SA Renal Congress 2018: Oral Presentations

**Please note that the abstracts have been detailed as received.*

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SARS and PAEDS Oral Presentations

007

Genetic associations with onset and progression of focal segmental glomerulosclerosis (FSGS) in black South African children

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In children who present clinically with nephrotic syndrome, the most common type of primary glomerular disease causing end stage renal disease (ESRD) is FSGS. There is evidence of a more rapid progression of FSGS to ESRD in black patients compared to other ethnic groups and no studies have been performed in black South African children. The aim of this study was to determine genetic associations with apolipoprotein L1 (A*POL1*) risk variants and podocin (*NPHS2*) variants in black children with FSGS.

Thirty-two unrelated black South African children with biopsy proven FSGS were recruited from two clinics in Johannesburg. Three *APOL1* risk variants were genotyped and the exons of the *NPHS2* gene sequenced in the cases and healthy ethnically matched controls. Genetic association analysis with *APOL1* risk variants and *NPHS2* variants were performed in a case: control analysis. *APOL1* genotypes and haplotypes and *NPHS2* variants were correlated with kidney function and response to steroid treatment in all FSGS cases. Two families were examined for allele segregation with FSGS

There was no association of *APOL1* risk variants and haplotypes with FSGS. Steroid resistant nephrotic syndrome (SRNS) and steroid sensitive nephrotic syndrome (SSNS) was present in 22 (69%) and 10 (31%) of the cases respectively. *NPHS2* variant V260E (associated with SRNS) was present in the homozygous form in 13/22 and the heterozygous form in 4/22 of SRNS cases and was not present in any of the SSNS cases.

The *NPHS2* V260E variant is strongly associated with SRNS. Genotyping the V260E variant in black children with FSGS could potentially be used in a clinical setting to guide effective steroid treatment and prevent serious adverse events.

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036

Use of 'Home-Made Pd' adapted intravenous fluid solution for acute peritoneal dialysis in Africa

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Peritoneal Dialysis (PD) in paediatric Acute Kidney Injury (AKI) is usually dependent on commercially manufactured peritoneal dialysis fluid and surgically inserted PD catheters. These fluids are not available in many African countries. In addition, there is also a shortage of trained surgeons to place PD catheters. The objective of this study was to determine the safety and effectiveness of hospital made peritoneal dialysis fluid to treat children with AKI.

Retrospective database review of paediatric AKI cases in which acute PD was used at Red Cross Children's Hospital from 1999 – 2014. A subgroup analysis was done on cases in which a hospital made bicarbonate solution was used to treat cases of severe acidosis. This fluid was made at the bedside by the treating physician by adding 50% Dextrose to an intravenous solution (Balsol).

611 cases were reviewed. 49 cases were treated with hospital made PD fluid. Age: mean 1.13 yrs (range 1day-10.2yrs). This included 17 Neonates and 40 infants. Weight: median 4.1 kg (range 1.3-50kg). Time on PD: mean 3.9 (range 1-17 days). Manual PD was performed 37/49 cases. 47 catheters percutaneously placed at the bedside by the treating physician. PD complications: bladder insertion of catheter in one case, this was removed with no side effects; blockage of catheter needing 're-wiring 'in five cases; peritonitis in 2 patients although only one was attributed to the peritoneal dialysis; no bleeding and no electrolyte abnormalities were noted. Patient survival was 43%.

Hospital made PD fluid using an intravenous solution proved to be safe and effective.
This has important relevance for centers in less well-resourced countries across the world where commercially produced PD fluid is not available for management of AKI.

040

The complications of peritoneal dialysis in children with end-stage renal disease in Johannesburg, South Africa: A 5-year experience

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Introduction / Background
Children with end-stage renal disease are commonly placed onto chronic peritoneal dialysis (PD) while awaiting transplant. Mechanical, infectious and metabolic complications of PD may lead to technique

failure, morbidity or mortality. This study aims to describe the mechanical and infectious complications and associated risk factors in children on chronic PD.

Methods
A retrospective record review of patients less than 18 years old enrolled on the chronic PD program of Charlotte Maxeke Johannesburg Academic and Chris Hani Baragwanath Academic Hospitals between 1 January 2009 and 31 December 2013.

Results
Thirty-five patients had complete records which were suitable for analysis. Seventy one percent of the patients had one or more complications while on PD. The most common complication was peritonitis (54%) followed by catheter obstruction (29%). Patients on automated peritoneal dialysis (APD) were significantly less likely to develop peritonitis than those on continuous ambulatory PD (Odds Ratio [OR] 23.14, 95% CI 2.45 – 218.0, p = 0.002). Patient age was found to be significantly associated with dialysate leak, with the younger patients having an increased risk of developing a leak. (OR 19.5, 95% Confidence Interval [CI] 1.29-292.8, p = 0.003). No statistically significant associations were found between patient sex, early use of the peritoneal dialysis catheter, starting serum albumin or BMI and any of the complications.

Conclusions
Children on APD are significantly less likely to have peritonitis. This benefit is likely to translate into reduced hospital admissions, cost savings, less technique failure and better patient quality of life. We recommend that patients be preferentially placed on APD.

021
The state of kidney transplantation in South Africa

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Introduction / Background
Kidney transplantation has been performed in South Africa since 1966. Transplants were initially limited to state hospitals and the entry of the private sector heralded a new era in organ transplantation. We undertook to document kidney transplantation in South Africa over 25 years and to compare numbers, rates, trends and sources of kidneys transplanted in public and private sectors in South Africa.

