CP01

REPORTED HEALTH, SOCIAL SUPPORT, STRESS AND ASSOCIATIONS WITH CHOLINE INTAKE IN PREGNANT WOMEN: THE NUEMI STUDY

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Presenter: L Robb

Introduction: The health and well-being of pregnant women can influence pregnancy outcomes and are closely associated with social support and experiences of stress. Poor nutrition predisposes to poor health, with choline intake affecting pregnancy outcome.

Methods: Pregnant women attending a high-risk antenatal clinic at a regional hospital in Bloemfontein, South Africa, were included in this cross-sectional study. Trained fieldworkers obtained information during structured interviews using standardised questionnaires and anthropometric techniques. Logistic regression with backward selection ($p < 0.05$) was used to select significant independent factors associated with choline intake from variables with a p-value < 0.15 in bivariate analysis.

Results: Median age and gestation in the sample (N = 682) were 31.8 years and 32.0 weeks, respectively. Most participants (84.7%) consumed less than the adequate intake (AI) of 450 mg of choline per day. Most participants (69.0%) were either overweight or obese. One in ten participants (12.6%) reported not having anyone that could help them in times of need, more than one third (36.0%) reported having unpayable debt and almost one in ten (8.4%) reported experiencing physical abuse by their partners. Normotensive participants and those that were using antiretroviral therapy (ART) (thus HIV-infected), were more likely to consume choline in amounts below the AI (bivariate analysis p=0.042 and p=0.011, respectively). Logistic regression analysis showed that the odds of consuming choline in amounts below the AI were lower for participants that were not using ART versus those using ART, with an odds ratio of 0.53.

Conclusion: HIV-infected participants were more likely to consume choline in levels below the AI; thus, this vulnerable group should be the focus of targeted efforts to improve choline intake.

CP02

BARIATRIC SURGERY - MODIFIABLE FACTORS IN A SOUTH AFRICAN SETTING

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Presenter: HC Spies

Introduction: Bariatric surgery (BS) is often the final treatment option for obesity when others fail. This study aimed to describe modifiable pre-surgery and post-surgery aspects affecting weight regain.

Methods: An observational, descriptive cross-sectional study amongst patients who received Sleeve gastrectomy (SG) or Roux-en-Y gastric bypass (RYGBP). Data were collected using EvaSysTM questionnaires from telephonic interviews and from interdisciplinary team (IDT) files and included: socio-demographics, anthropometry, IDT visits, physical activity, substance use, dietary practices and psychological aspects.

Results: Among 100 participants, 70% received RYGBP and 30% SG; most were female (79%). Many (62%) were overweight from a young age and 93% had a family history of overweight and obesity. Post-surgery, relationship status changed in 28%; less were married and single and more were in new relationships. From the first to the second-year post-surgery, good adherence to dietitian visit attendance (>75% attendance of scheduled visits) decreased (22.0% vs 7.0%), and poor attendance (<50%) increased (43% vs 92%). Poor attendance with the dietitian (<50%) and excess weight regain (WR, > 15%) was significantly more compared to those that had good-moderate dietetic follow-ups and ideal WR (<10%) (SG, 33.3% vs 3.3%, p=0.004; RYGBP, 28.6% vs 11.4%, p<0.001). Post-surgery, physical activity (32% vs 55%) and alcohol intake (58.0% vs 63.0%) increased non-significantly and smoking (19% vs 17%) decreased slightly. Those with a poor eating diet score reduced from 64% pre-surgery to 24% post-surgery (changes included smaller portions, fewer takeaways, lower fat and sugar intake). Psychological well-being showed mixed results. Obsession with thinness improved, but severe risk for bulimia, body dissatisfaction, and overeating worsened.

Conclusion: Poor attendance post-surgery to dietetic consultations resulted in excess weight regain. Physical activity and improved dietary aspects followed BS. Minor changes were seen in substance use (less smoking and increased alcohol intake) and some psychological aspects improved like obsession with thinness.

