence the outcome.

**Aim:** To determine intra-dialysis complications and events in CRF patients undergoing dialysis at the University College Hospital, Ibadan, highlighting related factors.

**Methodology:** Prospective record of information on patients having haemodialysis in the Unit between September 2006 and August 2007 were documented including age and sex, clinical diagnosis, presence of co-morbidities, level of consciousness, blood pressure at start of procedure, biochemical parameters and hematocrit. Data was analyzed using SPSS version 15, and a p value <0.05 was considered statistically significant.

**Results:** Three hundred and seventy eight patients on dialysis were seen during the period. The mean age was 43.5 years (SD = 19.0). There were more males (68.3%) than females (29.4%). Approximately 75% had chronic renal failure, 20.6% acute renal failure while 3.2% had acute on chronic renal failure. About 71.4% had no co-morbidities. The commonest co-morbidity was diabetes mellitus (11.4% patients), HIV infection (8.5%), malignancy (2.4%), liver disease (1.3%), hepatitis B infection (1.1%), congestive cardiac failure (0.85%), and sickle cell disease (0.3%). Vomiting was the commonest complication (15.1%) followed by hypotension (11.8%), rigors (9.8%), cardiac arrest (4.6%), pyrexia (4.2%), agitation (3.4%), chest tightness (2.1%), convulsions (1.6%), clotted cannula (0.8%) urticaria and ruptured dialyzer (0.3% respectively). There was a significant association with the development of hypotension of the following: presence of a co-morbidity, level of consciousness and number of times of dialyzer reuse. Those more likely to develop hypotension were those with ARF, co-morbidities, first dialyzer users, and those with lower levels of consciousness.

**Conclusion:** Vomiting and hypotension are the commonest intra-dialysis complications from this study, and it is recommended that patients with ARF, co-morbidities and those using a dialyzer for the first time should have prophylactic measures against hypotension instituted prior to, and during dialysis.

**Abstract WPO 28:**

**NURSING CARE PLAN OF TRANSPLANTED PATIENTS IN  
O.A.U.T.H.C., ILE-IFE**

*Fajobi AO, Oshikoya TA, Olarinoye OF and Akoma IE*

**Introduction:** Between 2002 till date eight (8) patients have been transplanted in Obafemi Awolowo University Teaching Hospital Complex. The Nursing problems identified in all of them are similar. We highlighted these problems to guide development of indigenous nursing care process. Presented are the Potential Nursing diagnosis identified in the eight patients, actual nursing problems, nursing intervention carried out the outcome.

**Methodology::** The nursing care plan was developed for these problems:

1. Potential for Post Operative bleeding.
2. Potential for Fluid Overload/Dehydration
3. Potential for Electrolyte Imbalance.
4. Potential for Problems of immobility: Chest infection, Pressure Sore, Deep Vein Thrombosis leading to pulmonary embolism.
5. Risk for Infection due to Surgery Indwelling Catheter CVP line and immunosuppression.
6. Risk for Graft rejection.
7. Potential for Inadequate Nutrition.

**Results:** The Actual Problems observed in the patients are Fluid Overload 2 (25%), Delayed Graft function/ Graft rejection 3 (37.5%), Urine leakage 1(12.5%), Glycemic Instability 1(12.5%), Infection 2 (25%)

Anxiety (due to delayed graft function) 2 (25%), Anxiety (due to inability to sustain treatment) 4 (50%) and Depression (Psychosis) in 1 (12.5%) patient.

**Conclusion:** In planning nursing care for renal transplant patients, the following must be anticipated in view of the prevalence observed. Fluid Overload, Delayed Graft function/Graft rejection, Infection and Anxiety.

## PREVENTIVE NEPHROLOGY

### Abstract WPO 29:

#### KNOWLEDGE OF KIDNEY FUNCTION, DISEASE AND ITS RISK FACTORS AMONGST UNDERGRADUATES IN A NIGERIAN UNIVERSITY

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**Background:** Chronic Kidney Disease, a persisting and progressive impairment of kidney function now assumes epidemic proportion globally. Despite the lack of community based studies, hospital derived data and sentinel survey suggest that prevalence is increasing and approaching 1000 cases pmp in Nigeria. Unfortunately CKD in our environment affects young adults in their economically productive years who are ill able to afford the exorbitant cost of treatment. To be able to mount preventive strategies there is need for kidney health education and major risk factors promoting kidney disease.

**Aim:** We set out in this study to assess the baseline level of knowledge of kidney function, disease and its risk factors among undergraduates of OAU, Ile-Ife.

**Methodology:** This cross-sectional descriptive study was carried out in OAU. Pre-tested self administered questionnaire were distributed to students in their various halls, blocks and rooms using multistage sampling technique. Data retrieved was analysed using SPSS package.

**Results:** Of the 700 administered questionnaires, only 694 were returned. Majority of the respondents (88%) were younger than 25 years, only 0.1% was older than 30 years. 352 of them (50.7%) were males while females constituted 49.3%. Only 8.2% of the respondents demonstrated fair to good knowledge while a whopping 91.8% had poor knowledge of kidney function and disease. Of the risk factors for kidney disease, only 8.6% had fair to good knowledge, while the remaining 91.4% had poor knowledge. The attitude towards kidney disease was poor in 78.9% while it was good in 21.1%. We found that the knowledge of risk factors significantly influenced their health seeking attitude ( $X^2 = 8.576$ ,  $P = 0.003$ ).

**Conclusion:** The knowledge of kidney health, features of kidney disease and its risk factors as well as attitude towards kidney disease are generally poor in the studied population. Kidney health education is necessary to positively change the health seeking attitude and behaviour in our undergraduates.

MISCELLANEOUS.

**Abstract WPO 30:**

*Adedamola Soyibo*

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**Aim:** To develop a renal registry that will monitor renal epidemiology in the Caribbean and help determine the burden of disease.

**Methods:** Questionnaires were sent out to different Caribbean countries for distribution to the dialysis units. Data were obtained for patients with End Stage Renal Disease (ESRD) who were on long term renal replacement therapy in 2006. The demographic data, type of renal replacement therapy, laboratory data and causes of ESRD were obtained from the questionnaire. Data were analyzed using SPSS 11.0

**Results:** Data were reported from six English-speaking Caribbean countries: Bahamas (n = 211), Barbados (n = 185), British Virgin Islands (n = 27), Cayman Islands (n = 41), Jamaica (n = 366) and Trinidad and Tobago (n = 436). Haemodialysis was reported in all the countries; transplantation was not reported from the Cayman Islands. Only Bahamas, Jamaica and Trinidad and Tobago reported peritoneal dialysis. In Jamaica, male to female ratio was 1.5:1. The three commonest causes of end stage renal failure were hypertension (50.0%), diabetes mellitus (21.0%) and primary chronic glomerulonephritis (9.6%). The age range was 11–94 years (mean 47.7 years). Barbados had a male to female ratio of 1.8:1, age range of 19–81 years (mean age: 52.3 years). Hypertension (55.7%) and diabetes mellitus (27.0%) were the commonest causes. Trinidad and Tobago had a male to female ratio 1.3:1. The age range was 8–84 years (mean age 52.5 years). The four commonest causes of ESRD were diabetes mellitus (28.9%), hypertension (25.3%) and autosomal dominant polycystic kidney disease (3.9%) and chronic glomerulonephritis (3.9%). The British Virgin Islands, Tortola, had a male to female ratio 1.7:1.0. Age range was 26–86 years (mean, 57 years). Hypertension (67.9%) and diabetes mellitus (46.4%) were also the commonest causes. The Bahamas had a male to female ratio of 1:1.1 unlike the other countries. Hypertension (25.6%), diabetes mellitus (28.0%) and chronic glomerulonephritis (13.3%) were the commonest causes of ESRD. The Cayman Islands reported a male to female ratio of 1.2:1, with a mean age of 54.3 years. Hypertension (n = 27), diabetes mellitus (n = 12) and autosomal dominant polycystic kidney disease (n = 3) were the commonest causes of ESRD. Barbados and Jamaica had more than 50 per cent of its renal replacement therapy patients with serum albumin above the minimum of the normal range of 35–40 g/L. In regards to the calcium phosphate product, two-thirds of the patients in all countries reporting data had values below the recommendation of 4.4 mmol<sup>2</sup>/L<sup>2</sup>. The percentage of patients achieving haemoglobin concentration above 10.0 g/dL was: 16.9% for Jamaica, 75.6% for The Cayman Islands, 35.9% for Barbados and 68.6% for Tobago. Erythropoietin usage was not reported. The URR was only available for Jamaica and the Bahamas and 80.6% and 60.9% respectively had URR above the accepted value of 65%. For all reporting countries the range of patients coded for hypertension but who also had diabetes mellitus was 2.2% to 17.1%. Only Bahamas reported on vascular access with 51.7% of patients having native arteriovenous fistulae.

**Conclusion:** Hypertension, diabetes mellitus and chronic glomerulonephritis were the commonest causes of ESRD across most of the English-speaking Caribbean countries. Peritoneal dialysis was only offered in some of the islands and kidney transplantation was rarely reported. More males than females were on long term renal replacement therapy in most of the islands.

**Abstract WPO 31:**

**ADHERENCE TO THERAPY: AN UNSUSPECTED CHALLENGE FOR NEPHROLOGIST  
IN DEVELOPING COUNTRIES**

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**Background:** Poor adherence to medication regimens accounts for substantial morbidity, mortality, and increased health care costs in developing countries.

**Objective:** To assess adherence to therapy in non-dialysed patients with chronic kidney diseases and to identify the major barriers to adherence.

**Patients and Method:** We conducted prospective study during three months at the nephrology department of teaching hospital in Dakar-Senegal. Data were collected using a questionnaire. Rate of adherence (ROA) was defined as the percentage of the prescribed doses of the medication actually taken by the patient within a four weeks period. Statistical analysis was realised with SPSS 11.0.

**Results:** Mean ROA was  $81 \pm 12$  % (46 - 100%) with a difference between male (75%) and female (84%). Three quarters of patients reported ROA more than 80%. Patients' adherence was inversely proportional to daily frequency of dose but not number of drugs. Blood pressure control and estimated glomerular filtration rate were not significantly correlated to adherence. Major obstacles to adherence were: complexity of drug regimen (OR = 3.33 [95% IC=2.50-4.32];  $p < 0.001$ ), auto-medication with plants (OR = 3.26 [95% IC=0.99-2.05];  $p = 0.005$ ), healthcare system inaccessibility (OR = 2.65 [95% IC=0.97-2.96];  $p = 0.002$ ), lack of information (OR = 2.35 [95% IC=1.22-3.57];  $p = 0.04$ ), side effects (OR = 1.654 [95% IC=1.05-1.96];  $p = 0.002$ ), high cost of medications (OR = 1.47 [95% IC=0.89-1.85];  $p = 0.004$ ) and forgetfulness (OR = 1.37 [95% IC=1.08-2.64];  $p = 0.004$ ).

**Conclusion:** Many obstacles contribute to poor adherence in patients with CKD. Most of barriers to adherence can be overcome by better communication between patients and health providers and accessibility of healthcare system.

**Keywords:** ADHERENCE TO THERAPY, CHRONIC KIDNEY DISEASES, SUB-SAHARAN AFRICA

**Abstract WPO 32:**

**PREVALENCNE OF ENURESIS AMONG PRIMARY SCHOOL CHILDREN IN SAGAMU  
LOCAL GOVERNMENT AREA, OGUN STATE**

*Adekanbi AF and Ogunlesi TA*

**Background:** Enuresis is a common problem among children and adolescents.

**Objective:** To determine the prevalence of enuresis among school-aged children in Sagamu LGA

**Method:** Cross-sectional descriptive study of the age, sex and socio-economic status of primary school pupils with and without enuresis.

**Result:** Seven hundred and ten children aged between 5 and 18 years were interviewed. The mean age was  $9.9 \pm 2.7$  years. There were 358 (50.4%) males and 352 (49.6%) females with a male-to-female ratio of

1:1. One hundred and thirty three (18.7%) subjects had nocturnal enuresis while the remaining 577 (81.3%) did not have enuresis. This gives a prevalence of enuresis of 18.7%. The mean age of the subjects with enuresis was significantly lower than the mean age of the subjects without enuresis [ $7.89 \pm 1.97$  years vs  $10.45 \pm 2.34$  years;  $t = 11.7$ ,  $p = 0.000000$ ]. The prevalence was highest among subjects aged between 5 and 8 years and it decreased with increasing age. There were significantly more males in the enuretic group compared with the non-enuretic group [81 (60.9%) vs 277 (48.0%);  $\chi^2 = 7.19$ ,  $p = 0.007$ ]. Three hundred and fifty seven subjects (50.3%) had enuretic siblings. The proportion of enuretic subjects with enuretic siblings was not significantly different from the proportion of non-enuretic subjects with enuretic siblings [67 (50.4%) vs 290 (50.3%);  $\chi^2 = 0.001$ ,  $p = 0.981$ ]. Three hundred and fifty one (98.3%) subjects had a single enuretic sibling. All the subjects belonged to the socio-economic classes IV and V.