Methods
The Organ Donor Foundation national kidney transplant data collected between 1991 and 2015 were analysed. The total number of kidneys transplanted in the country were counted and rates calculated. The numbers and rates of kidney transplants in the private and public sectors were compared. The source of donor kidneys and sites where transplants were performed were documented.

Results
Over the 25-year period under review 7 191 kidney transplants were performed in South Africa. The overall kidney transplant rate was 6.4 per million population (pmp), averaging 4.8 pmp in the public sector and 15.2 pmp in the private sector. 58.3% of donor kidneys transplanted in South Africa were derived from deceased donors. Cape Town and Johannesburg perform 75% of the country's kidney transplants.

Conclusions
There was a steady and alarming decline in the rate of kidney transplantation in South Africa over the 25-year period with the public sector more effected. Most transplants in the country were performed in the

public sector and deceased donor kidney transplants predominated. Discrepancies existedin the allocation of kidneys; rural areas in particular were underserved. Urgent steps are required if the current situation with regard to the rate and distribution of kidney transplants is to be improved.

022

Did improving procedural fairness in the allocation of dialysis access by application of 'accountability for reasonableness' in the Western Cape have the desired outcome?

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Introduction / Background

We implemented a priority setting protocol for end stage kidney diseases (ESKD) patients; we developed the protocol using the 'Accountability for reasonableness' ethical framework (A4R) based on the primary premise that patients accepted for dialysis had to be suitable for kidney transplantation. South Africa is a middle-income country facing immense sociocultural challenges. Both communicable and non-communicable diseases take a heavy toll on human lives. Chronic kidney disease is increasing and the demand for dialysis and kidney transplantation has reached unprecedented levels. The public-sector health system is unable to meet the growing need; rationing of renal replacement treatment for patients with ESKD has been implemented since the initiation of dialysis in the country. Initial informal allocation strategies resulted in unfair selection favouring whites, the employed and married. The priority setting process (A4R) culminated in promulgation of a formal policy which was applied in the Western Cape; it involved stakeholders including staff, lawyers, patients, ethicists in an iterative process.

Methods

We analysed outcomes of the application of A4R at two teaching hospitals in Cape Town.

Results

Over 7 years, 25% of 1101 ESKD patients assessed were accepted for dialysis at Tygerberg Hospital. Patients accepted were younger, employed, married and not diabetic. At Groote Schuur Hospital over 5 years 48% of 564 patients were accepted with similar predictors of acceptance. Availability of resources probably accounted for differences in acceptance rates between the 2 hospitals. Psychosocial factors (e.g. poverty, substance abuse) remained the main reasons patient were treated conservatively.

Conclusions

The majority of ESKD patients in the Western Cape were treated conservatively; psychosocial factors continued to play key roles in selection of patients needing dialysis. However, the A4R based policy result was fair, transparent and defensible ethically, morally and legally. To solve social issues and achieve equitable access to the limited dialysis facilities in South Africa physicians need to advocate beyond health.

001

Anaemia, mean corpuscular volume and mortality among a black CKD population in South Africa

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Introduction / Background
The burden of chronic kidney disease is increasing globally and prompt identification; coupled with improved management of CKD patients have increased the population of pre-dialysis patients. However, CKD patients in less resourced countries may not have optimal care and the current survival pattern of pre-dialysis CKD patients is not well characterised. We, therefore, aimed to evaluate the predictors of survival among black pre-dialysis CKD patients in Johannesburg.

Methods
We conducted a cohort study of 256 consecutive consenting Black non-dialysis requiring CKD patients attending the renal outpatient clinic of Charlotte Maxeke Academic Hospital from 1st June 2016 to 1st December 2016 and were followed up till 31 December 2017. Socio-demographic and clinical information of the participants were obtained using self-administered questionnaire, and participants were followed up at clinic visits every one to three months or by telephone. Descriptive statistics, Kaplan-Meier curves and Cox proportional hazard regression analyses were conducted to evaluate factors affecting the survival of the participants.

Results
The mean age of the participants was 52.8±14.3 years and 49.5% were females, and 51.9% were males. During a median follow up of 18 months, the mortality rate was 1.12 per 100 person- years. The death rate increased with worsening haemoglobin level from 0.96 among patients with mild anaemia to 4.29 per 100-person years among patients with severe anaemia. Anaemic patients with GFR < 30mls/min had significantly increased risk of death (HR 11.51, 95% CI 1.62–78.32, P < 0.001). Participants with hyperphosphatemia had about 2.6-fold increased hazard of death (HR, 2.60; 95%CI, 1.09-6.20, P =0.02).

Conclusions
Mortality in pre-dialysis CKD patients was associated with anaemia and hyperphosphatemia. Clinical interventions targeted at preventing these conditions may improve outcomes among this group of CKD patients.

005

An audit of treatment of AKI in SADC and Nigeria: are we ready for zero deaths by 2025 in sub-Saharan Africa?

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Introduction / Background
Acute kidney disease (AKI) is estimated to be responsible for 1.7 million deaths annually with an excess coming from the developing world due to inadequate access to care. The International Society of Nephrology has called for zero deaths by 2025. This survey aimed to determine the preparedness of Southern African Development Community (SADC) countries and Nigeria to heed this call.

Methods
Facilities where renal replacement therapy was available were identified. A questionnaire was created to determine type of services available, quality of care and to identify the clinicians involved in the care of AKI. The questionnaire was emailed to hospitals and clinicians.