CP03

DIABETES KNOWLEDGE, ATTITUDES AND PRACTICE AMONGST TYPE 2 DIABETICS ATTENDING THE PRIMARY HEALTHCARE CLINICS IN KIMBERLEY

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Presenter: M Alenbalu

Introduction: Diabetes is a common non-communicable disease globally. It presents an enormous public health and socioeconomic challenge worldwide. The present COVID-19 pandemic has provided more reasons why we should be concerned about diabetes.

Aim: To evaluate the Knowledge, Attitudes, and Practices toward diabetes amongst Type 2 diabetics attending the PHC clinics in Kimberley city and to make recommendations to appropriate authorities based on the study's outcomes to improve the control and prevention of diabetes complications.

Method: This study was conducted in Sol Plaatjie municipality in Kimberley, Northern Cape. A cross-sectional analytical, quantitative questionnaire-based study was done, and a convenient sampling method was used. Results: A total of 363 Type 2 Diabetic patients took part in the study. Most of the participants in this study were females (62.0%). Most respondents have good Knowledge, 67.5%, while 64.5% of the participants showed good Attitudes toward diabetes. However, only 35.8% of the participants had good Practices towards diabetes. There was a significant association between the participant's level of education and Knowledge and the Practice of Type 2 DM, with a p-value of 0.0002 and 0.0075, respectively. No significant association was found between the participant's level of education and their Attitudes toward diabetes (p=0.2416).

Conclusion: This study demonstrated good diabetes-related Knowledge and Attitude but an inadequate level of Practice among participants.

CP04

ANTHROPOMETRIC STATUS AND MACRONUTRIENT INTAKE OF BODYBUILDING ATHLETES IN THE CAPRICORN DISTRICT, LIMPOPO PROVINCE; SOUTH AFRICA

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Presenter: S Masoga

Introduction and aim: Bodybuilders in this district use various dietary practices to achieve the required body composition. The aim of this study was to determine anthropometric profile (body mass index [BMI], body fat percentage [BF%], and waist circumference [WC]) and macronutrient intake of bodybuilders, to assess the association among these variables.

Methodology: A quantitative descriptive design was used to purposively recruit bodybuilders. Ethics approval (UFS-HSD2020/1680/2302) and permission from gymnasiums were obtained. Athletes signed informed consent and demography was then collected. Anthropometric measurements included weight and height to calculate BMI, WC, mid-upper arm circumference (MUAC), and seven skinfolds to calculate BF%. Three 24-hour-recalls with a food frequency questionnaire were used to determine energy and macronutrient intake. Descriptive statistics were used to describe anthropometric status and macronutrient intake. Correlation (Pearson's) test was used to determine the relationship between variables.

Results: Ninety-three athletes, mostly males (n=77; 86.9%) participated. Mean ages were 24.5 and 23.0 years (males and females respectively). Athletes were bodybuilders for 2.5±1.4 (males) and 1.8±0.8 years (females). Mean BMI was 25.8±4.4 (males) and 24.9±3.6 (females) kg/m2. MUAC values were 35.6 and 28.3 cm in males and females respectively. Most males (81.6%) had an acceptable BF% (9.9%) compared to females (52.9%) with higher BF% (17.3%). However, 81.6% of males and all females had WC of 80.7±10.3 cm and 73.3±6.2 cm below risk levels respectively. Mean energy intake was 148 kJ/kg/day and 142 kJ/kg/day, carbohydrate was 4.7 g/kg/day and 4.3 g/kg/day (males and females respectively). Fat consumption exceeded recommendations (>1 g/kg) in both genders, however, protein consumption was optimal in males (1.4 g/kg). Anthropometric parameters (BMI, WC and BF%) positively correlated with demography but not with macronutrients.

Conclusion: Half of bodybuilders had normal anthropometry, while macronutrient intakes were not optimal. Health care professionals should monitor and educate these athletes to optimise body composition.

CP05

ANALYSING MATCH-RELATED PERFORMANCE INDICATORS IN SUPER RUGBY COMPETITIONS: A STUDY OF THE 2017-2019 SEASONS

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Presenter: M Nicholls

Introduction: Understanding the factors that contribute to success or failure in Super Rugby is paramount for teams aiming to achieve positive results. This study compares winning and losing teams by analysing match-related performance indicators from 2017 to 2019, offering valuable insights for coaches, players, and performance analysts.