**Conclusion:** Enuresis is a common problem in children

**Abstract WPO 33:**

**COMPARATIVE STUDY ON ENURESIS IN CHILDREN**

*Adekanmbi AF, Ogunlesi TA and Fetuga MB*

**Background:** Enuresis is a common problem amongst children and is thought to be affected by age and socioeconomic status.

**Objective:** To compare the prevalence of enuresis amongst children in public primary school and private primary school.

**Method:** Cross-sectional descriptive study of the age, sex and socio-economic status of primary school pupils with and without enuresis in both public and private primary schools. The public schools are referred to as group A and the private school group B.

**Result:** A total of 1,054 pupils were interviewed; 710 (67.36%) were from the public schools and 344 (32.64%) from private schools. The age range was 5-13years (mean  $\pm$  SD of 1.823yr) in Group B and 5-18 years (mean  $\pm$  SD of 2.487yr) in group A. The mean ages were  $9.9 \pm 2.5$ years and  $8.5 \pm 1.8$ years respectively though this was statistically significant  $p=(0.000)$ . There was no sex predilection in both groups ( M:F =1:1 and 0.9:1). The prevalence of enuresis in group A was 16.0% and 17.5% in group B. Males were more enuretic than females in the two groups. The mean ages of the enuretics in the two groups was statistically significant  $p=0.04$ . All the pupils in group A were from the classes IV and V of the socioeconomic classification while only 34%(117) of the group B were from the classes IV and V. There were more enuretics in the class III of the group B (29/55 52.7%).

**Conclusion:** Enuresis is commoner in males and occurs more in the lower socio-economic strata.

**Abstract WPO 34:**

**CONFLICT SITUATIONS IN HEALTH SERVICE WORKS: A STUDY OF HEALTH PROFESSIONALS IN A TEACHING HOSPITAL**

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**Background:** Conflict being an integral part of human existence is a relatively common feature of all sectors of human endeavour, especially where individuals work together as teams. Much of contemporary

health care is delivered either directly or indirectly by several professionals working in teams. The study therefore assessed the occurrence, perception and attitude of health professionals to conflict in Obafemi Awolowo University Teaching Hospital Complex, (OAUTHC) Ile-Ife. It particularly examined conflict handling styles among the health professionals.

**Methods:** One hundred and fifty seven (157) health professionals selected by multistage sampling technique formed the sample. Data collection employed a structured questionnaire and an indepth interview schedule with selective probes. Data collection took two weeks and data analysis was done with aid of Statistical Package for Social Sciences (SPSS).

**Results:** Results showed that the frequency of occurrence of conflict among health professionals studied is rather rampant as evidenced by 14% who claimed to have been frequently involved in conflict situations and another 62% who submitted that they occasionally been involved. The study also revealed a generally satisfactory perception (88.7%) and a very satisfactory attitude of the health professionals to conflict. The study further established a significant relationship between discipline (occupation) and frequency of occurrence of conflict among the health professionals ( $\chi^2 = 18.7$ ;  $p = 0.04$ ). No significant relationship was however found between gender and occurrence of conflict among the health professionals ( $\chi^2 = 3.26$ ;  $p = 0.2$ ). Lastly, data established that health professionals employ a multiplicity of conflict handling styles when confronted with conflict situations at work.

**Abstract WPO 35:**

**NEPHROLOGY NURSING EDUCATION IN NIGERIA: PROBLEMS AND CHALLENGES**

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Nursing as a practice-based discipline is undergoing some reforms all over the world. Beyond the emergence of nursing science, innovative advances in health care demands that Nursing as a profession should prepare practitioners who would meet the challenges of care within the context of a complex milieu. While it may be true that Nursing has taken a giant leap from the days of intuitive care to highly sophisticated care, the training of nurses to fit purpose in the third world still face some challenges. The curriculum for General Nursing in Nigeria has little content of nephrology nursing. Yet nurses have incomparable roles to play in preventive, therapeutic and rehabilitative nephrology. This explains why it has become crucial for nurses to have appropriate understanding and competence in preventive, therapeutic and rehabilitative nephrology. Besides, competent nurses are needed to work in evolving sophisticated renal care team that brings specialists from other profession. Some of the daunting challenges facing Nephrology Nursing in Nigeria include: resistant to change; slow pace of scholarship in nursing; little or no academic recognition of nurses qualification; development of curricula that are congruent with the latest development in the world of Nephrology Nursing as well as educational system of the country; non uniform implementation of specialization in nursing with reckless abandonment of Nephrology Nursing. All these inform the need for developing programme that can to meet the challenges of the evolving reforms in nursing education as well as makes demand for innovation that will meet the needs of practicing nurses.

## INFECTIONS AND THE KIDNEYS

### Abstract WPO 36:

#### PYONEPHROSIS IN YAOUNDE GENERAL HOSPITAL: A REVIEW OF 21 ADULT CASES

*Mbede Y, Fouda H, Tataw J, Gashuntantang, FK and Angwafo III, F*

**Background:** Pyonephrosis is a preventable cause of nephron loss which is still common in emerging countries. Neglected urinary tract obstruction is the underlying cause of the condition. Morbidity remains extremely high and mortality from septicemia is not uncommon.

**Aim :** The aim of our study was to analyse the clinical features, underlying causes, treatment modalities and patient outcome in patients with pyonephrosis.

**Patients and Methods:** We carried out a retrospective and descriptive analysis of all adult patients seen with pyonephrosis over a six year period from 2000-2006 in the Yaounde General hospital. Patient characteristics, causes of obstruction, bacteriologic agents, treatment modalities, and outcome were noted. All cases of renal tuberculosis were excluded.

**Results:** A total of 21 patients were seen during the study period with a mean age of 42.75years. The sex ratio was 1:8 in favor of females. The frequent past medical history noted were urinary tract infection (72%), nephrolithiasis (16%), urologic surgery (12%) Automedication with antibiotics was found in 16% of cases. The main clinical features seen were fever (80%), lumbar pain (76%), cachexia (18%). Leucocytosis (75%) and anemia(54.17%) were the frequent. Urinalysis revealed pyuria in 72%, and urine cultures were positive in 47.6% of cases. Serum creatinine was within normal in all cases. Ureter-pelvic junction obstruction (56%), nephrolithiasis(28%), and tumors(16%) were the common causes of urinary tract obstruction. Treatment involved antibiotics plus the following surgical modalities: nephrectomy (64%), nephrostomy then nephrectomy(32%) nephrostomy only(4%). Culture of pus was positive in 71.43% of cases and Gram negative bacilli were responsible in all cases. Post operative complications encountered were subphrenic abscess 10%, empyema 5%, and peritonitis 5%. Mortality was 0%.

**Conclusion:** Pyonephrosis is a preventable cause of nephron loss. Early diagnosis and adequate treatment of both urinary tract infection and obstruction will be the cornerstone of prevention.

**Keywords:** PYONEPHROSIS, ETIOLOGY, TREATMENT

### Abstract WPO 37:

#### RECURRENT URINARY TRACT INFECTION IN THE PAEDIATRIC AGE-GROUP IN WESLEY GUILD HOSPITAL, ILESA, OSUN-STATE

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**Introduction:** Situations arise that a child becomes asymptomatic after appropriate antibiotic treatment for urinary tract infection, remains asymptomatic for a variable period of time, and subsequently develops another culture-proven infection. Recurrent urinary tract infections in the Paediatric age group may be sequel to structural abnormalities, dysfunctional voiding (when a child doesn't urinate frequently or doesn't relax his muscles properly while urinating) or iatrogenic with prolonged use of urinary catheter. There is always the need to identify the cause which is subsequently treated.

**Aim:** To determine the prevalence, aetiology and outcome in children with recurrent urinary tract infection in Wesley Guild Hospital, Ilesa.

**Methodology:** A prospective study was carried out on all the children aged one month to 15 years, seen with features of urinary tract infection at the Infant Welfare Clinic and the children emergency unit of the Wesley Guild Hospital, Ilesa from January 2006 to December 2008. All were initially admitted and put on parenteral antibiotics (ampicillin and gentamicin). Once the organism is identified, a more suitable antibiotic is used based on the culture and sensitivity results. Those with another attack were further investigated by ultrasonography and intravenous urography. They were treated all over and commenced on prophylactic antibiotic therapy.

**Results:** Out of the 54 children with urinary tract infection during this study period, there was recurrence in 7 (12.96%) of them. Male to female ratio of 5:2. Investigations revealed anomalies in form of vesico-ureteral reflux in two children, renal cyst in one and bladder stone in another one. No anomalies were found in the remaining three. *Escherichia coli* was the commonest organism isolated during the initial investigation and recurrence. Sickle cell anaemia was diagnosed in the child with renal cyst and one of the two with vesico-ureteral reflux.

**Conclusion:** A significant number of children with UTIs are coming with recurrence. There is need for awareness and education among the general public. Paediatric nephrologists, Urologists and Paediatric Surgeons are to work in harmony in the management of these patients.

## ***Urinary Abnormalities, Blood Pressure and Anthropometric Profiles Among Students in a Nigerian University***

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### **ABSTRACT**

Reports from Nigeria indicate that young adults bear a disproportionate significant burden of end-stage renal disease (ESRD). Hypertension and chronic glomerulonephritis which account for e" 70% of the causes of ESRD in Nigeria can be diagnosed at an early stage by measurement of blood pressure and urine examination. Early detection of these diseases will allow early initiation of appropriate therapies and educational strategies, which will in turn impact positively on kidney outcome. This study was embarked upon to determine the frequency of urinary abnormalities, blood pressure and anthropometric profiles in university students. We conducted a cross sectional study in 131 (68 males, 63 females) 400L medical students of Ladoke Akintola University of Technology to determine the prevalence of urinary abnormalities, prehypertension, hypertension and overweight/obesity. The prevalence of prehypertension and hypertension in our cohort was 48% and 5% respectively. Overweight and obesity were found in 10.7% and 3.0% participants respectively. None of our study participants had significant urinary abnormality. In conclusion, our study shows that prehypertension and hypertension thus occur among university students. Thus, there is need to promote the initiation and sustenance of lifestyle modifications at an early age since this may help in the prevention of hypertension or progression of prehypertension to hypertension.

### **INTRODUCTION**

Chronic kidney failure (CKF) represents the end of the continuum of chronic kidney disease (CKD) and is a devastating medical, social and economic burden for the patients, their families and the country as a whole [1,2]. Available reports indicate that the incidence and prevalence of CKF are on the increase globally [3-5]. The annual growth rate of patients with end-stage renal disease (ESRD) requiring renal replacement therapy (RRT) is between 5.0 % and 8.0% which far exceeds the world's population growth rate of 1.2% – 1.3% [5,6]. In addition, the average annual cost of RRT per patient is far in excess of the gross national income (GNI) per capita of most developing countries (economies) [7-9]. Thus, Nigeria may not be able to offer RRT to patients with ESRD. Reports from Nigeria also indicate that young adults bear a disproportionate significant burden of ESRD [10-12]. For example, 52% of the patients dialyzed between 1990 and 1995 at the University College Hospital, Ibadan were < 35 years of age.10 Thus, it is imperative that the nation must pursue a vigorous preventive program to reduce the burden of CKF.

Hypertension and chronic glomerulonephritis account for e" 70% of the causes of ESRD in Nigeria [10-12]. These diseases can be diagnosed at an early stage by measurement of blood pressure and examination of the urine. Early detection of these diseases will allow early initiation of appropriate

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therapies and educational strategies, which may in turn impact positively on kidney outcome.

A continuous graded relationship exists between blood pressure (BP), cardiovascular disease (CVD) and CKD [13]. This relationship is present even at BP levels considered to be within non-hypertensive range [13]. This finding necessitated the introduction of prehypertension, defined as office systolic blood pressure (SBP) of 120 – 139 mm Hg and/or diastolic blood pressure (DBP) of 80 – 89 mm Hg in the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC 7) [14]. Many reports have shown that prehypertension is associated with increase in all cause and CVD mortality [15-17]. Prehypertension and hypertension have been associated with overweight /obesity suggesting that the prevalence of this condition will increase over time if the obesity epidemic continues to grow [15]. Obesity has also been associated with type 2 diabetes mellitus, coronary artery disease, stroke, arthritis, sleep apnoea syndrome and certain cancers [18]. The diagnosis of prehypertension and obesity should prompt the institution of lifestyle modifications at an earlier stage to prevent progressive rise in BP and related CVD.

In view of the high prevalence of ESRD in young adults in Nigeria and the opportunity that blood pressure measurement and urine examination offers in the early detection of hypertension and glomerulonephritis, this study was embarked upon to determine the prevalence of urinary abnormalities, hypertension, prehypertension and overweight/obesity in university students.

### **SUBJECTS AND METHODS**

This was a cross sectional study involving 400 level clinical year students of Ladoke Akintola University of Technology (LAUTECH), Osogbo, Osun State, Nigeria. The study population consisted of 135 students who agreed to be part of the study after the aim and protocol had been explained to them. Female students were instructed to submit their urine after completion of menstruation in those undergoing menstruation. Excluded from the study were students who refused to be part of the study. The study protocol was approved by Research Ethics Committee of the Ladoke Akintola University of Technology.

A structured questionnaire was used to obtain information such as age, gender, marital status, current

history of smoking, alcohol intake, oral contraceptive use, participation in formal exercise for e" 3 days per week, personal and family history of hypertension, diabetes and chronic kidney disease.