Results
Completed questionnaires were received from 12 out of the 15 SADC countries and Nigeria, covering 48 service providers. Hospitals were either tertiary or university in 89.6% of cases. The government provided funding for dialysis in 41.7% of services. Out of the 16 countries that were included in the survey, 14 provided government funding for dialysis. Interdisciplinary teams in 72.9% of hospitals covered the

intensive care units (ICU), which included at least 1 nephrologist in 75%. However, only 77% of hospitals were able to provide dialysis in an ICU. Intermittent haemodialysis was the most common modality available in 91.7% of facilities, SLED in 50%, continuous therapies in only 35% and peritoneal dialysis in 33.3%. Almost half the sites were limited to one mode of dialysis and unable to care for severely ill patients. The clinical status was used to initiate and monitor dialysis, with very few sites having clear written indications for dialysis or standard operating procedures.

Conclusions
In the sixteen countries surveyed assessed the majority had very limited ability to provide comprehensive dialysis programme for patients with AKI due to lack of facilities and government funding. Additionally, there is a scarcity of nephrologists, limitation in the modes of dialysis, limitation in the care for the most severely ill patients and lack of standard operating procedures. Resources, training and funding need to be made available to create universal coverage of dialysis for AKI.

006

Using a novel urinary biomarker (MCP-1) to assess disease activity in patient with lupus nephritis – Interim results from a single centre in Cape Town

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Introduction / Background
Lupus nephritis (LN) is a common cause of chronic kidney disease and end-stage renal disease requiring dialysis in South Africa. A non-invasive, easy to obtain and accurate biomarker that can discriminate disease activity and severity, predict flares, and monitor treatment response and disease progression would be very useful in guiding patient management. Within the kidney, locally secreted chemokines such as monocyte chemoattractant protein-1 (MCP-1) are instrumental in the pathogenesis of LN and may therefore have the potential to accurately reflect renal inflammatory disease activity in LN. This study aimed to assess the correlation between urinary MCP-1 concentrations and disease activity in patients with lupus nephritis.

Methods
A cohort of fifty patients was recruited from the Nephrology Clinic at Groote Schuur Hospital. This consisted of (i) a clinically stable group with quiescent LN (n=30) and (ii) an active disease group (n=20) made up of newly biopsied LN. Relevant demographic and biochemical data was collected from each group. Urinary MCP-1 was measured by Enzyme-linked Immunosorbent Assay (Quantikine ELISA , R&D Systems USA). Statistical analysis was performed for non-parametrical data using Wilcoxon rank-sum test (Stata14, StataCorp LLC). A p value <0.05 was deemed statistically significant.

Results
Demographic features (age, gender and race) were similar in both groups. Serum creatinine was not significantly different between the groups ($p=0.093$), however, disease activity index (SLEDAI score) was significantly higher in the active group ($p<0.0001$). Patients with active LN demonstrated a significantly higher urinary MCP-1 concentration than patients in the quiescent group [data described as median (P25; P75): 1440 (683; 2729) vs 256 (175;477) pg/mL; $p<0.0001$]. When the patients' MCP-1 concentrations were corrected for their urinary creatinine concentrations (in pg per mg of creatinine), the active group

demonstrated values that were again significantly higher than the quiescent group [1093 (577; 1848) vs 286 (138; 774) pg/mgCr; p<0.0001].

Conclusions
As per previous studies in other countries, this interim analysis of our data suggests that urinary MCP-1 reflects renal disease activity in our South African cohort of LN patients and could be useful for diagnosis and disease activity monitoring .

019

The influence of dialysis modality on post-transplant outcomes

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Introduction / Background
Renal transplantation is the therapy of choice for end stage kidney disease, offering mortality risk reduction and improved morbidity over dialytic therapies. Limited data is available evaluating the effect of pre-engraftment dialysis modality on transplant outcomes.

Methods
A retrospective review was conducted on all adult patients undergoing renal transplantation at Charlotte Maxeke Johannesburg Academic Hospital for the period 01/01/2006 – 31/12/2011 (n=103). Transplant outcomes were assessed by dialysis modality. □□testing was used to compare dialysis modalities; Cox proportional hazard modelling was used to assess effect on graft outcomes. A $p < 0.05$ was deemed statistically significant.

Results
Antecedent dialytic modality was as follows: 55 patients (53.4%) received hemodialysis (HD), 35 (34%) received peritoneal dialysis (PD), and 13 (12.6%) received a combination of both (HD+PD, defined as either modality for > 3 months). Acute rejection (AR) was documented in 43.7% of patients; 54.3% of PD patients developed AR compared to 38.2% of HD patients and 38.5% of HD+PD patients (p=0,29). No significant difference in the number of episodes of AR was detected between modality groups (p=0.44). Chronic rejection (CR) developed in 22.3% of patients overall; 21.8% of HD patients, 25.8% of PD and 15.9% of HD+PD patients (p=0,74). PD was associated with an increased risk of developing any rejection (HR=2,4, 95% CI 0,9–6,4, p=0,02). Whereas dialysis modality did not affect graft survival (for HD □□= 0.57, SE=0.5, Wald=1.2, 95% CI -0.4-1.6, p=0.27; for PD □=0.58, SE=0.5, Wald = 1.4, 95% CI -0.4-1.6, p=0.24). AR was associated with future graft loss (□=1.29, SE=0.3, Wald = 18.1, 95% CI 0.7-1.9, p<0.001).