Methods: The study used a retrospective design to analyse performance. Historical records and existing data were utilised to examine performance outcomes, identify patterns, and gain insights into past performance trends and strategies within Super Rugby Competitions. Data was extracted using Stratus Mobii video analysis software, specifically developed for SARU in 2013.

Results: Significantly, winning teams exhibited notable disparities in their attacking play, surpassing losing teams in total tries (4.5 vs. 2.4), offloads (12.5 vs. 11.2), number of kicks (22.2 vs. 19.4), and line breaks (3.1 vs. 2.2) ($p < 0.0001$ for all). Moreover, defensive performance emerged as a crucial factor, with winning teams demonstrating higher tackle completion rates (89.3 vs. 87.9) ($p < 0.0001$) and an increased number of breakdown turnovers won (0.8 vs. 0.6) ($p = 0.0518$) compared to losing teams.

Conclusion: These findings illuminate distinct performance characteristics that can assist coaches, players, and analysts in optimizing tactical analysis, player development, and overall performance. Despite the COVID-19 disruption in 2020 and teams transitioning to other competitions, the research remains relevant due to the expected persistence of fundamental game aspects and performance indicators. This adaptability enables informed decision-making, leading to improved performance and a competitive advantage in the current Super Rugby competition.

CP06

AGREEMENT BETWEEN COMPUTERISED AND TRADITIONAL METHODS OF CALCULATING HEART RATE VARIABILITY IN PATIENTS WITH CARDIOVASCULAR DISEASE RISK FACTORS

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Presenter: L Farland

Introduction: Heart rate variability (HRV) is an important measure to use in a clinical setting in patients with cardiovascular disease (CVD) risk factors. Although HRV has been investigated before, limited research has been done to determine the agreement between different methods to measure HRV, and about the association of HRV with CVD risk factors. The aim of this study was to determine the agreement between a computerized(C) and the traditional(T) method of measuring HRV.

Methods: Data were collected retrospectively. The study population consisted of male patients with one or more known CVD risk factor who underwent a submaximal exercise test between 2018 and 2021. The agreement was determined between the traditional and computerized HRV calculations and its association with CVD risk factors, where HRV was characterized by the SDNN and RMSSD, respectively. The association of CVD risk factors with HRV was determined through descriptive statistics and ANOVA, overall, and separately for each risk factor.

Results: The data of 27 participants with a mean age of 65.9 years were used for analysis. Hypertension was the most prevalent risk factor (70.4%) and obesity the second most prevalent (40.7%). The RMSSD measurements were near perfectly correlated (0.96). The agreement between the RMSSD measurements was higher than that of the SDNN measurements. Regarding the association of the CVD risk factors with the HRV calculations, the two strongest associations were found between smoking and RMSSD (T) (R2=0.29) and physical inactivity and RMSSD (C) (R2=0.28). Moderate associations (R^2=0.53-0.55) were found for both the RMSSD values with physical inactivity, obesity and smoking.

Conclusion: This study provided results that support the correlation between the RMSSD values as well as its agreement and associations with the different CVD risk factors. Therefore, RMSSD can be used to measure HRV within the clinical setting to assist with monitoring as part of exercise prescription for rehabilitation.

CP07

PREVALENCE OF ADHD SYMPTOMS AND THEIR ASSOCIATION WITH LEARNING-RELATED SKILLS IN GRADE 1 CHILDREN IN SOUTH AFRICA

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Presenter: M de Milander

Introduction and aim: Attention Deficit / Hyperactivity Disorders (ADHD) are developmental disorders in children with 3 symptom clusters, namely hyperactivity, attention deficit and impulsivity, and a combination. We investigated the prevalence of the 3 symptom clusters and their association with learning-related skills among children aged 6 to 7 years in Bloemfontein, Free State province, South Africa.

Methodology: The Aptitude Test for School Beginners (ASB) was applied to determine learning-related skills, and the Strength and Weaknesses of ADHD Symptoms Normal Behaviour rating scale (SWAN) was used to determine ADHD symptoms. Data on SWAN scores were available for 390 children, while data on both the SWAN and ASB were available for 345 children (189 girls and 156 boys) with a mean age of 6 years and 8 months.