The weight (in kg) of each participant was taken in light clothing with the shoes off and the height (in metres) was done using a stadiometer. The body mass index (BMI) was calculated from weight/height<sup>2</sup> (kg/m<sup>2</sup>). Overweight and obesity were defined as BMI of 25 – 29.9 kg/m<sup>2</sup> and e"30 kg/m<sup>2</sup> respectively [14]. The waist circumference [WC] (in centimetres) was taken midway between the lowest rib and the iliac crest. The hip circumference [HC] (in centimetres) was taken at the level of the greater trochanters. Abdominal obesity was defined as abdominal circumference e" 102 cm in males and e" 88 cm in females [14]. The waist-hip ratio was determined by dividing the WC by the HC.

Each participant was instructed about urine sample collection. A mid-stream morning urine specimen was collected from each of the participants. Urinalysis was done using Combi 9 MultistixR by Bayer immediately after voiding. A 10 ml urine aliquot was then centrifuged at 3000 revolutions per minute (rpm) for 5 minutes and the supernatant was poured into a separate tube [19]. A drop of the urine sediment was placed on a glass slide and covered with cover-slip. At least 10 microscopic fields of the sample were examined at low and high magnification [19]. Urine microscopy was done within 2 hours of specimen collection. Persistent dipstick proteinuria of e" 1+, persistent dipstick haematuria e" 1+ in the absence of urinary tract infection, menstruation or strenuous exercise, presence of dysmorphic red blood cells, > 5 white blood cells per high power field (hpf), > 2 red blood cells /hpf, cellular casts and large quantity of hyaline cast were taken as important finding(s) [19]. All the urine microscopy examination was done by one of the authors (HAO).

The blood pressure (BP) of the participants was done using a mercury sphygmomanometer with appropriate cuffs and standardized protocols [20]. Each participant was allowed five minutes rest before BP measurement. Attempts were made also to ensure that participants had not taken coffee or smoked cigarette 30 minutes before BP was taken. Korotkoff's sounds I and V were taken as the systolic blood pressure (SBP) and diastolic blood pressure (DBP) respectively [20]. Three blood pressure readings were taken and the average of the last two readings was used for analysis. Blood pressure

readings were classified according to the JNC 7 report [14]. When SBP and DBP fall into different categories, the higher category was selected to classify individual's BP. Normal blood pressure was defined as SBP < 120 mm Hg and DBP < 80 mm Hg. Prehypertension was defined as SBP between 120 and 139 mm Hg and/or DBP between 80 and 89 mm Hg [14]. Participants were classified as having hypertension if SBP was persistently  $\geq$  140mm Hg and / or DBP was  $\geq$  90 mm Hg or if on treatment with antihypertensive medication [14]. Participants who had BP in the hypertension range had their BP taken on two other separate occasions within two weeks to confirm persistent elevation of BP [14]. Pulse pressure was determined from difference between SBP and DBP. Conventional mean arterial

blood pressure (MAP) was calculated using the formula:  $MAP = DBP + \{1/3 (SBP - DBP)\}$

### STATISTICAL ANALYSIS

Data analysis was performed using SPSS software, version 15 (SPSS Inc., Chicago, Illinois, USA). Continuous and categorical variables were displayed as means  $\pm$  standard deviation (S.D) and percentages respectively. The student's t test was used to assess differences between means. Differences between categorical variables were analyzed by Chi-square test with Fisher's exact correction applied as appropriate. Differences between groups were analyzed by analysis of variance (ANOVA). A  $p < 0.05$

**Table 1:** Baseline demographic and clinical characteristics of the study population

Participants' characteristics	Male (%)	Female (%)	Total (%)
Gender	68 (52)	63 (48)	131 (100.0)
Mean age (years)	25.4 $\pm$ 2.5	24.7 $\pm$ 1.4	25.1 $\pm$ 2.1
Family history of hypertension			
Yes	20 (29.4)	19 (30.2)	39 (29.8)
No	40 (58.8)	40 (63.5)	80 (61.1)
Don't know	8 (11.8)	4 (6.3)	12 (9.1)
Family history of DM			
Yes	10 (14.7)	12 (19.0)	22 (16.8)
No	55 (80.9)	50 (79.4)	105 (80.2)
Don't know	3 (4.4)	1 (1.6)	4 (3.0)
Family history of CKD			
Yes	1 (1.5)	1 (1.6)	2 (1.5)
No	66 (97.0)	61 (96.8)	127 (97.0)
Don't know	1 (1.5)	1 (1.6)	2 (1.5)
Personal history of hypertension			
Yes	1 (1.5)	0 (0.0)	1 (0.8)
No	67 (98.5)	63 (100.0)	130 (99.2)
Personal history of DM			
No	68 (100.0)	63 (100.0)	131 (100.0)
Formal exercise			
Yes	1 (1.5)	9 (14.3)	0 (7.6)
No	67 (98.5)	54 (85.7)	121 (92.4)
Current alcohol intake			
Yes	2 (2.9)	0 (0.0)	2 (1.5)
No	66 (97.1)	63 (100.0)	129 (98.5)
Current smoking			
No	68 (100.0)	63 (100.0)	131 (100.0)

0.05 for 2 tailed tests was used to determine statistical significance.

**RESULTS**

The study population consisted of 131 students [68 males (51.9%) and 63 females (48.1%)]. Table I showed the baseline demographic and clinical characteristics of the study population. The mean age

mean SBP and DBP of the study population were  $118.7 \pm 12.6$  mm Hg and  $74.7 \pm 8.0$  mm Hg respectively. Compared to females, males had a significantly higher mean DBP ( $78.8 \pm 7.3$  vs.  $72.3 \pm 8.1$  mm Hg,  $p = 0.001$ , 95% CI 1.8 – 7.2), higher MAP ( $91.4 \pm 8.0$  vs.  $87.1 \pm 8.9$  mm Hg, 95 % CI = 1.4 – 7.2,  $p = 0.004$ ), as well as a higher mean WHR ( $0.87 \pm 0.05$  vs.  $0.80 \pm 0.05$ , 95% CI = 0.05 – 0.08,  $p <$

**Table 2:** Blood pressure and anthropometric profiles of study participants.

Participants' characteristics	Male (n=68)	Female (n=63)	Total (n=131)	95% CI	p value
Age (years)	25.4±2.5	24.7±1.4	25.1±2.1	0.03 - 1.43	0.042
SBP(mm Hg)	120.6±12.1	116.7±13.0	118.7±12.6	-0.44 - 8.24	0.078
DBP(mm Hg)	78.8±7.3	72.3±8.1	74.7±8.0	1.84 - 7.16	0.001
PP (mm Hg)	43.8±9.6	44.4±9.8	44.1±9.7	-3.96 - 2.76	0.724
MAP(mm Hg)	91.4±8.0	87.1±8.9	89.3±8.7	1.39 - 7.21	0.004
Weight (kg)	64.3±7.3	58.2±9.8	61.4±9.1	3.19 - 9.12	<0.001
Height (m)	1.72±0.07	1.62±0.06	1.67±0.08	0.08 - 0.12	<0.001
BMI (kg/m <sup>2</sup> )	21.8±2.0	22.2±3.7	22.0±2.9	-1.43 - 0.61	0.431
WC (cm)	75.2±5.5	75.5±8.0	75.3±6.8	-2.70 - 2.21	0.780
HC (cm)	86.6±5.3	94.1±8.6	90.2±8.0	-9.99 - -5.08	<0.001
WHR	0.87±0.05	0.80±0.05	0.84±0.06	0.05 - 0.08	<0.001

**Key:** Values for continuous variables are mean ± SD. CI – confidence interval, M – male, F – female, SBP – systolic blood pressure, DBP – diastolic blood pressure, MAP – mean arterial pressure, PP – pulse pressure, BMI – body mass index, WC – waist circumference, HC – hip circumference, WHR – waist hip ratio.

of the study population was  $25.1 \pm 2.1$  years (range 21 – 34 years). Family history of hypertension, diabetes mellitus and CKD was obtained in 39 (29.8%), 22 (16.8%) and 2 (1.5%) participants respectively. Only 10 participants formally undertook exercise. None of the participants currently smokes and the frequency of alcohol consumption was also quite low. None of the female participants was on oral contraceptive pills.

None of the participants had significant proteinuria (defined as e<sup>+</sup>1+) though 18 (13.7%) had trace proteinuria. None of the participants had haematuria, glycosuria, leucocyturia or significant cellular elements on urinary microscopy.

Table 2 showed the blood pressure and anthropometric profiles of the study population. The

0.001) [Table 2]. Males were also significantly taller ( $1.72 \pm 0.07$  vs.  $1.62 \pm 0.06$ , 95% CI = 0.08 – 0.12,  $p < 0.001$ ) and heavier than females ( $64.3 \pm 7.3$  vs.  $58.2 \pm 9.8$  kg, 95% CI = 3.2 – 9.1,  $p < 0.001$ ).

However, there was no statistically significant difference in the BMI of male and female participants ( $21.8 \pm 2.0$  vs.  $22.2 \pm 3.7$  kg/m<sup>2</sup>, 95 % CI = 0.6 – 1.4,  $p = 0.43$ ). Females on the other hand had a statistically significant higher mean HC than males. Ten participants (9 females, 1 male) engaged in formal exercise. Participants who engaged in formal exercise had significantly lower DBP ( $68.8 \pm 7.2$  vs.  $75.1 \pm 7.9$ , 95% CI = - 1.23 to -11.42,  $p = 0.015$ ) and comparable SBP ( $120.2 \pm 17.3$  vs.  $118.6 \pm 12.3$ , 95% CI = -6.68 to 9.28,  $p = 0.707$ ) when compared to those who did not engage in formal exercise. After

correcting for the effect of gender, females engaged in regular formal exercise still had significant lower When compared with participants with normal BP, participants with prehypertension had statistically

**Table 3:** Blood pressure classification (according to JNC 7), body mass index, abdominal obesity categories and engagement in formal exercise of the study population

Participants' characteristics	Male n = 68 (%)	Female n = 63 (%)	p value
<b>Systolic blood pressure (mm Hg)</b>			
< 120	31 (45.6)	40 (63.5)	0.117
120 - 139	33 (48.5)	20 (31.7)	
140 - 159	3 (4.4)	2 (3.2)	
e" 160	1 (1.5)	1 (1.6)	
<b>Diastolic blood pressure (mm Hg)</b>			
< 80	38 (55.9)	50 (79.4)	0.017
80 - 89	28 (41.2)	11(17.4)	
90 - 99	2 (2.9)	1 (1.6)	
e" 100	0 (0.0)	1 (1.6)	
<b>Body mass index (kg/m<sup>2</sup>)</b>			
< 25	63 (92.6)	50 (79.4)	0.04
25.0 - 29.9	5 (7.4)	9 (14.3)	
e" 30	0 (0.0)	4 (6.3)	
<b>Abdominal obesity</b>			
Yes	0 (0.0)	4 (6.3)	0.035
No	68 (100.0)	59 (93.7)	
<b>Formal exercise</b>			
Yes	1 (1.5)	9 (14.3)	0.007
No	67 (98.5)	54 (85.7)	

DBP ( $67.28 \pm 5.60$  vs.  $73.15 \pm 8.19$  mmHg, 95% CI = -10.52 to -0.22,  $p = 0.017$ ) when compared with their counterparts who did not engage in formal exercise. When compared to those without family history of hypertension, participants with family history of hypertension had a higher, though insignificant mean SBP ( $119.7 \pm 8.7$  vs.  $118.0 \pm 14.2$  mm Hg,  $p = 0.496$ ) and DBP ( $75.4 \pm 6.2$  vs.  $73.9 \pm 8.3$ ,  $p = 0.313$ ).

Table 3 showed the BP, BMI and abdominal obesity distribution of the study population. The frequencies of overweight and obesity in the participants were 10.7 % and 3.0 % respectively with more female participants having BMI e" 25 kg/m<sup>2</sup> (21% vs. 7%,  $p = 0.027$ ). Also, abdominal obesity was found in 4 females and none of the males ( $p = 0.035$ ).

Normal BP, prehypertension and hypertension were found in 47%, 48% and 5% of the participants respectively (Table 4). More males had prehypertension compared to females (60% vs. 35%,  $p = 0.002$ ) [Table 4]. Majority of the participants (71%) with hypertension had stage 1 hypertension.

significant higher mean weight ( $65.3 \pm 8.9$  vs.  $57.2 \pm 7.9$  kg,  $p < 0.001$ ), higher mean BMI ( $22.9 \pm 3.3$  vs.  $21.0 \pm 2.4$ ,  $p < 0.001$ ), higher mean WC ( $77.2 \pm 7.2$  vs.  $73.4 \pm 6.0$  cm,  $p = 0.002$ ) and higher WHR ( $0.85 \pm 0.06$  vs.  $0.82 \pm 0.06$ ,  $p = 0.02$ ) [Table IV]. There was no statistically significant difference in the gender population, weight, BMI, WC, HC and the WHR of participants with prehypertension and those with hypertension (Table 4).