Conclusions
Antecedent PD is associated with an increased risk of graft rejection. Although AR is associated with graft loss, antecedent dialysis modality does not directly predict graft survival, likely reflecting the multifactorial nature of cumulative allograft injury.

031

Plasma fibroblast growth factor 23 and all- cause mortality in South African patients on maintenance haemodialysis

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Background
Few studies have linked high levels of plasma C-terminal fibroblast growth factor 23 (FGF23) with poor clinical outcomes in patients on maintenance haemodialysis (MHD), while the association between intact FGF 23 and mortality in this group of patients remains inconclusive.
Therefore, the aim of this study was to evaluate the association between plasma levels of intact FGF 23 and mortality in MHD patients.

Methods
A 3 year prospective multicentre study involving patients undergoing MHD at three dialysis centres in Johannesburg was undertaken between the periods of October 2014 and December 2017.
The association between the quartiles of FGF-23 and mortality was assessed using the Cox proportional hazard model.

Results
The study comprised 165 MHD patients (111 blacks, 54 whites) with a mean age of 46.5 ±14.2 years. During a three year follow up period, there were 40 deaths (0.9 per 100 person- years). The median plasma FGF 23 was 382 pg/ml (interquartile range [IQR], 148-2977). In adjusted multivariable analyses, there was a non-statistically significant increase in the risk of mortality with higher quartiles of FGF 23 levels : the adjusted hazard ratios(HR) for the second, third and fourth quartiles were HR 1.85 (95% CI, 0.66-5.22; P=0.24), HR 1.55 (95% CI, 0.55-4.36; P=0.40), and 1.65 (95% CI, 0.55-4.97; P= 0.37) respectively. As compared with normal levels (2.11-2.37 mmol/l), serum calcium levels > 2.38 mmol were independently associated with increased risk of all-cause mortality HR 2.40 (95% CI, 1.13-5.09; P=0.023).

Conclusion
Higher levels of intact FGF 23 appear not to be independently associated with all cause mortality in MHD patients, while hypercalcaemia was found to be an independent predictor of mortality in this cohort of patients.
However, larger studies are further needed to confirm the non significant association between the intact FGF 23 and all cause mortality in MHD patients.

057

Sensitivity and specificity of anti-phospholipase A_2 receptor ($APLA_2R$) A and thrombospondin type-1 domain-containing 7a (THSD7A) in identifying idiopathic membranous nephropathy in a South African cohort

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Introduction / Background
Idiopathic membranous nephropathy (IMN) is a common cause of nephrotic syndrome in adults accounting for up to 18.5% of primary glomerulonephritides in South Africa. Anti-phospholipase A_2 receptor ($APLA_2R$) antibodies have been described to be useful for identifying IMN. In this study, we describe the utility of $APLA_2R$ and thrombospondin type-1 domain-containing 7A (THSD7A) in identifying IMN in a single centre.

Methods
In a 10-year period (2007 to 2016), we assessed biopsies identified as IMN and stained their slides for $APLA_2R$ and THSD7A using standard methods as described by manufacturers. We also stained, with the

same antibodies, the biopsies of patients with lupus membranous nephropathy (LN-V) and diabetic nephropathy (DN) for the same study period as controls. All the biopsies were analyzed and reviewed by a single pathologist (B.F.).

Results
There were a total of 88 biopsies assessed (46.6% IMN; 21.6% LN-V and 31.8% DN). Overall, there were 31.8% males, black Africans were 33.0% and mean age was 42.9 ± 16.4 years. Overall, 64.8% had nephrotic range proteinuria (85% - IMN; 74.5% - LN-V and 56.5% - DN; p = 0.045). The sensitivity of $APLA_2R$ for identifying each disease condition was 51.2% vs 0% vs 0% for IMN, LN-V and DN, respectively ($p<0.0001$). The specificity of $APLA_2R$ was also highly significantly different for IMN than LN- V and DN ($p<0001$). However, the sensitivity of THSD7A for IMN, LN-V and DN was 4.9% vs 0% vs 0% respectively ($p=0.309$).

Conclusions
To the best of our knowledge, this is the first African study assessing the roles of biomarkers in identifying IMN and our data has shown that $APLA_2R$ is a more sensitive test than THSD7A for identifying IMN in histological tissues of renal biopsy patients. Further studies are needed to corroborate our findings.

RCSSA Oral Presentations

009

Comparative analysis of urea reduction ratios (Urr) of chronic renal failure patients on nocturnal and diurnal haemodialysis treatment

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Background
Dialysis machine technology has advanced significantly enabling us to receive better understanding of clearance, by having a greater capacity for increased blood and dialysate flow rates as well as greater membrane porosity and biocompatibility. These advancements allow for better measurement of dialysis adequacy and improved clearance. Private units in SA and USA provide mostly 4 hour dialysis. The concern with 4-hour dialysis is whether it provides optimum removal of toxins and solutes. Nocturnal chronic haemodialysis (NCHD) consist of at least 8 hour dialysis. Longer dialysis provides a better option for enhanced clearance.

Methods
This is a prospective and quantitative study consisting of 30 patients on CHD, nocturnal 8-hour dialysis and 4-hour, 3 x week diurnal dialysis. The patients were recruited from National Renal Care (KZN and Gauteng) and were monitored over a course of 3 months. Measurement of adequacy were measured using URR

Results
Nocturnal haemodialysis resulted in better urea clearance. The values are strongly significant $P < 0.0001$ with a high correlation coefficient t r= 0.5009. The urea reduction ratio in the nocturnal CHD group was significantly higher than the diurnal CHD group. The difference between the percentage change of URR from each modality were significant $p <0.05$.