Results: The prevalence of ADHD symptoms was as follows: 74.6% of the children did not fulfil the criteria for ADD/ADHD, 7.7% presented with the combined subtype, 6.7% presented with hyperactivity and impulsiveness, and 11.0% with inattentiveness. The presence of ADHD symptoms had a significant effect $p = < 0.05$ on reasoning, numerical abilities, gestalt, coordination and memory.

Conclusion: We conclude that ADHD symptoms are a significant risk factor for 5 of the 8 learning-related skills in children, namely numerical skills, memory, reasoning, gestalt and coordination.

CP08

CHRONIC DISEASES OF LIFESTYLE: A RISK ASSESSMENT AND HEALTH PROMOTION FRAMEWORK FOR A RURAL AND URBAN PRIMARY HEALTH CARE SETTING IN THE FREE STATE PROVINCE, SOUTH AFRICA

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Presenter: S van Zyl

Introduction: Non-communicable diseases (NCDs), also known as chronic diseases, are the leading cause of death globally. The WHO emphasised the persistent high prevalence of risk factors relating to chronic diseases of lifestyle (CDL) in South Africa, placing a significant burden on health systems. Effective community-based primary health care (PHC) responses can reduce CDL morbidity and mortality. This study aimed to develop a risk assessment and health promotion framework to strengthen existing efforts to prevent and control CDL in Free State (FS) communities.

Methods: A convergent mixed-method design was applied. The quantitative part of the study identified the prevalence of CDL risk factors in a rural and urban FS setting. Qualitative data obtained during focus group discussions explored participants' knowledge of CDL (patients) and related training programmes (PHC team members, medical students). Participants' experiences of the practical implementation of CDL intervention programmes in these communities were also investigated.

Results: Quantitative and qualitative data were used in combination to construct the framework. Step 1 of the framework development process identified CDL risk profiles for each study population. Step 2 identified CDL training needs for PHC teams, patient educational needs, and MBChB CDL curriculum development needs. Step 3 revealed three main barriers: resource constraints, patient noncompliance, and the lack of supporting healthcare services to effectively implement CDL programmes. Step 4 used the six focus areas identified in steps 1-3 to develop proposed strategies for implementing a tailor-made community-based patient-centred approach to facilitate the development of focused and effective PHC programmes for CDL.

Conclusion: This study provided insight into the risk profiles and specific barriers and challenges experienced in implementing CDL intervention programmes in urban and rural FS settings and highlighted the need for Public Health action. The study's findings can be valuable for planning, designing, and implementing PHC responses in resource-constrained areas.

CP09

INTERVENTIONS TO IMPROVE YOUNG MEN'S HIV TESTING UPTAKE IN KWAZULU-NATAL, SOUTH AFRICA

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Presenter: SMS Ndlovu

Introduction: HIV testing services (HTS) are an important point of entry to prevention and treatment of HIV in South Africa. Despite the availability of HTS across the region and in SA, the uptake among men remains low, especially young men residing in rural and peri-urban communities. This study aimed to explore interventions that could improve the uptake of HTS among young men in KwaZulu-Natal.

Methods: A qualitative descriptive study was conducted in which 17 young men and two healthcare providers in Ladysmith were purposively and conveniently sampled. Data was collected through semi-structured interviews using WhatsApp and landline audio calls between September and December 2021 and thematically analysed.

Results: An improvement in the healthcare provider attitudes and service delivery, the establishment of adherence clubs for young people living with HIV, ensuring a diverse and balanced healthcare provider staff composition at primary healthcare facilities, and increased demand creation in spaces frequented by men are vital for enhancing access and utilisation of HTS among young men. Additionally, healthcare providers believe that the presence of male healthcare providers, investment in health education, prioritising men in the morning at primary healthcare facilities, and establishment of male clinics within communities are key factors in improving the uptake of HTS among young men.

Conclusion: Several improvements at primary healthcare facilities need to be implemented to attract and retain young men in HTS and HIV treatment and care. These should address young men's specific needs and preferences, ensuring their comfort and engagement in healthcare.