## DISCUSSION

The prevalence of obesity in our study was 3.0% which is comparable to 3.4% in the study by Odili *et al.* in undergraduates at Delta State University.<sup>21</sup> However, the prevalence of overweight of 10.7% in our study was much lower than 23.9% by Odili *et al.* and 27% by Huang *et al.* in USA college students.<sup>22</sup> Also, the prevalence of obesity and overweight in our cohort were less than 14.8% and 7.4% respectively obtained in urban Nigerian women aged 25 to 34 years.<sup>23</sup> The reasons for this difference is not obvious may relate to caloric intake, level of physical exertion and family history of obesity.

Male participants in this study had higher SBP and DBP compared to females, a finding that was also shown by Odili *et al.* [21]. This gender difference obtained for sub-Saharan Africa in the analysis of worldwide data of hypertension by Kearney *et al.* [25]

**Table 4:** Demographic, anthropometric and clinical characteristics of participants with prehypertension as compared with participants with normal blood pressure and hypertension

Participants' characteristics	Normotensive (n=61)	Prehypertensive (n=63)	pa	Hypertensive (n=7)	pb
Gender (M/F)	23/38	41/22	0.002	4/3	0.327
Age (years)	24.8±1.6	25.2±2.2	0.27	26.4±3.3	0.192
SBP(mm Hg)	109.6±5.9	123.7±7.6	<0.001	153.0±7.3	<0.001
DBP(mm Hg)	69.3±4.9	78.4±5.6	<0.001	87.4±13.6	0.001
Conventional					
MAP (mm Hg)	82.7±4.7	93.5±4.5	<0.001	109.2±10.5	<0.001
PP (mm Hg)	40.3±5.1	45.3±9.5	0.001	65.6±11.8	<0.001
Weight (kg)	57.2±7.9	65.3±8.9	<0.001	59.6±5.8	0.108
Height (m)	1.65±0.07	1.69±0.09	0.008	1.64±0.07	0.131
BMI (kg/m <sup>2</sup> )	21.0±2.4	22.9±3.3	<0.001	22.2±1.5	0.583
WC (cm)	73.4±6.0	77.2±7.2	0.002	75.1±5.8	0.472
HC (cm)	89.3±6.4	91.3±9.4	0.170	87.7±7.1	0.329
WHR	0.82±0.06	0.85±0.06	0.02	0.86±0.08	0.592

**Key:** Values for continuous variables are mean ± SD. M – male, F – female, SBP – systolic blood pressure, DBP – diastolic blood pressure, MAP – mean arterial pressure, PP – pulse pressure, BMI – body mass index, WC – waist circumference, HC – hip circumference, WHR – waist hip ratio. Pa – post-hoc p value for comparison between participants with normal blood pressure and those with prehypertension. Pb – post-hoc p value for comparison between participants with prehypertension and those with hypertension.

in BP can be explained by the fact that during the teenage years, average BP is consistently higher for boys than for girls such that by age 18 years, boys have average systolic and diastolic blood pressures that are almost 10 mm Hg and 5 mmHg higher, respectively, than the corresponding values for girls.24 The frequency of hypertension in our cohort was 5% which was slightly higher than 3.4% obtained by Odili *et al.* However, our value is much lower than 9.9% (in women) and 10.5% (in men) aged 20 – 29 years

Males had a larger WHR than females, an observation primarily due to females having larger HC compared to males. Females were more obese and showed significant truncal obesity, a dimension of obesity that has been shown to have more adverse health consequences such as impaired glucose tolerance, diabetes mellitus, hypertension, heart disease and stroke than peripheral obesity.

Our finding of lower diastolic BP in participants who engaged in formal physical exercise was consistent with findings from observational

epidemiological and randomized controlled studies that demonstrated an inverse relationship between physical activity and blood pressure.<sup>26-28</sup> In a meta-analysis by Whelton *et al* involving 54 randomized controlled trials, pooled estimates showed that aerobic exercise was associated with a significant reduction in SBP (-3.84 mmHg) and DBP (-2.58 mmHg).<sup>28</sup> The mechanisms by which physical exercise reduce BP include reduction in weight; improvement in insulin sensitivity with subsequent reduction in insulin levels, a factor that has been implicated in the pathogenesis of hypertension; and enhancement of endothelium-dependent vasodilatation which is mediated in part by increased nitric oxide production.<sup>29</sup> In addition, regular physical activity is associated with improvement in high density lipoprotein cholesterol (HDL-C), and reduction in levels of total cholesterol, low density lipoprotein cholesterol (LDL-C), triglycerides and markers of inflammation such as C – reactive protein though we did not investigate for these in our study.<sup>29</sup> Thus, the beneficial effects of physical activity on cardiovascular disease risk reduction go beyond BP lowering.

We found the prevalence of prehypertension in our cohort to be 48%, a value that is higher than 32% found in those aged 18 to 39 years in the US.<sup>30</sup> This represents individuals in whom early intervention by adoption of healthy lifestyles could reduce BP, reduce the rate of progression of BP to hypertensive levels with age, or prevent hypertension entirely.<sup>14</sup> We did not find any person with significant urinary abnormalities. This may relate to the relatively small number of our cohort. In a study by Topham *et al*,<sup>31</sup> only 1% of 3570 university students had persistent urinary abnormality. The low prevalence of alcohol consumption and the absence of smoking in our study population may be due to the awareness of the participants of the adverse health implications of these social habits.

Our study had some limitations. First, the study cohort being our students may be regarded as a vulnerable one. However, the students were made to realize that no form of punishment will be meted out to those who refused to be part of the study and the entire cost of the study was borne by the investigators. Second, we did not investigate for the prevalence of microalbuminuria which may be an early marker of kidney disease.<sup>1</sup> However, there is likelihood that most of our participants with trace proteinuria have microalbuminuria.<sup>[32, 33]</sup> Sam *et al* [32] and Konta *et al* [33] in separate studies

demonstrated that trace proteinuria could be a useful indicator of microalbuminuria. Single episode dipstick positive proteinuria of e<sup>+</sup>1+ was chosen in this study because this level of proteinuria had been shown to be associated with increased risk for the development of end-stage renal disease (ESRD)<sup>[34, 35]</sup>. For example, Tozawa *et al* [34] demonstrated that baseline proteinuria of e<sup>+</sup>1+ was associated with a relative risk for the development of ESRD of 11.29 in men and 12.5 in women. Third, we cannot completely rule out “white coat effect” in our cohort and there is likelihood that the use of ambulatory blood pressure measurement (ABPM) may give lower prevalence of prehypertension and hypertension in this cohort.<sup>14</sup>

In conclusion, our study shows that prehypertension and hypertension were fairly prevalent in our university students. Thus, there is need to promote the initiation and sustenance of lifestyle modifications at an early age since this may help in the prevention of hypertension or progression of prehypertension to hypertension.

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## Renal Status of Patients with Cervical Cancer Prior to Treatment Commencement

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### ABSTRACT

The renal system is one of the body organs that are affected in advanced carcinoma of the cervix uteri. The aim of this study is to see the pattern and the prevalence of renal impairments seen in patients with cervical cancer presenting in our clinic prior to treatment.

One hundred and ninety nine consecutive patients with histological proven carcinoma of the uterine cervix who were referred to the Radiotherapy Department were enrolled in the study. All the patients had FIGO staging. Measurements of blood urea and creatinine and abdominopelvic ultrasound scan were done to assess their renal status.

Most of the patients (71.9%) were aged 50yrs and above. 116 (54%) presented at stages 3 and 4. In addition, 53 patients (26.9%) and 61 (26.2%) have raised blood urea and creatinine levels above normal respectively, whereas ultrasound scan abnormalities i.e. hydronephrosis and or hydrocalycosis were seen in 66 (33.2%), 26 (13.1%) had hydroureters and evidence of renal parenchymal disease were seen only in 19(9.5%).

Renal impairment was seen in more than a quarter of patients presenting with cancer of the cervix prior to treatment commencement. Renal assessment should therefore be an important pre-treatment work-up for all patients with cancer of the uterine cervix.

**Keywords:** *Renal impairment, cervical cancer*

### INTRODUCTION

Cervical cancer is the second most common malignancy in women worldwide, and it remains a leading cause of cancer-related death for women in developing countries. In the United States, it is the fourth most common malignant neoplasm in women, after carcinoma of the breast, colorectum, and endometrium [1]. The incidence of invasive cervical cancer has declined steadily in the United States over the past few decades. However, it continues to rise in many developing countries. The change in the epidemiological trend in the United States has been attributed to mass screening with Pap smears [2]. In Nigeria, cancer of the cervix is second only to cancer of the breast as seen in University College hospital, Ibadan [3,4].

The renal system is one of the first body systems to be directly affected by cancer of the cervix especially in advanced cases. Indeed renal involvement is regarded as a staging sign post in cervical cancer and patients with evidence of renal impairment as a result of cancer of the cervix are said to have stage 3b disease [5]. Unfortunately, most of our patients in Nigeria present at late stages and often have evidence of renal impairment at presentation [5]. Renal involvement also worsens the overall prognosis [6,7].

The aim of the present study is to characterise the prevalence and the pattern of renal impairment present in cervical cancer patients presenting at our department for the first time prior to treatment

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commencement. This is to see how this compares to findings in many previous studies done on the subject.

**MATERIALS AND METHOD**

One hundred and ninety nine consecutive patients with histological diagnosis of carcinoma of the uterine cervix were recruited for the study. One hundred and ninety three 193 patients had FIGO staging during examination under general anaesthesia.

All patients had their blood urea and creatinine measured to assess their renal status. They also had pelvic ultrasound to assess the state of their kidneys. Hydronephrosis, hydrocalycosis, hydroureters and evidence of renal parenchyma disease on ultrasound scanning were used to determine the state of the patients’ renal system. All patients with previously diagnosed hypertensive disorders and diabetes were excluded. None of the included patients volunteered any family history of chronic kidney disease

The collected data was analyzed with SPSS statistical programme for Mac OS X, version 16 and presented in tabular and chart form.

Biomedical values were obtained from the University College Hospital (UCH) Ibadan, laboratories and the laboratories’ normal reference values were used to determine the presence or absence of renal impairment. Creatinine levels above 1.5mg/100ml, urea levels above 45mg/100ml and the presence of Hydronephrosis, hydrocalycosis, hydroureters and renal parenchyma disease on ultrasound were used as indicators of renal impairment.

Patients’ bio data including the age were also noted. A brief review of relevant literature was also done

**RESULTS**

All the 199 patients’ records concerning the age and the ultrasound assessment were available for analysis. However only 187 patients had records of their creatinine levels, while 197 had blood urea level records available for analysis. The missing laboratory values were due to logistic reasons including clotted samples and power failure.

The patients’ ages ranged from 31 years to 90 years with a mean age of 56.53. Most of the patient (71.9%) were 50 years and above while only 9% were below 40 years.

Only 193 of the patients had staging information available. One patient presented with stage 0 (She

was diagnosed following a routine pap smear examination). Nine patients (7.3%) were in stages 1 (a and b) , 74 patients (38.3%) presented with stages 2 (a and b) while the remaining 116 (54.4%) presented at stages 3 and 4.

**Renal Status**

66 of the 199 patients (33.2%) had evidence of Hydronephrosis and or hydrocalycosis, 26 (13.1%) had hydroureters while only 19 (9.5%) had evidence of renal parenchyma disease. (Tables 1)

The result is slightly different when we analysed for patients with stages 3 and 4 only. Table 2

**Table 1:** Ultrasound evidence of renal impairment

Variable	Hydronephrosis and Hydrocalycosis	Hydroureter	Renal Parenchymal Disease
Present (%)	33.2	13.1	10.1
Absent (%)	66.8	86.9	89.9

Urea levels were within normal limits of 45 and below in 144 (73.1%) of the 197 patients . However, 53

**Table 2:** Ultrasound evidence of renal impairment in patients in stages 3 and 4

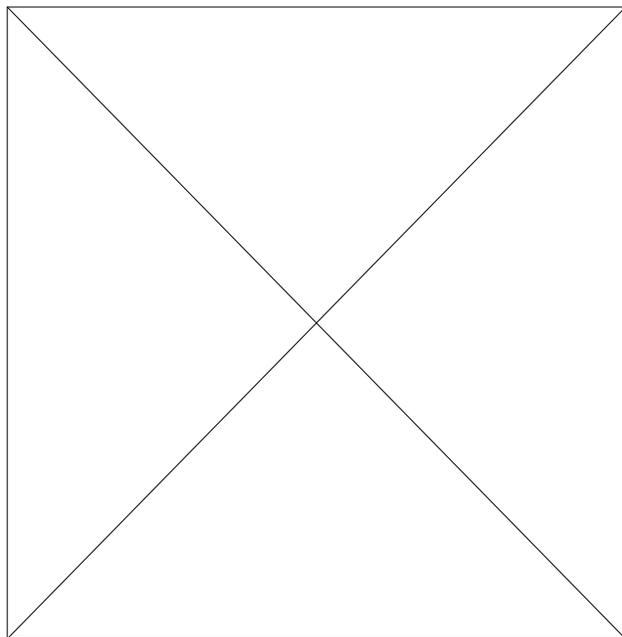
Variable	Hydronephrosis and Hydrocalycosis	Hydroureter	Renal Parenchymal Disease
Present (%)	50.5	22.9	18.1
Absent (%)	49.5	77.1	81.9

**Table 3:** Creatinine levels in the patients

Creatinine Levels (mg/dl)	Frequency (%)
1.5 and below	73.8
1.6-2.5	9.6
2.6-5.5	10.7
5.6-10	5.3
Above 10	0.5

(26.9%) had urea levels above normal values. (Figure 1)

**Fig. 1:** Bar Chart Showing Urea Levels in the Patients



Also 138 (73.8%) of 187 patients had creatinine levels of 1.5mg/100ml and below. The rest have raised levels of 1.6mg/100ml and above. (Table 3)

## DISCUSSION

The uterus is a pelvic organ. It comprises of the uterine body and the uterine cervix, which is the lower one third that enters the vagina. The uterine cervix is closely related to pelvic ureters which run close to its lateral margins [8]. Cervical carcinoma spreads predominantly by direct invasion and lymphatic permeation. Direct spread is superiorly into the body of the uterus, inferiorly into vaginal mucosa and laterally to the parametrium and pelvic sidewalls as well as the ureters [9].