Conclusion
Longer nocturnal dialysis provides better clearance. It is observed that the URR in the nocturnal group was significantly higher than the diurnal group.

010

Implementing strategic change in a selected private healthcare company in South Africa: The importance of leadership and change readiness

Edmund Jacobs

National Renal Care

Today's organisations find themselves in a complex and changing world, characterised by great uncertainty, volatility and risk. In order for organisations to survive and remain competitive in today's business environment, organisations must continuously look at different and more efficient ways of doing business, and in extreme situations re-engineer the whole organisation. The implementation of organisational change seems to remain challenging to most organisations, especially as the stakeholders of the organisation have different expectations and experiences of the change.

A clearer understanding of the organisational and personal factors that influence the implementation of change within the organisation is required in order to improve the success rate of the implementation of organisational change. The research sought to investigate employees' perceptions and experience of organisational change via a descriptive quantitative research study. Data was collected via e-questionnaire.

The main research findings showed that there are both organisational and personal characteristics present, which could potentially lead to the ineffective implementation of organisational change and employee resistance to change. Organisational issues identified in the research included allocation of organisational resources, employee participation, communication and change leadership. Personal issues identified included fear of loss of status, job insecurity, impact on self-interests and habits.

The report concludes with practical recommendations for improving the way change is managed within the organisation. These initiatives are intended to modify the way change is managed within the organisation by improving resource allocation, participation, communication and leadership change management skills and knowledge. These initiatives will also seek to reduce employee resistance to change. Organisations that implement organisational change initiatives are advised to carefully consider employee resistance to change, and change programmes should be designed in such a way so as to deal with the uncertainties and insecurities that tend to result from organisational change.

013

Assessing the effectiveness of management tools in healthcare: A case study of the quadruple aim model at a private dialysis company in South Africa

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Introduction
Healthcare systems are being challenged to reform by rising costs and disparities in quality. South African healthcare is unable to support RRT for everyone with only a select few making it on dialysis. In an era of significant change, effective management is essential for sustainability. The study aimed to assess the Quadruple aim model as a management tool in the dialysis supply area in South Africa.

Methods
A descriptive correlational research study carried out on 1197 HD patients and 60 healthcare professionals in 20 privately run dialysis units, evaluating the quadruple aim: 1) patient satisfaction; 2) clinical outcome; 3) cost and 4) provider experience.

Results

The research study provided a holistic understanding of how the organizational context influences the operational effectiveness of a dialysis facility and ability to optimize its resources and strategies. The study revealed economies of scales are achieved in a larger dialysis unit, however an inverse correlation was seen between profit before interest and tax (PBIT) and patient satisfaction. The top box patient satisfaction score for a dialysis unit, and dialysis staff were higher in comparison to the nephrologist score. A higher patient satisfaction score was seen in smaller dialysis units. The study exposed a high extent of burnout in nephrology professionals, particularly in a larger dialysis unit. The overall dialysis unit safety grade was high although shortages of healthcare professionals was highlighted. The study has indicated that the Quadruple aim model has the potential to guide the redesign of healthcare systems in the chronic hemodialysis delivery business and provide a template to the transition to quality care.

Conclusion

The Quadruple aim model has been shown to be a relevant and a valuable framework which can be used to address the challenges facing the supply of dialysis in South Africa. This evaluation could prove to be invaluable with ongoing regular successful implementation.

Sunday 14 October 2018

SARS Oral Abstracts

023

CYP3A5 polymorphisms and their effect on tacrolimus exposure in an ethnically diverse South African renal transplant population

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Introduction / Background
Tacrolimus forms the cornerstone for immunosuppression in solid organ transplantation. It has a narrow therapeutic window with wide inter and intra-patient variability. CYP3A5 is the predominant enzyme for tacrolimus metabolism. The rs776746A>G is the most frequently studied polymorphism in CYP3A5. The rs776746A>G (i.e. CYP3A5*3) single nucleotide polymorphism (SNP) in CYP3A5 alters tacrolimus concentration (C_o) levels, which may lead to immune and/or drug mediated allograft injury.CYP3A5*3 may result in absent (*3/*3), partial (*1/*3) or normal (*1/*1) expression of CYP3A5. The effect of CYP3A5*3 on tacrolimus exposure has not been studied in South African transplant recipients.

Methods
All consenting stable renal transplant recipients on tacrolimus at Livingstone Hospital Renal Unit were included. Tacrolimus concentrations were obtained using a micro particle enzyme immunoassay method (ARCHITECT analyser). PCR/RFLP was used to genotype for CYP3A5.

Results
There were 43 participants (35% Black, 21%White and 44% Mixed Ancestry ethnicity) with a mean age of 44.5 (SD 12.3) years, median duration post-transplant of47 (IQR 24-110) months and median creatinine and eGFR was 114umol/L (IQR 92-140) and 61ml/min (IQR 49-76) at study inclusion. Overall, 37% were CYP3A5 expressors (*1/*1), while 28% were partial expressors (*1/*3) and 26% were non-expressors (*3/*3). CYP3A5*1/*1 and CYP3A5*1/*3 genotype carriers required a two fold increase in dose compared to non-expresser genotype carriers, CYP3A5*3/*3 ($P<0.05$). The distribution of CYP3A5 expressors (i.e. *CYP3A5*1/*1+*1/*3*) was 100%, 75% and 12.5% among Black, Mixed Ancestry and Caucasian participants, respectively. The mean tacrolimus C_0 in the study was 7.2ng/ml with no difference across race groups. However, the mean total daily dose of tacrolimus required was 9.1 (0.12mg/kg), 7.2 (0.09mg/kg) and 4.3 (0.06mg/kg) milligrams daily in Black, Mixed Ancestry and White ethnicity, respectively.