CP11

PSYCHOSOCIAL FACTORS THAT CONTRIBUTE TO RECIDIVISM IN STATE PATIENTS NECESSITATING READMISSION AT THE FREE STATE PSYCHIATRIC COMPLEX

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Presenter: NP Makatsa

Introduction: Violence is usually a willful act, but in some people its committed under duress of a mental illness such as i state patients. State patients are mentally ill offenders deemed not trialable or accountable by the Criminal Procedure Act, No.51of 1977. They are committed as State patients under the Mental Health Act No.17 of 2002. Despite undergoing rehabilitation program conducted by a multi-disciplinary team of Mental health experts, some State patients fail to reintegration into their communities. The outcome of these patients is recidivism (a relapse into committing severe criminal offences after receiving forensic rehabilitation intervention for previous crime), with subsequent rearrest or psychiatric rehospitalisation. Research looking into psychosocial factors that lead to failed community reintegration by the state patients (according to their perspectives), with the outcome of recidivism leading to readmissions to psychiatric hospitals is limited in South Africa and globally.

Method: Study design: Qualitative and non-experimental following a purposive design. Study population: 15 State patients readmitted between 2017 and 2020 at the Forensic unit at the Free State Psychiatric Complex according to Section 48 and Section 33 of the Mental Health Act and Criminal Procedure Act. Data Capturing & Analysis: Semi-structured interviews and audio recordings were used to gain the state patients' perspectives regarding the following research questions: a) To what extent are psychosocial factors experienced as protective factors and therefore likely to increase the chances of a successful rehabilitation process of state patients? b) To what extent are psychosocial factors experienced as risk factors and therefore likely to negatively impact the rehabilitative process of state patients? Thereafter thematic analysis was conducted to generate the study's results guided by a 6-domain theoretical framework.

Results: The most significant patient factors associated with failed social(community) reintegration according to 6-domain framework were predominantly represented in the following highest scoring main domains namely: Integrated dual disorder treatment (23%); Family psychoeducation (20%) and Assertive community treatments (17%). Additional domains such as Collaborative psychopharmacology (15%); Supported employment (13%) and Illness management and recovery (11%) made smaller contributions. The main themes reflected in the top 3 domains included factors such as substance use due to idleness, boredom and unemployment; poor family or community support (psychosocial support); poor medication adherence; highly critical families (high expressed emotion) with poor insight into mental illness and management thereof. Lastly pertaining Assertive community treatments domain themes such as poor psychosocial support in community (lack of support groups availability and access); poor Healthcare operations management and poor medication accessibility were highlighted as well, as part of psychosocial factors impairing the success of social reintegration in state patients.

Conclusion: It is evident that treatment management in patients with severe mental illness and substance use disorder must address both disorders simultaneously. Secondly, medication adherence is a core component of integrated dual diagnosis treatments which warrants attention and must be

addressed timeously to ensure treatment compliance to reduce the risk of illness relapse and rates of rehospitalisation. Lastly additional resources must be directed towards Assertive community treatments in order to strengthen social reintegration and illness remission.

CP12

DEVELOPING AN IMPROVED SEIZURE DIARY AS A MONITORING TOOL FOR EPILEPTIC PATIENTS IN SOUTH AFRICA

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Presenter: CK Egenasi

Introduction: Epilepsy is a chronic debilitating disease, and a seizure diary is a tool used to monitor seizures. The seizure diary is available in two formats, paper-based and electronic diaries. This study aimed to develop an improved seizure diary for patients with epilepsy in South Africa and to determine their perception of its use.

Methods: The study had six phases: a scoping review of literature, a cross-sectional survey of patients' opinions, a modified Delphi survey of experts' suggestions, a longitudinal study of the new diary's use, a cross-sectional survey of patients' experiences, and a final design of the new diary.

Results: The scoping review identified 1125 relevant articles, of which 23 articles on seizure diaries were selected for review. The cross-sectional survey recruited 182 patients with epilepsy, of whom 65 had previous exposure to a seizure diary, and 117 did not. Most patients who had used a seizure diary found it useful, but some faced challenges. The modified Delphi survey had 12 expert panellists who agreed on 18 items for the new diary. The new diary was distributed to 139 patients who used it for six months. The second cross-sectional survey received feedback from 100 patients who used the new diary. Most patients preferred the new diary over the old one, but some found it more challenging to complete. The final version of the new seizure diary was designed for use by patients with epilepsy.