The urinary system is the principal organ system responsible for water and electrolyte homeostasis. It provides the mechanism by which excess water and electrolytes are eliminated from the body. It also excretes toxic metabolic waste products. The end products of these processes being urine production [10]. In addition, detoxification and elimination of drugs, control of red blood cell mass through production of erythropoietin, endocrine control of

mineral metabolism, and maintenance of acid base balance are other important functions of the kidneys [11].

Many studies have shown that the presence of renal impairment in patients with carcinoma of the cervix is a poor prognostic indicator [6]. Patient with evidence of renal impairment relating to the cervical cancer are said to be stage 3b according to the widely used International Federation of Obstetrics and Gynaecology (FIGO) staging for cancer of the uterine cervix [12].

Michael *et al*, reviewed prognostic factors for advanced squamous cell cancer of the cervix and reported that 29% of patients have ureteral obstruction. A similar study carried out in this centre by Komolafe *et al*, showed that obstructive urographic changes were present in 46% of cases of histologically diagnosed cervical cancer. This is three times higher than the value seen in Caucasian population [14].

Frohlich *et al* have shown the usefulness of ultrasonography in the diagnosis of ureteral obstruction that occurs in cervical cancer patients. He established that ultrasound is as sensitive as intravenous pyelography in detecting ureteral obstruction [15]. The use of ultrasound has also been advocated as it has higher resolution than intravenous pyelography. Pyelography on the other hand is superior to ultrasonography since it offers greater evidence about the functional state of the kidney. However, cost and the non-invasive nature of ultrasonography are important considerations in our environment [16].

There are many non-malignancy related causes of renal impairment in patients. These include uncontrolled hypertension, diabetes mellitus etc. These were excluded in the patients that we studied [17]. Our results showed that up to 30% or close to one third of all patients presenting with cancer of the uterine cervix have evidence of impaired renal functions. This figure increased to more than 50% in patients with diseases in stage 3 and above.

As earlier indicated, the kidney is important in the production of red blood cells. Red blood cells are important in making molecular oxygen available to all parts of the body including the tumour. Radiobiological evidence has shown that tumour cells that are poorly oxygenated are more resistant to the effect of radiation therapy [18]. It is therefore obvious that in addition to the problem associated with renal insufficiency, cervical cancer patient with renal

impairment are likely to have poorer outcome from radiation treatment due to potential radioresistance from reduced oxygen in the system.

### CONCLUSION

Our study, in line with some previous works on the subject has demonstrated high proportion of patients with renal impairment among people presenting with cancer of the cervix in our clinic. We therefore recommend that all patients presenting with cervical cancer should have renal assessment done with ultrasonography, electrolyte, urea and creatinine estimations and where significant renal insufficiency is demonstrated, renal consultation should be requested prior to treatment commencement.

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# State of the Art: “Hemodialysis” Dose and Survival in Acute Kidney Injury

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## INTRODUCTION

Acute kidney injury is increasingly being recognized as an independent correlate of poor outcomes, especially in hospitalized patients [1,2,3,4]. The incidence of AKI varies widely across different studies from different countries, in part due to different definitions and terminology [5]. There are very active efforts to establish both pharmacological and non-pharmacological therapeutic options for AKI. However, currently the only approved treatment for established AKI by the US Food and Drug Administration is dialysis [6]. A minimum standard dose of dialysis has been established for patients on maintenance dialysis for ESRD (End Stage Renal Disease). This paper is a review of such efforts to determine the minimum effective dose of “hemodialysis” that has a positive effect on mortality in AKI patients. Some of the studies reviewed used hemofiltration solely or in combination with hemodialysis as therapy.

## Definition of Acute Kidney Injury

There have been various attempts to have a unanimous definition of acute kidney injury (AKI) [7,8]. Various clinicians and investigators have defined AKI as “an increase in creatinine  $>0.5\text{mg/dl}$ ”, others have termed it “an increase in serum creatinine concentration  $>50\%$  or decline in creatinine clearance by  $50\%$ ” while some definitions involves classifying AKI into stages based on severity [11]. Two major

classification systems have been developed in an effort to standardize the definition of AKI.

The RIFLE criteria which classifies AKI into 5 stages; Risk, Injury, Failure, Loss, ESRD, [8] has been validated in various settings and has led to some clear standardization in the definition of AKI while the AKIN staging system is also similar to the RIFLE criteria and utilizes the same parameters, rise in serum creatinine and urine output to categorize AKI into three stages, AKIN 1, 2 and 3[7]. Although these systems may be validated, applying them in daily clinical practice is often cumbersome and many times impractical .

## The RIFLE classification of AKI

There have been close to 35 different definitions used in the literature to define AKI [45] with no consensus on how AKI should be defined. This has led to difficulty with comparing studies and quantifying the incidence, prevalence and outcome associated with AKI. In 2004, the Acute Dialysis Quality Initiative convened an international interdisciplinary group that proposed the RIFLE criteria for definition of AKI[8]. Various studies have also validated the RIFLE criteria across diverse patient populations and hospital settings[4,46-49]. The RIFLE criteria consists of 5 stages with the first three stage representing stages of increasing severity (Risk, Injury and Failure) while the final two stages are outcome groups (loss and ESRD). It has been used increasingly in medical

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literature and is very useful in comparing or combining data across studies.

Hoste *et al* [2] reviewed studies using the RIFLE criteria to define AKI. The studies were easily

(NKF), International Society of Nephrology (ISN) and the European Society of Intensive Care Medicine met in September 2005 in Amsterdam, Netherlands and proposed a definition and staging system for AKI known as the AKIN classification of AKI [7]. The

The RIFLE Classification

	GFR/Creatinine criteria	Urine Output criteria
<b>Risk</b>	Increase in creatinine x1.5 Or GFR decrease >25%	UO < .5ml/kg/hr for 6hrs
<b>Injury</b>	Increase in creatinine x 2 Or GFR decrease >50%	UO < .5ml/kg/hr for 12hrs
<b>Failure</b>	Increase in creatinine x 3 Or GFR decrease >75%	UO < .3ml/kg/hr for 24 hrs or Anuria for 12hrs
<b>Loss</b>	Persistent ARF = complete loss of renal function > 4 weeks	
<b>ESRD</b>	End Stage Renal Disease > 3 months	

comparable because they all used the same criteria to define AKI. They found that increasing RIFLE stage was associated with increasing mortality in most studies and that AKI patients treated with renal replacement therapy had a mortality rate as high as 50-60%.

**The AKIN classification of AKI**

The Acute Kidney Injury Network (AKIN), an independent collaborative network of experts from various societies including Acute Dialysis Quality Initiative (ADQI) group, American Society of Nephrology (ASN), National Kidney Foundation

AKIN group defined AKI as “an abrupt (within 48 hours) reduction in kidney function currently defined as an absolute increase in serum creatinine of more than or equal to 0.3mg/dL, a percentage increase in serum creatinine of more than or equal to 50% (1.5-fold from baseline), or a reduction in urine output (documented oliguria of less than 0.5ml/kg per hour for more than six hours)”.

Lopes *et al* [9] conducted a retrospective study to analyze clinical characteristics of septic AKI using the AKIN classification and to assess its ability to predict in-hospital mortality of patients with sepsis. The study found the AKIN criteria as a simple and

The AKIN Classification

Stage	Serum creatinine criteria	Urine output criteria
1	Increase in creatinine e0.3mg/dL or increase eH150% to 200% from baseline	Less than 0.5ml/kg per hour for more than 6 hours
2	Increase in creatinine >200% to 300% (>2-to 3-fold) from baseline	Less than 0.5ml/kg per hour for more than 12 hours
3	Increase is creatinine >300% (3-fold) from baseline or serum creatinine of more than or equal to 4.0mg/dL with an acute increase of at least 0.5mg/dL for 24 hours or anuria	Less than 0.3ml/kg per hour for less than 12 hours

valuable tool in characterizing and stratifying septic patients according to the risk of death.

The fact that a clear definition is pivotal in identifying a condition and managing outcomes cannot be overemphasized. Contrast induced acute kidney injury on the other hand has been clearly defined as “a rise in creatinine greater than 0.5mg/dl or >25% rise in creatinine from baseline” [10] and this clear cut definition has led to earlier diagnosis of the condition and may lead to better outcomes.

The definition criteria used to define AKI could lead to significantly different incidence figures for AKI. Chertow *et al* [11] demonstrated that the criteria used to define AKI can lead to wide variation in the incidence of AKI and odds of mortality associated with AKI. The authors applied nine different but commonly used definitions to define AKI with a serum creatinine of  $\geq 0.3$ mg/dL being the most sensitive and a serum creatinine  $\geq 2.0$ mg/dL as the most specific definition. The prevalence of AKI depending on the definition varied from 1 to 44% and mortality associated with AKI ranging from an odds ratio of 4.1 to 16.4. In the study, when AKI was defined as rise in serum creatinine of  $\geq 0.5$ mg/dl, the incidence of AKI and odds ratio for mortality were 12% and 6.5 as opposed to 0.5% and 16.4 if the criteria was  $\geq 2.0$ . This shows the wide variation in incidence data and outcomes associated with the lack of a universally accepted and practiced definition of AKI.

### **Epidemiology of Acute Kidney Injury**

The prevalence and hospital mortality associated with AKI in various regions of the world vary significantly [5]. Single center studies [12-18] have given estimates between 1% and 25% while multicenter studies [19-26] gave estimates as high as 39 - 71%. The use of different criteria for AKI definition may explain the wide variation in prevalence estimates. Most studies on AKI prevalence and outcome were conducted in Europe, North America and Australia.

Considering the paucity of data on the epidemiology and outcome of AKI in other regions of the world, Uchino *et al* [5] conducted a large multi-center study in 23 countries to determine the prevalence of AKI in the ICU and determine factors which impact patient outcomes. The criteria for AKI in the study were oliguria of less than 200 mL in 12 hours and/or marked azotemia defined as defined as a blood urea nitrogen level higher than 84mg/dL. This definition unfortunately does not readily correlate with the AKIN classification of AKI, the RIFLE criteria

or percentage/quantitative rise in creatinine as often used in clinical practice. Countries included in this study were mainly in Europe and North America, although centers in Asian and South American nations were also included. A total of 1738 of the 29,269 critically ill patients included in this study developed AKI requiring renal replacement therapy (RRT) during their hospital stay. This places the prevalence of AKI at 5.7% although there was considerable variation in the figure from country to country (United Kingdom: 20.6% and Israel: 2.1%). The overall hospital mortality was 60.3% with septic shock as the most common contributing factor to AKI (47.5%), major surgery (34.3%), cardiogenic shock (26.9%) and hypovolemia (25.6%).

Anochie *et al* [27] studied the prevalence, etiology, management and outcomes of AKI in children in Southeastern Nigeria. A total of 211 patients were enrolled with ages between 5 days and 16 years. Oliguria was the most common clinical feature (87.2%). The hospital prevalence was estimated at 11.7 cases/year. Birth asphyxia accounted for 35.5% of the AKI cases, Septicaemia (22.4%), gastroenteritis (28.9%), malaria (13.7%), congenital malformations (14.5%) and tetanus (5.3%). There was an indication for dialysis in 108 patients but only 24 patients received renal replacement therapy in the form of peritoneal dialysis due to lack of financial resources and dialysis equipment. Mortality rate was as high as 40.5%. Hypertension, lack of dialysis, delayed presentation, herbal medication use and lack of finances significantly affected outcomes negatively. Olowu and Adelusola [28] prospectively studied the prevalence, etiology and outcomes of AKI in children in Southwestern Nigeria. A total of 123 patients were studied while only 10 had dialysis (Peritoneal dialysis: 7 and hemodialysis: 3). Patients were enrolled over a 9 year period with a mean age of 6.28 years. The overall mortality associated with AKI was also as high as 46.2% which is similar to the study in southeastern Nigeria with factors such as financial limitations, inadequate or lack of dialysis equipment and late presentation as significant factors in such high mortality figures.

### **Mortality in Acute Kidney Injury**

AKI has been suggested to be an independent risk factor for mortality [1]. Often times, AKI exists in a background of life threatening illnesses and this also contributes or may be responsible for the high mortality associated with AKI [1]. Co-morbid

conditions that are associated with AKI may also necessitate procedures such as radiocontrast exposure and surgery leading to blood loss and hypotension thus increasing the risk of renal injury. The exact contribution to mortality played by AKI or the underlying conditions is not very clear.