Conclusions
CYP3A5 genetic variation affects tacrolimus dose requirements. Knowing CYP3A5 genotypes of transplant recipients may allow better dose prediction compared to current standard dosing recommendations.

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050

The role of *APOL1* and *ITGAM* in systemic lupus erythematosus and lupus nephritis

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Introduction / Background

Systemic Lupus Erythematosus (SLE) is a chronic autoimmune disorder, characterised by an overactive immune system, with loss of self-tolerance core to the pathophysiology Clinical manifestations are protean, and range from relatively minor complaints such as isolated arthralgia, to life threatening complications such as end stage renal disease (ESRD) and complex neurological disorders. Risk factors for the development of SLE and Lupus Nephritis (LN) include both environmental and genetic factors. The nonsynonymous functional variant rs1143679 A in the integrin-αM (ITGAM) gene is strongly associated with the development of the SLE phenotype in both European and American populations, but its effect in African SLE patients is unknown. In contrast, the G1 and G2 alleles of Apolipoprotein L-I (APOL1) have been shown to be risk factors for renal disease in hypertension, HIV and SLE in patients of African origin, but not of European origin.

Methods

ITGAM and *APOL1* were genotyped in SLE patients (N = 131 and 170 respectively) and controls (N = 155 and 176). Odds ratios were calculated and evaluated for significance using the χ^2 statistic for discrete values, while continuous data was analyzed with the AONVA statistic.

Conclusions

Our analysis revealed that the *ITGAM* risk allele is associated with the development of SLE, but not LN. However, the *ITGAM* risk allele was found to be associated with hyperfiltration and proteinuria, suggesting underlying undiagnosed LN. Our analysis of the *APOL1* risk alleles confirmed the association with renal disease in SLE. In addition, a second functional variant was found in close proximity to the G1 and G2 alleles.

058

Clinical utility of urinary transforming growth factor beta (TGF-β) in the diagnosis of Chronic Kidney Disease (CKD) in the HIV population

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Introduction / Background

The early diagnosis and management of CKD in the HIV population may aid in the reduction of adverse health consequences including kidney failure and cardiovascular disease. This would require a clear understanding of the pathobiology of kidney disease in HIV population. Upregulation of TGF-beta-1 activity is linked to the pathogenesis of diabetic nephropathy and some forms glomerulonephritides, and is well established as a potent facilitator of renal fibrosis. The utility of TGF-beta-1 as a biomarker in HIV-related CKD remains unclear.

Methods
One hundred and seventy-eight HIV-infected patients without CKD and 130 HIV-infected patients at various stages of CKD had their serum creatinine, urinary protein-creatinine ratio, serum TGF-beta-1 and urinary TGF-beta-1 measured after collection of important sociodemographic variables. TGF-beta-1 was measured using ELISA techniques. Urinary TGF-beta-creatinine ratios (uTGFCr) were calculated. Individuals with hypertension or diabetes mellitus were excluded from the study. Comparison of uTGFCr levels was performed using the Mann-Whitney U-test. Spearman Rank correlation was employed to assess the linear relationship between uTGFCr and other continuous variables. Multivariable linear regression model was used to assess independent association with changes in uTGFCr levels. Receiver Operator Characteristic (ROC) analysis was used to assess the utility of uTGFCr in the diagnosis of CKD in the HIV population.

Results
The mean age of the participants was 38.3±10.3 years with 73.4% being female. The median uTGFCr was significantly higher among HIV patients with CKD compared to those without [4.85 (IQR 1.96-12.35) versus 2.95 (IQR 1.02-5.84); p=0.001). There was no significant correlation between uTGFCr and age, mean arterial blood pressure, waist circumference and body mass index. Among the patients with CKD, there was gradual reduction in the median level of uTGFCr as CKD stage became more severe. HIV-infected individuals with CKD had significantly higher levels of uTGFCr after controlling for changes in age, gender, BMI, blood pressure levels, waist circumference and CKD stage. The area under the ROC curve was 0.63.

Conclusions
HIV patients with CKD express higher levels of TGF-beta-1 activity in urine especially in the early stages of CKD and therefore may be useful as an early indicator of CKD occurrence among HIV patients.

RCSSA Oral Abstracts

012

Chronic dialysis therapy yields a significant infectious burden – A call for national surveillance

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Background
Patients receiving chronic dialysis therapy are vulnerable to infection because of regular contact with hospital environments, indwelling catheters for dialysis access and comorbid conditions e.g. diabetes.

Methods
A retrospective review of laboratory confirmed infections in patients receiving chronic peritoneal or hemodialysis care from June 2015 to May 2016. Comparisons were made between gram-positive, gram-negative bacteria and fungal organisms and their antimicrobial sensitivity profiles as well as between PD and HD patients

Results
Overall, 238 infections were reported, corresponding to an infection rate of 9.1/100 dialysis patient years (95% CI: 8.1-10.4). The overall infection rate for PD was 31.3/100 dialysis patient years (95% CI 24.6-40.) and this was significantly higher than that for CHD (7.2/100 dialysis patient years (95% CI 6.2-8.3))

(p<0.0001). 51 blood stream infections were reported in the HD group and 41 cases of peritonitis in the PD group.