Conclusion: The study developed a new seizure diary with input from experts, patients, caregivers, and relatives. Despite a few patients reporting that they preferred the old seizure diary, most participants preferred the new one, which could be useful for managing epilepsy.

CP13

99MTC-ETHYLENEDICYSTEINEDEOXYGLUCOSE IMAGING OF SYNOVITIS IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Presenter: G Engelbrecht

Introduction: Rheumatoid arthritis (RA) is a chronic inflammatory disease that can lead to irreversible joint damage, deformities, disability and premature mortality, if not treated promptly and properly. In order to offer early and proper treatment, investigations with a high sensitivity and specificity are needed to identify active disease. The aim of this study was to investigate the utility of 99mTc-ECDG in identifying active disease in the joints of patients with rheumatoid arthritis.

Methods: A prospective study was conducted at the Department of Nuclear Medicine of University of the Free State/Universitas Academic Hospital in Bloemfontein, South Africa. Twenty-two participants from the rheumatology department diagnosed with rheumatoid arthritis according to the ACR/EULAR classification criteria were enrolled. Participants were injected with 20-25mCi of 99mTc-ECDG. Flow, blood pool, whole body, delayed static and SPECT/CT images were acquired. Known sites of disease were qualitatively assessed for intensity of uptake, and disease severity was graded (Grade 0-3).

Results: Twenty-two participants were studied. The median (interquartile range) age was 59 (49-68) years, and the majority (n = 21; 95.5%) were females. There was abnormal increased uptake of 99mTc-glucosamine noted in all sites of known disease, including unknown sites. SPECT/CT imaging localized tracer uptake specifically to the synovial space.

Conclusion: 99mTc-ECDG is a safe radiopharmaceutical that can efficiently assess disease activity in the joints of patients with RA. It accumulates in sites of both clinical and subclinical disease and might be a very useful tool for the rheumatologist in the management of patients with RA.

CP14

PREVALENCE OF ANXIETY AND DEPRESSIVE DISORDER AND THE ROLE OF COPING STRATEGIES IN COUPLES WITH INFERTILITY

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Presenter: WS Maluleke

Introduction: Infertility is prevalent in sub-Saharan Africa, and the incidence rate is 15 - 20%. Infertility is synonymous with societal discrimination and stigma, isolation of the patient, neglect by family members, blame, and partner abuse. It may lead to psychological disorders such as anxiety and depression. Objectives: To determine the prevalence of depression and anxiety and role of coping strategies in couples attending the Infertility Clinic at Universitas Academic Hospital.

Methods: A prospective cross-sectional study was conducted. Information captured included sociodemographic data and the PHQ-9 and the HAM-A were used to screen for depression and anxiety. Using the COMPI Coping Strategy Scale, coping was assessed.

Results: Two-hundred and thirty-five respondents (115 females and 120 males) were considered for this investigation. The results indicated that 21.0% and 4.2% of females and males suffered from severe anxiety. The genders differed significantly regarding anxiety classification scale ($p = 0.0003$). More females suffered from depression than males (46.1% and 16% respectively, $p = 0.0001$). Females demonstrated higher levels of usage of all four coping strategies compared to males, namely passive avoidance, active confronting, active avoidance, meaning-based coping, and passive avoidance.

Conclusions: Depression and anxiety disorders are common morbidities in patients undergoing fertility treatment at our centre, with females more affected than males. Use of passive avoidance and meaning based coping were observed among most females who had mental illness morbidity. Compared to women, men used more active confronting and passive avoidance coping strategies. Practitioners should screen for these conditions at initial patient presentation and refer patients for psychological support.

CP15

PROFILE OF CERVICAL CANCER PATIENTS AT THE DEPARTMENT OF ONCOLOGY, UNIVERSITAS ACADEMIC HOSPITAL, FREE STATE PROVINCE FOR THE PERIOD OF OCTOBER 2019 TO OCTOBER 2020

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Presenter: TP Nkashama

Introduction: Cervical cancer is one of the most common genital tract malignancies in women, and a major public health problem in the developing countries. Its incidence is expected to increase in poor and developing countries. Profiling sociodemographic data along with the clinical characteristics of these patients is the first step in planning strategies to reduce the burden of cancer of the cervix.