Levy *et al* [1] conducted a large study to test the hypothesis that underlying conditions account for the high mortality rate in AKI. The study involved 16248 inpatients who underwent radiocontrast studies between 1987 and 1989. The mortality rate in patients with AKI was 34% compared to 7% in patients without AKI with the odds ratio of death in patients with AKI being 5.5 after adjusting for differences in comorbidity. This study goes to prove that AKI is an independent risk factor for mortality and that the underlying conditions alone cannot explain the high mortality rate associated with AKI.

The mortality rate associated with AKI is dependent on the severity of the underlying conditions, if any, and the location in the hospital. For instance, AKI in the absence of any other co-morbid condition is associated with a mortality of 7 to 23% while in the ICU; the mortality is as high as 50 to 80%. Also survival after AKI is largely dependent on number of failed organs with mortality less than 40% if there is no organ failure as opposed to a mortality rate of greater than 80% if 3 or more organs have failed.

### **Acute Kidney Injury and Dialysis**

Acute Kidney Injury is a condition with very diverse etiology, a spectrum of disease staging and occurs through different pathophysiologic pathways. Many agents have been used to treat AKI with limited success. Some agents may be more efficacious if started before the injury. Diuretics, low dose dopamine, mannitol, theophylline, prostaglandins, natriuretic peptides, saline and N-acetylcysteine are part of the long list of agents that have been used to treat AKI with limited success [29]. However, as it stands, the only United States Food and Drug Administration approved treatment for Acute Kidney Injury (AKI) is dialysis [6]. The indication for dialytic intervention in the ICU/critical care patients include but are not limited to hyperkalemia, acidemia, uremia, volume overload, toxin removal, and as support modality for fluid management in multi-organ failure. There has been so much debate on the frequency, dose, modality and timing of dialysis initiation that will yield the best patient outcomes. Unfortunately, there is often no single answer to these issues because unstable patients in the critical care setting often have

varied concomitant conditions (e.g. sepsis, acute lung injury) that could influence the dialysis prescription. Significance of increased fluid intake in the form of medication, blood products, total parenteral nutrition as well as high catabolic rate in these unstable patients have to be considered in deciding the choice of dialysis modality, dose, frequency and time of initiation. Intermittent hemodialysis is often poorly tolerated in unstable patients in the critical care setting with continuous venovenous hemodialysis associated with less hemodynamic instability and possibly improved survival via more efficient removal of immunomodulatory substances. Although there are a few studies out there that try to answer questions such as; what is the optimal dose for hemodialysis? When should hemodialysis be initiated? Is daily intermittent hemodialysis superior to alternate day hemodialysis? Is a continuous regimen hemodialysis associated with better outcomes when compared to intermittent daily hemodialysis, there is still a lack of consensus on the optimal treatment of critically ill patients with acute kidney injury.

Venkataraman *et al* [30] retrospectively studied the dosing patterns of continuous renal replacement therapy (CRRT) in patients with AKI and discovered that the dose of CRRT delivered in most patients is lower than the prescribed dose. Clotting of the system played a major role in the lower delivered dose while hemodynamic instability was not a factor.

The optimal time to initiate dialysis is still debatable. Aggressive and early initiation could be associated with prolonged duration of AKI, decreased urine output, complement activation and hypotension. On the other hand delaying dialysis may be associated with complications such as volume overload from bicarbonate infusion or poor nutrition due to fluid restriction.

Many large studies have been conducted to give answers to the optimal dose, frequency and time of initiation of dialysis for better patient outcomes. Gillium *et al* study [31] is one of the earlier studies on the role of intensive dialysis in acute renal failure. This was a prospective study carried out on 34 patients whom were paired by acute renal failure etiology and treated with sufficient dialysis with the goal of maintaining predialysis blood urea nitrogen and serum creatinine below either 60 mg/dl and 5mg/dl (intensive treatment group) or 100mg/dl and 9mg/dl, respectively (less intensive group). The results of the study that the overall complication rates were not different

between the two groups. The mortality rates were not significantly different between the two groups; 58.8% in the intensive group and 47.1% in the non-intensively dialysed group. This study thus preceded other larger studies on dialysis dose and survival.

Ronco *et al* [32] undertook a randomized prospective study of the impact different ultrafiltration (UF) doses in continuous renal replacement therapy on patient survival. 425 patients with AKI admitted to two different intensive-care units of the same institution were enrolled in the study. Patients were enrolled over a five year period and the mean age of the study population was 61 years. The patients were randomly assigned to receive an ultrafiltration treatment at one of three doses: 20mL/kg/h (group 1); 35mL/kg/h (group 2); or 45mL/kg/h (group 3). The primary endpoint was survival at 15 days after stopping ultrafiltration. Rate of recovery of renal function and frequency of complications during treatment were also assessed. The results showed that survival in the group which received a UF dose of 20mL/kg/h was significantly lower than that of groups 2 ( $P=0.0007$ ) and 3 ( $P=0.013$ ). However, survival in the groups that received a UF dose of 35mL/kg/h did not differ from those that received a dose of 45mL/kg/h ( $P=0.87$ ). There was no change in the pattern of differences amongst groups after adjustments for possible confounders were made. Full recovery of renal function was as high as 95%, 92% and 90% in groups 1, 2 and 3 respectively while frequencies of complications were similar and low across all three groups. This study thus suggests that increasing the dose of ultrafiltration for critically ill patients with AKI improves survival significantly. Hence, they recommended a minimal ultrafiltration dose of 35mL/kg/h for critically ill patients with AKI. Saudan *et al* [33] also studied the effect of dialysis dose on survival. It was a three year prospective randomized trial with the hypothesis that an increase in dialysis dose achieved by continuous veno-venous hemodiafiltration (CVVHDF) is associated with a better survival when compared to continuous veno-venous hemofiltration (CVVH). 206 patients critically ill patients with AKI were randomized into 2 groups: CVVH (1-2.5l/h replacement fluid) or CVVHDF (1-2.5l/h replacement fluid + 1-1.5l/h dialysate). Outcome measures assessed were 28 and 90 day mortalities, renal recovery and duration of ICU stay. The 28-day ( $P=0.03$ ) and 90-day ( $P=0.0005$ ) survivals were significantly better in the CVVHDF group compared to the CVVH group. The result supports

the Ronco study and suggests that increasing the dialysis dose in severely ill patients with AKI, improves survival.

Tolwani *et al* [34] studied the effect of dosage of continuous venovenous hemodiafiltration (CVVHDF) on survival in patients with acute renal failure. 200 critically ill patients with AKI were randomly assigned to receive CVVHDF at either a high dose of 35ml/kg/hr or a standard dose of 20ml/kg/hr. The primary outcome was survival to the earlier of either intensive care unit discharge or 30 days. Outcome rate in the high dosage group was 49% while that in the standard dosage group was 56% ( $P=0.32$ ). Renal function recovery amongst hospital survivors was also similar. 69% of those in the high dosage group and 80% of those in the standard dosage group recovered renal function ( $P=0.29$ ). The results thus did not show a difference in patient survival or renal recovery between patients receiving high dose CVVHDF or standard dose CVVHDF.

Schiffl *et al* [35] studied the role dialysis frequency had to play in the survival of patients with AKI. It was a prospective study comparing the effect of daily intermittent hemodialysis as opposed to intermittent (alternate day) on survival among patients with AKI. A total of 160 patients with AKI in the medical and surgical intensive care units were assigned in alternating order to receive either daily or intermittent hemodialysis for AKI over a 5 year period. The primary endpoint of the study was survival while duration of AKI and the frequency of therapy-related complications were secondary endpoints. The baseline characteristics including APACHE (Acute Physiology, Age and Chronic Health Evaluation) III scores between the two groups were similar. There was better control of uremia, fewer episodes of hypotension during hemodialysis and more rapid resolution of AKI in the daily hemodialysis group as opposed to the intermittent hemodialysis group ( $P=0.001$ ). The mortality rate was also significantly different between the 2 groups; 28% in the daily hemodialysis cohort and 46% in the intermittent hemodialysis cohort ( $P=0.01$ ). This study supports the hypothesis that more intensive hemodialysis through more frequent sessions is associated with reduction in mortality in critically ill patients with AKI and is not associated with increased incidence of hemodynamically induced morbidity. This study thus supports the argument that more hemodialysis is better especially in patients with AKI. The limitation of practicing daily hemodialysis is that it has huge

financial and staffing implications. Also, the mortality in the intermittent hemodialysis cohort was 46%, a rate that is lower than most studies on AKI in severely ill patients in ICU's. The lower rate may be explained by the fact that the patients in Schiffel et al's study were less severely ill and most patients were not oliguric at the time of enrollment. Nevertheless, daily hemodialysis may be superior to alternate-day hemodialysis because it is associated with less dramatic variation in plasma concentrations of solutes and cytokines, a reduced requirement for fluid removal and thus less hemodynamic instability. Less severe instability may be associated with lower incidence of ischemia.

Gettings *et al* [36] assessed the role of timing of initiation of continuous renal replacement therapy (CRRT) had to play on outcomes in patients with post-traumatic AKI. It was a retrospective study that characterized the patients as either early or late starters based upon whether the blood urea nitrogen was less than or greater than 60mg/dL prior to CRRT initiation. CRRT was thus initiated earlier in early starters as compared to late starters. The 2 study groups were however similar with respect to Injury Severity Score, admission Glasgow Coma Score, presence of shock at admission, age, gender distribution and trauma type. The results showed that survival rate was significantly higher in early starters as compared to late starters (39.0 vs 20.0%,  $P=0.041$ ) suggesting that an earlier initiation of CRRT in patients with AKI may improve survival.

Bouman *et al* [37] studied both the role of time of initiation of continuous venovenous hemofiltration and the dose (ultrafiltration rate) of hemofiltration on mortality and renal function recovery. It was a randomized, controlled two-center study on 106 ventilated severely ill patients with AKI. The patients were randomized to either of 3 groups; early initiation of high-volume hemofiltration (72-96L/24hrs), early initiation of low volume hemofiltration (24-36L/24hrs), and late low-volume hemofiltration (24-36L/24hrs). Survival at 28 days ( $P=0.80$ ) and median duration of renal failure ( $P=0.25$ ) were similar amongst all three groups. The study thus concludes that in severely ill patients with oliguric AKI, survival at 28 days and recovery of renal function were not improved by the use of higher hemofiltration dosage or earlier initiation of hemofiltration.

The Veterans Affairs/National Institutes of Health (VA/NIH) Acute Renal Failure Trial Network Study [38] is a multicenter, prospective, randomized trial of the intensity of renal replacement therapy in

critically ill patients with AKI conducted in 27 VA and university-affiliated medical centers in the United States. 1124 critically ill patients with AKI were randomly assigned to receive either an intensive or less intensive renal replacement therapy. In both strategies, hemodynamically stable patients received intermittent hemodialysis while unstable patients underwent continuous veno-venous hemodiafiltration (CVVHDF) or sustained low-efficiency dialysis (SLED). The intensive treatment strategy entailed intermittent hemodialysis and SLED six times a week and CVVHDF at 35mL/kg/h while the less intensive treatment strategy intermittent hemodialysis and SLED three times a week and CVVHDF at a lower dose of 20mL/kg/hr. The primary endpoint of the study was death from any cause by day 60. The results showed that there was no significant difference between the two groups with respect to the death from any cause by day 60 (OR: 1.09,  $P=0.47$ ), duration of renal replacement therapy, rate of recovery of kidney function or nonrenal organ failure. Hence this large, recent and landmark study refuted all earlier studies and suggests that intensive strategy of renal replacement therapy in severely ill patients with AKI does not decrease mortality as compared to a less intensive strategy.

The unique feature of the VA/NIH study as compared to other studies is that it allowed patients to move from one mode of renal replacement therapy to another as long as they stayed within the originally assigned intensive or less intensive treatment group. Although the VA/NIH did not show the benefit of increasing intermittent dialysis treatments to five to six times per week, it however did not disprove the fact that dose does matter. Since the targeted standard dialysis dose in the study was greater than what is often achieved in intermittent hemodialysis, increasing the dose further did not show any significant difference in outcomes. Hence, the VA/NIH study suggests that increasing the frequency of intermittent hemodialysis more than three times per week, in hemodynamically stable patients, with a target achieved  $Kt/V_{urea}$  of 1.2 to 1.4 per treatment or provision of continuous renal replacement therapy to hemodynamically unstable patients at a dose higher than 20ml/kg/hr was not associated with improved outcomes.

While there has been so much debate on the optimal dose of dialysis in patients with AKI, there has been a lot of variation in the practice from country to country and even amongst ICU's in the same

country. Uchino and colleagues [39] studied the practice of continuous renal replacement therapy (CRRT) for treatment of AKI and possible clinical effect of practice variation amongst 54 ICU's in 23 countries. The results showed that the (CRRT) practice varied significantly across the units did not follow best evidence.

Kellum's meta-analysis [40] of four major studies [32, 33, 35, 37] which addressed dosing of hemodialysis and survival outcome showed a significant survival advantage in favor of a higher dosing (OR:1.95, P<0.001). The pooled studies were homogenous (Q statistic 1.73, P=0.63).