Patients who developed infections, one third had been admitted to hospital in the last 90 days, 34% had diabetes and 66% were male. The average length of stay was 7 days and there was a 5 % (12) mortality. Forty-nine percent of the patients had gram-positive infections, 44.4% had Gram-negative infections. 2 patients had yeast/fungal infections on peritoneal fluid. The most common group of gram negative organisms was the Enterobacteriaceae (77.7%) and the most common gram positive pathogen was staphylococcus aureus (41.2%).
Multidrug resistance was high with Enterobacteriaceae showing 55% were beta-lactamase and 24% were Carbapenemase producers. Forty-nine percent of staph aureus were methicillin resistant and 70% of coagulase negative staph were methicillin resistant.

Conclusion
This study is the first published data from SA on the microbiological profile of infections in a population of chronic dialysis patients. Results show that patients present with approximately equal proportions of gram positive and negative organisms and a significant amount (50%) of organisms exhibit antimicrobial resistance.

011

Tackling the drought in the Western Cape Province in South Africa – Strategies to alleviate the impact on dialysis patients

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National Renal Care

South Africa is a water scarce country. In the Western Cape (WC) rainfall decreased significantly causing dam levels to drop from 66% in 2015 to 25 % in 2018 (-41%). As a result, Cape Town has been severely impacted upon which has in turn had an effect on delivering dialysis. As dialysis is a life sustaining therapy, a WC Contingency Dialysis Plan (WCCDP) was developed in preparation for 'Day Zero'.

The WCCDP has three parts based the anticipated length of the outage and includes four key concepts:

1. **Knowing the numbers:** includes knowing the water usage per dialysis unit i.e. water consumption, RO capacities, current water storage capacity, conservation dialysis and transportation of water.
2. **Operational contingency** played a fundamental role throughout the development of the contingency dialysis plan. Disaster units that were identified were based on capacity, referring to space for additional emergency dialysis points, secured water sources, space for additional tanks and accessibility for patients to dialysis. The aspects further includes staffing, fire risk, laundry, meals, stock, transport, machines and equipment, hygiene, security, emergency patient diet plan, conservation dialysis and documentation.
3. Utilising **alternative water sources** such as drilling.
4. **Water conservation** strategies implemented focussed on minimizing water losses through increasing the RO recovery capacity, recycling of reject water through implementation of grey water systems. Other water conservation strategies that were implemented included installation of flow restrictors, closing of non-essential taps and water awareness campaigns.

Considering the above four concepts, the contingency dialysis plan for a water disaster, has to be considered to ensure the safety and well-being of the dialysis patients during a drought. The plan has been developed in a format that could easily be adopted and implemented. It could also be adapted and used in the event of other similar disasters.

014

Adherence to treatment and quality of life in patients with end-stage kidney disease undergoing haemodialysis

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Introduction
Chronic kidney disease (CKD) can result in the progressive loss of kidney function. Haemodialysis (HD) patients can experience a number of lifestyle changes such as dietary and fluid restrictions. Non-adherence with dialysis treatment could impact the quality of life. This study seeks to determine whether there is any correlation between the adherence to treatment and the quality of life in HD patients.

Design
A retrospective research strategy was applied in this study with a quantitative, correlative, cross-sectional design.

Methods
A sample of 50 patients was selected using retrospective blood results and quality of life questionnaire results from January to December 2016. The quality of life results was compared to the compliance of the prescribed haemodialysis treatment.

Results
The results indicated that adherence with the prescribed treatment did not have an impact on the quality of life of haemodialysis patients. More than 90% of patients dialyzed for the recommended dialysis length and frequency. However, a correlation between symptoms caused by urea and phosphate exceeding normal values was found with a probability value for urea at $p = 0.0163$ and phosphate at $p = 0.0545$.
Conclusion
There was no direct correlation found between non-adherence with the prescribed treatment and the quality of life of the sample of patients. However, the side effects of dialysis treatment and renal diet did have an impact on the patients' quality of life. In addition, the study found that haemodialysis patients dialyzing for more than one year comprehended the importance of quality of life and that adherence towards treatment would reduce symptoms and likely impact on future morbidity and mortality.

015

Evaluating patients understanding of their diagnosis of chronic renal failure and the importance of compliance on haemodialysis

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Introduction
Patients undergoing chronic haemodialysis (CHD) have many clinical challenges including water and phosphate retention, secondary hyperparathyroidism, hypertension, chronic anaemia, dyslipidaemia and heart disease. Patients are required to maintain strict fluid and dietary restrictions, use of multiple medications and educated by staff. Considering how difficult chronic renal failure (CRF) is to manage, non compliance is a problem and impacts on patient's long term survival and short term morbidity. Patients need to understand their diagnosis of CRF to facilitate compliance on the CHD programme.

Objectives
1) To evaluate patients understanding of diagnosis in CRF.

2) To determine if patients understanding of CRF contributes to non-compliance on HD programme.
3) To make recommendations to improve compliance in patients on HD.

Method
This was a quantitative cross-sectional study conducted at NRC unit in the KZN region; with patients on CHD. Information was obtained from patient files and a questionnaire. Purposive sampling method was used; 35 CHD patients participated in the study.