Objectives: To determine the profile of cervical cancer patients who attended the Oncology Department at UAH annex, focusing on their sociodemographic and clinical characteristics.

Methods: A prospective observational analysis that involved 236 confirmed cervical cancer patients who were seen at UAH Annex, Oncology Department between October 2019 and October 2020.

Results: A total of 236 cervical cancer patients were included in this study. The median age was 52 years. The age group from 35 to 44 years had the highest number of participants (29.6%). 94.9% were black women. The median parity was three. 89.9% were from poor socio-economic backgrounds. 35.0% were from neighboring Lesotho. Most of women were widows (34.7%). 48.3% had completed secondary school while 37.3% were illiterate. 47.9% had previously screened for cervical cancer, but among them only 20.7% had screened twice or more. 57.2% used tobacco while 47.1% used alcohol. Tobacco use had no effect on stage of the disease at presentation. Alcohol use had some effect on the rate of cervical cancer screening. 61.0% were HIV positive. HIV status had considerable impact on the rate of cervical cancer screening but had a mild impact on stage and histology at presentation. Progestin-only injectable was the most used contraception (66.1%) versus 2.1% for Combined oral contraceptive. 80.6% had their preliminary diagnosis at presentation based on clinical signs and symptoms. Squamous cell carcinoma was the most common type of histology (80.6%)

Conclusion: This study highlights the fact that inadequate screening and late presentation are major factors sustaining the high morbidity and mortality due to cervical cancer. Poor socio-economic conditions, lower level of education, and high HIV incidence are some of the medico-social drivers of the cervical cancer crisis. This information on the profile of cervical cancer patients is deemed helpful in planning new strategies to reduce the burden of cervical cancer.

CP16

WILL THE FATHERS IN THE HOUSE PLEASE STAND UP? ASSESSING THE FULFILMENT OF FATHER ROLES IN BETHLEHEM MEN

Authors: LF Van Deventer and WJ Steinberg

Affiliation: Department of Family Medicine

Presenter: LF Van Deventer

Introduction: Many South African men are absent from the lives of their families and children, with resultant negative consequences for their children. There is a desire amongst many South African men to be good fathers, but this desire seems to remain a distant ideal for many. Four father roles have been identified, which are: conferring identity, providing emotional security, affirming potential, and moral authority. If these roles are fulfilled by fathers, they will benefit their families significantly.

Methods: The study was conducted in two hospitals in Bethlehem, in the Eastern Free State. The study design was a descriptive cross-sectional study. Participants were recruited using convenience sampling.

Results: Most men (more than 70%) reported having a high level of fulfilment of the four father roles. Some aspects, which undermine a father's moral authority, however, such as having multiple sexual partners (34.9%), viewing pornography (52.6%), and excessive alcohol consumption (66.5%), were very prevalent.

Conclusion: There was a high level of fulfilment of the father's roles. However, there seemed to be an acceptance of certain negative male behaviours. These behaviours likely impact negatively on the health of the family unit and should be addressed.

CP17

COMMUNITY KNOWLEDGE, ATTITUDES AND PRACTICES REGARDING COVID-19 IN THABO MOFUTSANYANE DISTRICT, FREE STATE PROVINCE - 2022

Authors: RS Mokoena, J Ebonwu, I Kleinhans, S Mahanjana and B Brummer

Affiliation: Department of Community Health

Presenter: RS Mokoena

Introduction: Good adherence to COVID-19 prevention and control measures is related to people's knowledge, attitudes, and practices (KAP). In Thabo Mofutsanyana District, the proportion of reported out-of-facility COVID-19-related deaths was higher than in-facility deaths. This study aimed to assess the community KAP regarding COVID-19 in Thabo Mofutsanyana District.