### CONCLUSION

There have also been extended alternatives to continuous renal replacement therapy. Pulse high-volume hemofiltration as an adjuvant treatment of severe sepsis is a new modality which aims at much higher doses of hemofiltration at rates up to 120ml/kg over short periods (6-8hours/day) and is associated with improved hemodynamics pre- and post-treatment and may have patient survival benefits [41].

Extended daily dialysis refers to the use of conventional hemodialysis daily at slow flow rates over an extended treatment time. In comparison to continuous venovenous hemofiltration, extended daily dialysis has the advantage of requiring less anticoagulation and less nursing care, easier to perform and offers the same benefits provided by continuous venovenous hemofiltration such as hemodynamic stability and volume control[42,43]. Sustained low-efficiency dialysis is also another dialysis treatment strategy in critically ill patients and involves use of the conventional hemodialysis setup to achieve hemodialysis at reduced dialysate and blood flow rates [44].

As we await the publication of the RENAL (Randomized Evaluation of Normal vs. Augmented Level of renal replacement therapy in ICU) study results which is the largest ever continuous renal replacement therapy trial completed there is still a lack of agreement on the optimal dose of dialysis for critically ill patients with AKI.

The best evidence that exists supports the use of at least 35ml/kg/hr dialysis dose for CVVH (Continuous Venovenous Hemofiltration), CVVHDF (Continuous Venovenous Hemodiafiltration) or daily hemodialysis.

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## Estimation of Dry Weight in Children with Oedematous Nephropathy

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### ABSTRACT

Nephrotic syndrome (NS) and acute glomerulonephritis (AGN) are two leading childhood renal disorders in the tropics that present commonly with oedema and therefore increased weight. Knowledge of the dry weight of oedematous patients will provide more objective assessment of the degree of fluid retention and would also guide fluid electrolyte and drug management.

All children admitted for NS and AGN to the Paediatric Nephrology Unit of University of Ilorin Teaching Hospital, Ilorin between 2004-2008 were recruited for the study. For each child, the oedematous weight was recorded at admission and the dry weight was determined when the oedema became clinically undetectable. The oedema and dry weight were computed and compared. The weight differential and percentage losses for each patient were also computed. A formula for estimation of dry weight in the oedematous nephropathy was then derived. A total of 37 children were recruited for the study comprising 31 males and 6 females giving a male/female ratio of 5.2:1. Thirty-three children were diagnosed as NS; the other four children had AGN. The weight range among all the NS children was 12.0-68.0 kg while that among the AGN was 12.0-33.7 kg. Oedematous weight of the children with NS ranged from 12.0-68.0 kg while that of children

with AGN ranged from 12.0-33.7 kg. Dry weight among children with NS was 10.0-53.1kg, while that among children with AGN was 11.5-30.0kg. Weight loss among children with NS ranged from 1.2-21.0kg (percentage weight loss 4.8-43.5%) and among children with AGN, weight loss was 0.5-5.2kg (percentage weight loss 4.2-26.4%). Based on the mean weight loss, a formula ( $n-0.18n$  or  $n-0.2n$ ) was proposed for children with NS while the formula ( $n-0.13n$  or  $n-0.1n$ ) was proposed for children with AGN. The formula for the estimation of dry weight among children with NS and AGN was ( $n-0.2n$ ) and ( $n-0.1n$ ) respectively where  $n$  is the oedematous weight. The formula for the estimation of dry weight in all children with oedematous nephropathy was ( $n-0.176n$  or  $n-0.2n$ ).

### INTRODUCTION

Nephrotic syndrome and acute glomerulonephritis are two leading childhood renal disorders in the tropics that present commonly with oedema and increase in weight [1-3]. The weight gain which is due to fluid retention makes accurate drug dosing and estimation of fluid and electrolyte requirements difficult. Most times, we have had to resort to the use of the oedematous weight or the formula estimated weight for age with the risk of either overdosing or

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underdosing of drugs. Dry weight would be more useful for pharmacological prescription and fluid and electrolyte management because the presence of oedematous nephropathy implies some degree of renal dysfunction, hence drugs excreted by the renal route, fluids and electrolytes should be administered with caution. Furthermore, some oedematous nephropathies can progress to either acute or chronic renal failure. Hence, every proactive measure should be put in place at the earliest possible time. This is pertinent in resource poor countries like ours, where renal replacement therapy are either not readily available or if available, not affordable by most of our teeming population.

Accurate estimation of the dry weight of patients and consequently the degree of fluid retention will have bearing on drug dosage, fluid and electrolyte management of patients. This study attempts to determine the dry weight in children with AGN and NS.

**MATERIALS AND METHODS**

All oedematous children with diagnosis of NS and AGN who were admitted to the Paediatric Nephrology unit of the University of Ilorin Teaching Hospital, Ilorin between 2004-2008 were recruited for the study. Patients undergoing haemodialysis or who have oedema due to other causes other than NS and AGN were excluded. Patient who became dehydrated when oedema was not clinically detectable were also excluded. Nephrotic syndrome was diagnosed by the presence of anasarca, massive proteinuria >2gms/24hours, hypoalbuminaemia-serum albumin <2.5g/dl and hypercholesterolaemia- >5.17 mmol/l while AGN was diagnosed by the presence of haematuria, hypertension, proteinuria and azotaemia. The patients with NS were managed with either of frusemide or thiazide diuretics and spironolactone depending on the severity of the oedema. They were also managed with oral steroid therapy in form of prednisolone at 2mg/kg up to a maximum of 60 mg daily in three divided doses after achieving dryness. The duration of the steroid therapy in each patient varied depending on the response. Those who were steroid responsive received the drug for 8 weeks on alternate day after an initial one month daily dosage therapy to induce remission. For those who were steroid resistant, renal biopsy was done before introduction of cytotoxic drug. The AGN patients were placed on diuretics to control the oedema, parenteral hydralazine if there was severe hypertension or captopril or nifedipine if the

hypertension was less severe. An antibiotic was offered for the throat or skin infection, while the acute renal insufficiency was managed conservatively.

Patient's oedematous weight was determined on admission while the dry weight was determined when oedema became clinically undetectable. The age, sex and estimated weight for age in kilogramme using (the formula  $2n+8$  if the child is less than 5years and  $7n-5/2$  if the child is > 5years, where n is age in years) [4] were noted.

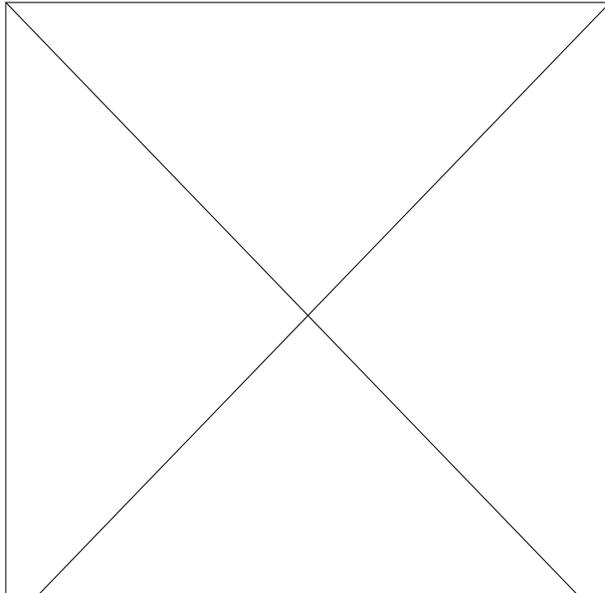
The oedema weight and dry weight were computed and compared with estimated weight for age. The weight differentials were also computed for each patient and percentage losses were derived.

**Table 1:** Clinical characteristics of all the children with oedematous nephropathy

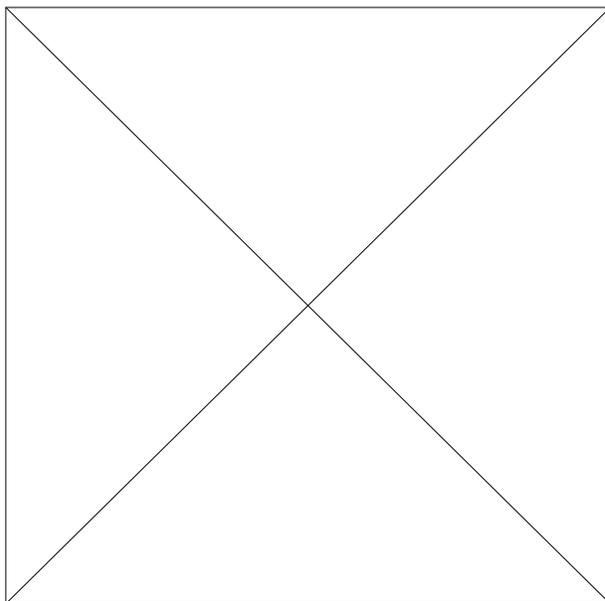
Clinical characteristics	Study population N=37
<b>Age (years)</b>	
Range	2.0-15.0
Mean (SD)	8.9±4.0
<b>Wt. at adm.(Kg)</b>	
Range	2.0-68.0
Mean(SD)	30.5±14.6
<b>Dry wt.(Kg)</b>	
Range	10.0-53.1
Mean(SD)	25.2±12.4
<b>Estimated Wt.for age(Kg)</b>	
Range	12.0-50.0
Mean (SD)	30.1±12.3%
<b>Estimated wt. for age</b>	
Range	54.3-123.4
Mean(SD)	83.9±15.8%
<b>Dry weight</b>	
Range	81.0-184.0
Mean(SD)	124.7±24.8
<b>Duration of oed. (days)</b>	
Range	5.0-35.0
Mean(SD)	14.1±7.2
<b>Wt. loss(Kg)</b>	
Range	0.5-21.0
Mean(SD)	5.3±4.2
<b>% Wt.loss</b>	
Range	4.2-43.5
Mean(SD)	17.6±9.8

## RESULTS

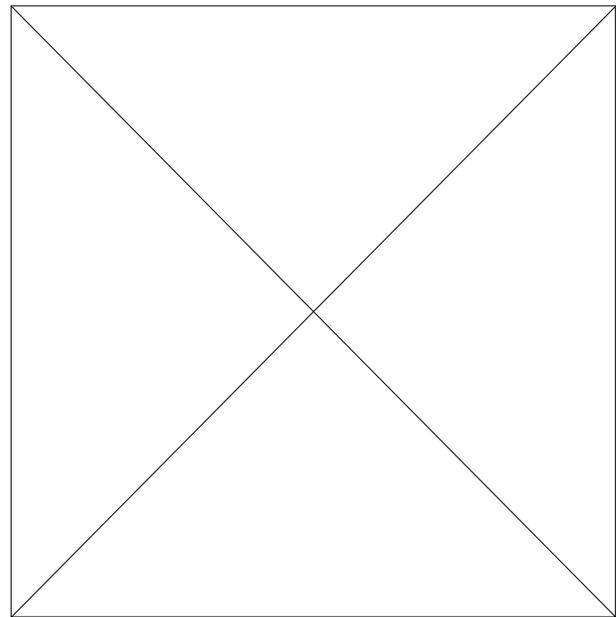
A total of 37 patients were recruited for the study. There were 31 males and 6 females giving a male/female ratio of 5.2: 1. The ages ranged from 2-15



years with a mean (SD) of  $8.9 \pm 4.0$  years. The children with nephrotic syndrome were aged 2-15 years with a mean of  $9.1 \pm 4.1$  years. The age range for patients with AGN was 3-13 years with a mean of  $7.3 \pm 4.4$  years. A total of 33 children were diagnosed as NS, while the other 4 patients had AGN.



The children weighed 12.0-68.0kg (mean of  $30.5 \pm 14.6$ kg) on admission, while the dry weight for all the patients was 10.0-53.1kg (mean of  $25.2 \pm 12.4$ kg). Weight loss among all the children



ranged from 0.5-21.0kg (mean of  $5.3 \pm 4.2$ kg) giving a percentage weight loss of 4.2-43.5% with a mean of  $17.6 \pm 9.8\%$ . The duration of oedema while on admission ranged from 5-35 days with a mean of  $14.1 \pm 7.2$  days (Table 1).

Children with NS weighed 12.9-68.0 kg (mean  $31.5 \pm 14.9$ kg), while the patients with AGN weighed 12.0-33.7kg (mean  $22.2 \pm 9.0$ kg) Fig.1. Dry weight among children with NS was 10-53.1 kg (mean  $26.0 \pm 12.7$ kg), among children with AGN, dry weight was 11.5-30.0 kg (mean  $19.3 \pm 8.2$ kg) Fig. 2. Weight loss among the children with NS ranged from 1.2-21.0 kg (mean  $5.5 \pm 4.3$ kg) giving percentage weight loss of 4.3-43.5% (mean  $18.1 \pm 9.8\%$ ). Weight loss among children with AGN was 0.5-5.2kg (mean  $3.0 \pm 2.0$ kg) with percentage weight loss of 4.2-26.4% (mean  $13.1 \pm 9.4\%$ ). In view of the 18.1% mean weight loss among the nephrotic children, a formula for dry weight estimation of  $(n-0.18n)$  was proposed where n is the oedematous weight at admission. Similarly, a formula  $(n-0.13n)$  was proposed for the dry weight in children with AGN since their mean percentage weight loss was 13.1%. With approximation to the nearest whole figure the formula is  $(n-0.2n)$  for Children with NS and  $(n-0.1n)$  for children with AGN (Table 2).