Results
Despite participants being educated prior to the questionnaire. Only 37% (13) understood their diagnosis and the other 63% (22) participants had minimal understanding. When evaluating participant understanding of urea, 46% (16) participants understood, while 54% (19) had no knowledge of urea or appropriate levels. Regarding fluid intake, 66% (23) of participants were compliant and 44% (12) were fluid overloaded. Inquiring about dietary restrictions and potassium intake specifically; 71% (25) participants knew about potassium and albumin; 82% (29) had minimal knowledge on the required protein intake.

Conclusion
Patients overall understanding of their disease and the required restrictions was poor, although some do understand concepts. The ultimate goal is to achieve long-lasting changes in behaviour, by providing patients and family with knowledge through education. When a patient has a clear understanding of what is expected of themselves, this will facilitate patient's understanding of CRF and compliance on the HD programme.

020

My 10 year journey – From zero to hero

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Introduction / Background
Following my previous presentations on my life, and my journey with kidney failure, I now boast 10 years post transplant and I couldn't be healthier, or more proud of my achievements. From a teenager who had to stop all sport or physical activities at 13 years old, to an athlete winning various medals at the World Transplant Games.

Methods
While still on sick leave post transplant, a friend asked me if I'd ever thought of playing bowls, as it was a non-strenuous activity and something to get me a little fitter. I tried it out, and absolutely loved it. At my first Renal Congress presentation, 5 months after my transplant, I met Prof Heilie Uys, and she introduced me to the World Transplant Games, where I started taking part in various events.

Results
The World Transplant Games is an international sporting event for transplant athletes, held every second year. It demonstrates the physical success of transplant surgery and the ability of transplant recipients to lead healthy, normal lives. The event aims to significantly enhance the understanding and acceptance of organ donation and transplantation. South Africa transplantees have been attending these Games since 1995, and have brought home many medals in the past 21 years.

Conclusions
After 5 World Transplant Games, and 5 medals, the experience of taking part in these games has changed my life completely. I have met the most amazing people from all over the world, heard the most

wonderful, as well as the saddest stories from all ends of the globe, shared laughter and tears, but above all I have found an incredible family – all related by the organ we have had transplanted. We are now training for Newcastle Gateshead, United Kingdom, for the World Transplant Games 2019.We are all heroes.

069

Contrast-Induced Acute Kidney Injury When Using Ioversol and Iomeprol: A Systematic Review and Meta-Analysis

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Introduction / Background
Loversol and Lomeprol are radiological contrast media commonly used interchangeably in many South African imaging facilities. Despite differences in chemical composition, they are presumed to have similar renal safety profiles. However, no studies directly compare the renal safety of these two contrast media for coronary angiography in a predominantly healthy population.

Methods
A systematic review was performed to establish which contrast medium is safer. Articles were sourced from Medline, CINAHL, Scopus, Science Direct, and PubMed Clinical Queries databases. Eligible studies were peer-reviewed articles of coronary angiography examinations carried out on a healthy adult population, where Ioversol and/or Iomeprol were administered, with contrast-induced acute kidney injury as the primary end-point.

Results
Six articles with a total population of 2431 patients were selected. The Cochrane Risk of Bias Tool was used in evaluating included articles. Pooling studies using the random effects model did not show a statistically-significant reduction in contrast-induced acute kidney injury when Iomeprol was administered (Risk ratio 1.14, 95% confidence interval 0.797-1.643, p = 0.466). Moderate heterogeneity (I^2=54.21%) across the studies was observed.

Conclusions
Lomeprol may be better for use in the clinical setting because of more a predictable renal safety profile despite the lack of statistical significance that was noted after meta-analysis of included studies. Further research is warranted into the effect of ethnic origin on contrast-induced acute kidney injury incidence rates.

062

Improving high volume HDF for hemodialysis patients sensitive to polysulfone-based membranes

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Introduction / Background
High volume HDF is becoming the method of choice for the treatment of hemodialysis patients. It has been shown to improve the treatment outcome and survival of patients by increasing the clearance of middle molecular weight molecules and inflammatory molecules. However, this type of treatment is not accessible for some patients because they are sensitive to polysulfone-based membranes, and alternative membranes cannot support the high convective needs of HDF. Unfortunately, the prevalence of sensitive patients appears to have increased in the last few years. This might be due to an increase in high convective treatments, as this treatment puts more strain on both membrane and blood cells. We would

like to show that it is possible to maintain the added value of high volume HDF even for patients sensitive to polysulfone-based membranes.

Results
A search of recent scientific literature showed that there were 40 cases of hypersensitivity against polysulfone/polyethersulfone (PS/PES)-based membranes reported. Within this patient group, 38 needed to be switched to an alternative membrane: 26 were treated successfully with a cellulose-based membrane, 5 with polyacrylonitrile, and 7 with polymethylmethacrylate. All of these alternative membranes have a symmetric membrane structure that is not well equipped to withstand high volume therapy. Solacea™ dialyzer is an asymmetric triacetate membrane that easily reaches a convective volume of 100 ml/min, has good removal rates for β2 microglobulin (0.85) and myoglobin (0.80), and only minor albumin loss (RR 0.01).

Conclusions
High volume HDF treatments require an asymmetric membrane to sufficiently withstand transmembrane pressures, and patients that are sensitive to polysulfone-based membranes benefit most from a cellulose triacetate membrane. Solacea combines both of these essential needs into one membrane, making it possible to maintain the benefits of high volume HDF for patients that are sensitive to polysulfone-based membranes.

Conflict of interest: Funded by Nipro Medical Europe