The duration of oedema in the children with NS ranged from 5-35 days with a mean (SD) of  $14.2 \pm 7.4$  days, while the duration in the children with AGN ranged from 8-21 days with a mean (SD) of  $12.8 \pm 5.7$  days.

The estimated weight for age of the study population was 12.0-50.0 kg with a mean of

30.1±12.3kg compared to dry weight range of 10.0-53.1 kg with a mean of 25.2±12.4kg (Fig. 3). The difference was not statistically significant. Furthermore, only 11 (33.3%) of the study population had their dry weight below 80% of estimated weight for age, while 32 (86.4%) had the dry weight below the estimated weight for age.

**Table 2:** Clinical characteristics of children with nephrotic syndrome and acute glomerulonephritis

Clinical characteristic	NS n=33	AGN n=4	P-value
Age (year)			
Range	2.0-15.0	3.0-13.0	
Mean (SD)	9.1±4.1	7.3±4.4	
Wt. at adm.(Kg)			
Range	12.9-68	12-33.7	
Mean(SD)	31.5±14.9	22.2±9.0	>0.05
Dry wt.(Kg)			
Range	10.0-53.1	11.5-30.0	
Mean(SD)	26.0±12.7	19.3±8.2	>0.05
Estimated Wt. for age(Kg)			
Range	12.0-50.0	14.0-43.0	
Mean (SD)	30.7±12.3	25.1±12.8	
% Estimated wt. for age			
Range	54.3-123.4	69.8-85.7	
Mean(SD)	84.4±16.6	79.6±6.9	
% Dry weight			
Range	81.0-184.0	121.0-143.0	
Mean(SD)	124.4±26.1	127.5±10.4	
Duration of oed. (days)			
Range	5.0-35.0	8.0-21.0	
Mean(SD)	14.2±7.4	12.8±5.7	
Wt. loss(Kg)			
Range	1.2-21	0.5-5.2	
Mean(SD)	5.5±4.3	3.0±2.0	
% Wt.loss			
Range	4.3-43.5	4.2-26.4	
Mean(SD)	18.1±9.8	13.1±9.4	

*%Dry weight =Estimated weight for age divided by the dry weight multiplied by 100*  
*%Estimated weight=Dry weight divided by the estimated weight for age multiplied by 100*  
*%Weight loss=Oedematous weight minus dry weight divided by the oedematous weight multiplied by 100.*

30.1±12.3kg compared to dry weight range of 10.0-53.1 kg with a mean of 25.2±12.4kg (Fig. 3). The

## DISCUSSION

Oedema in children with nephropathy contributes to false weight gain, making it difficult to determine the actual weight in such children. The mean oedema weight in our cohort of children was expectedly greater than the mean dry weight (30.5.vs 25.2 kg). The mean weight increase from oedema was as much as 5.5Kg in children with NS compared to 3.0kg in children with AGN. This indicated that oedema was a source of appreciable weight gain in children with NS. Most of this oedema fluid is extravasated fluid to the interstitium which is thought to result in decrease in intravascular volume[5]. Some workers have however found that intravascular volume may remain normal or occasionally reduced, irrespective of the magnitude of the oedema [6].

The mean oedema weight was greater in the children with NS than the children with AGN. This disparity may be accounted for by the differences in pathophysiology of oedema in both conditions. The oedema in NS was related more to reduced oncotic pressure as a result of profound hypoproteinaemia [ 5] unlike in AGN where the effect was as a result of reduced glomerular filtration rate from deranged renal function [7]. Similarly, the loss of weight was greater in the NS patients than the AGN patients (31.5 vs. 26.0 kg and 22.2 vs19.3kg) and percentage weight loss was 18% in NS compared to 13% in children with AGN.

The dry weight was less than the mean estimated weight for age in both conditions, with mean % estimated weight for age in all the patients of 83.9%. Furthermore, 86% of the patients had dry weight below the estimated weight, while 33% of the patients had their dry weight below 80% of estimated weight for age indicating that NS and AGN may interfere with growth or that the patients had background malnutrition and growth retardation before the onset of the illness. Unfortunately, the pre-morbid weights of these patients are not known, making it difficult to determine the effect of oedematous nephropathy on the pre-morbid weight

in these children. It should be noted that growth impairment due to urinary losses of growth stimulating hormone occurs in children with NS. They also have low plasma insulin like growth factor (IGF-1) and (IGF-II) which is associated with a urinary loss of the carrier proteins [8]. Urinary loss of growth stimulating hormone and the low IGF-I and IGF-II may have contributed to the nutritional status of patients with NS.

In view of the fact that oedema contributes significantly to the increase in weight in children with NS and AGN, there is need for a formula to predict or estimate the actual weight in such children. Therefore, in view of the 18.15% mean weight loss among the nephrotic children, a formula for dry weight of  $(n-0.18n)$  was proposed for children with NS where  $n$  is the oedematous weight at admission. Approximated to one decimal place, the formula is  $(n-0.2n)$  for NS. Similarly, in view of 13.1% mean weight loss in children with AGN, a formula  $(n-0.13n)$  was proposed for their dry weight. With approximation to the nearest one decimal place, the formula is  $(n-0.1n)$  for children with AGN. On the other hand, since the weight loss for all the 37 patients with oedema was 17.6%, the formula for dry weight of  $(n-0.17n)$  was proposed. Approximated to one decimal place, the formula is  $(n-0.2n)$  for children with oedematous nephropathy.

These formulae are recommended for the estimation of dry weight in children with oedematous nephropathy particularly those with NS and AGN. We are not unaware of the shortcomings/limitations of this study, such as the apparent small sample size

and lack of statistical significance of all the clinical indices. In spite of all these, we are still of the opinion that our findings will be a starting point in deriving a plausible formula for the determination of dry weight in children with oedematous nephropathy.

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## ***Sensorineural Hearing Loss in Chronic Kidney Disease – Outcome of Trial of Steroid Therapy***

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### **ABSTRACT**

The prevalence of sensorineural hearing loss (SHL) in chronic kidney disease (CKD) patient was between 10% - 67%. However, the outcome of treatment has not been well studied, especially in Nigeria. Our hypothesis is that steroid therapy may achieve improvement in hearing in these patients, hence we report the outcome following a trial of oral steroid. This was prospective study involving CKD patients with SHL. The subjects were commenced on oral prednisolone 60mg/day tailed over 4 weeks and this was repeated after 1 month and each patient had 3 courses. The pure tone average (PTA) was measured with a computer audiometer BA 20 Kamplex before and after treatment. The study population of 25 subjects involved 14 males and 11 females between the ages of 19 and 65 years, (46 ± 21.2). The PTA was between 65 - 100dB, mean = 70dB compared with post treatment hearing acuity of 50 – 95dB, mean = 65dB. Comparing the pre- and post- treatment PTA, an improvement of 5dB was seen in 2/25(8%), no change in 4/25(16%) while the PTA was increased by 10 – 30dB in 19/25(76%). Pearson correlation to compare the mean of pre- and post- treatment PTA revealed no significant difference (P =0.08). In conclusion, SHL in CKD patients was not responsive to steroid therapy; this is probably due to various persistent aetiological factors. However, this is an indication for further search for the effective treatment in order to improve quality of life in these patients.

**Keywords:** Sensorineural hearing loss; chronic kidney disease; steroid therapy; pure tone average.

### **INTRODUCTION**

Kidney – related ear dysfunction has been established, as the cochlea and retrocochlear region have been reported to be susceptible to the effect of uremia [7] but the pathogenesis is still being investigated. The reported prevalence of otologic symptoms in chronic kidney disease (CKD) was between 10% - 67% [1-3]. In addition, patients undergoing treatment with hemodialysis (HD) has also been found to manifest some degree of sensorineural hearing loss [4-6]. Several factors which are often present in these patients include ototoxicity, the advanced age and the possible accelerated presbycusis<sup>8</sup>. The multiplicity of aetiological factors make the treatment of the SHL difficult hence persistent. This probably accounted for the reason why the treatment of the hearing loss has not been emphasized in the literature. The purpose of this study is to report the hearing outcome in a trial of systemic steroid. Our hypothesis is that steroid therapy may achieve recovery of hearing function by suppressing the cochlear inflammatory response in these groups of patients.

### **MATERIALS AND METHOD**

Following report of sudden hearing loss in 2 patients on hemodialysis [3], 33 CKD patients were recruited

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for Pure Tone Audiometry (PTA) at admission and after three sessions of hemodialysis. The pure tone audiometry was done with a computer audiometer BA 20 Kamplex in the sound – proof (acoustic) booth in the ENT clinic. The hearing acuity was measured in db at the frequencies 500 – 8000Hz. The average for the four frequencies 500Hz, 1000Hz, 2000Hz and 4000Hz were recorded. A similar number of age and sex matched control were selected among volunteers who were otherwise clinically healthy and had pure tone audiometry done and recorded.

All patients with hearing loss, defined as pure tone average greater than 30dB, were commenced on prednisolone 60mg/day tailed over 4 weeks.. This course was repeated after 1 month interval and each patient had 3 dose regimes. Among these, 25 were followed up with PTA. The first audiometry was done immediately at the end of the first course of steroid, then at 3 – 6 month interval.

*Inclusion criteria:* Patients with chronic kidney disease, already under management by nephrologist, with complaints of hearing loss, or detected to have hearing loss on routine audiometry. *Exclusion criteria:* History of otitis media, unconscious patients and severe illness precluding patients from responding at audiometry.

The data was processed using the Statistical Package for the Social Sciences (SPSS Inc, Chicago, Illinois, USA). The mean hearing acuity of pre- and post – steroid treatment were determined and paired student t – test was used to find the significance of the difference. Pearson correlation coefficient was used to find the correlation between PTA and other variables such as duration of illness, blood pressure, serum creatinine, dosage of diuretics and age.

## RESULT

A total of 25 patients were treated and followed up for 1 – 3 years. They are made up of 14 males and 11 females between the ages of 19 – 65 years, mean 46(SD = 21.2). There was an improvement of 5dB between pre- and post- treatment PTA in 2/25(8%) patients, the values were the same in 4/25(16%) while the PTA was increased by 10 – 30dB in 19/25(76%). The pretreatment pure tone average (PTA) was between 65 - 100dB, mean = 70dB compared with post treatment hearing acuity of 50 – 95dB, mean = 65dB.

Pearson correlation to compare the mean of pre- and post– treatment hearing acuity revealed no significant difference (P =0.08).

## DISCUSSION

The major finding from this study revealed that there was no significant difference in the mean pure tone average pre- and post – treatment of the hearing loss with systemic steroid. This is an indication that the hearing loss in chronic renal failure was not responsive to steroid therapy. Most reports are in support of persistence and/or deterioration of hearing loss during and after hemodialysis. Simone *et al* [9] also reported further deterioration of hearing function in CKD after 1 year of follow-up. They found high frequency hearing loss in 37 patients with chronic renal failure undergoing conservative medical treatment [9]. Gatland *et al* [10] reported increased hearing threshold after hemodialysis in 22/31 ears with pre-existing low frequency loss with little change in other frequencies and no correlation with weight changes. They suggested treatment induced changes in fluid and electrolyte composition of endolymph as possible mechanisms [10]. Mancini *et al* found SNHL in 29% of patients on conservative treatment, 28% of patients on hemodialysis, and 47% after renal transplantation. They also found significant correlation with the administration of ototoxic drugs thus hypothesized that SNHL may be reduced in patients with CKD or on renal replacement therapy by strictly monitoring ototoxic therapy [11]. The choice of steroid is based on the thinking that steroid could reduce the cochlear inflammatory response to uraemia and other toxic products of metabolism in renal failure, however the persistence of the hearing loss after steroid therapy appeared not to have substantiated this impression. It may also be due to the multiplicity of factors responsible for hearing loss in these patients. Continued use of diuretics and antihypertensives resulting in cochleotoxicity is one major factor in these patients. The other factors include ototoxins, axonal uremic neuropathy, anemia, and toxic degradation products from cellulose acetate dialyzer membranes [1-7]. In addition there are various inherited conditions in which renal diseases are associated with sensorineural deafness and the hearing loss in these conditions are persistent. These include alports, refsum disease, Charcot-Marie-Tooth, ataxia hyperuricaemia, ichthyosis, branchio- oto-renal (BOR) syndrome etc. There is a chance that this may be missed in these patients and the underlying genetic defect may be responsible for the persistence of the deafness [12]. In BOR and renal tubular acidosis, genetic mutation on the EYA1 gene on

chromosome 8q13.3 and mutations in ATP6V1B1 and ATP6V0A4 expression within the *cochlea* has been reported [13-15].

All these factors are conditions that can persist chronically in the uraemic state leading to irreversibility of the hearing loss once it develops.

We conclude that the observed sensorineural hearing loss in chronic renal failure patients was not responsive to steroid therapy; this is probably due to various persistent aetiological factors in these patients. However, this report further emphasizes the continued search for the treatment of sensorineural hearing loss in chronic kidney disease; otherwise it still appears an irreversible process.

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