Methods: A field-based survey was conducted among consenting adults (≥ 18 years) in Thabo Mofutsanyana District, from 28 February to 4 March 2022. An interviewer-administered structured questionnaire comprising socio-demographic characteristics and KAP towards COVID-19 was used for data collection. Descriptive statistics was used to describe the participants' responses. Data management and analysis was performed using Microsoft Excel 2017 and Stata version 17.

Results: A total of 666 respondents were included in the analysis, most of whom were less than 40 years (61.6%, 404/656), females (68%; 434/638), single (64.2%; 422/657) and unemployed (65.7%; 432/658). With regards to the level of education, 36.4% (240/660) reported having Matric. Regarding transmission, 88.8% (578/651) of the participants knew that anyone could get COVID-19, with television/radio (75.3%; 499/660) and social media (53.4%; 354/660) reported as primary sources of information. The majority practised mask-wearing (82%; 546/666) and social distancing (78.5%; 523/666) as prevention measures. However, 65.7% (425/660) agreed to use home remedies if there is a severe COVID-19 infection.

Conclusion: The relatively high proportion of people supporting the use of home remedies in severe COVID-19 infections is concerning. The health-seeking behaviour of the community can be enhanced by the use of educational materials on television, radio and social media since most people assess these platforms.

CP18

THE EFFECT OF THE COVID-19 PANDEMIC ON EPISTAXIS AND ANAEMIA IN PATIENTS WITH HEREDITARY HAEMORRHAGIC TELANGIECTASIA IN CENTRAL SOUTH AFRICA

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Affiliation: Departments of Haematology and Cell Biology and Otorhinolaryngology

Presenter: SJ Kennedy

Introduction: Recurrent epistaxis, which frequently results in iron deficiency anaemia and impaired quality of life, is the most frequent complication of hereditary haemorrhagic telangiectasia (HHT). Specific data to guide rare disease management during the coronavirus disease 2019 (COVID-19) pandemic is lacking.

Methods: To better define the impact of the COVID-19 pandemic on HHT, we conducted a retrospective and prospective observational descriptive review of HHT patients in central South Africa. Epistaxis severity scores (ESSs) and haemoglobin (Hb) levels before and after the start of the pandemic were compared. Variables that may have influenced epistaxis severity and anaemia were investigated, viz. (i) mask use, (ii) nasal versus oral swabs to test for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), (iii) COVID-19 disease and (iv) its management, (v) COVID-19 vaccines, and (vi) the social impact of the pandemic.

Results: Twenty-four patients with confirmed HHT were included in the study. Subset analyses revealed a clinically significant change in ESSs (≥ 0.71 minimal important difference) and Hb levels (> 2.7% biologic variation) in 6/11 (54.6%) and 12/15 (80%) patients, respectively. Clinical and social variables that may influence epistaxis severity and anaemia were identified, viz. masks, nasal swabs, heightened stress, and missed appointments due to lockdown restrictions or fears of COVID-19 exposure at a healthcare facility.

Conclusion: The COVID-19 pandemic has had a clinically significant impact on ESSs and Hb levels in patients with HHT in central South Africa. We identified several clinical and social variables that may influence epistaxis severity and anaemia. Specific strategies are needed to optimise the management of HHT during the COVID-19 pandemic.

CP19

PREGNANCIES COMPLICATED BY HELLP SYNDROME:A 2 YEAR REVIEW ON MATERNAL AND PERINATAL OUTCOMES

Authors: ST Nkoana and SM Baloyi

Affiliation: Department of Obstetrics and Gynaecology

Presenter: S Nkoana

Introduction: HELLP (Heamolysis, Elevated Liver enzymes and Low Platelets) syndrome is a serious clinical entity. It is associated with adverse fetal and maternal outcomes. It occurs in 0.2-0.6 % of all pregnancies and 10-20% of severe preeclampsia and eclampsia. According to Saving Mothers report 2017-2019, hypertensive disorders of pregnancies are the 2nd leading causes of maternal mortality in South Africa.

Aims and objectives: To determine the maternal and fetal outcomes of pregnancies complicated by HELLP syndrome at Universitas academic hospital for a period of 2 years (between January 2018-December 2019) To determine the maternal mortality rate in patients with HELLP syndrome at Universitas Academic hospital.

Methods: This was a retrospective descriptive study. Information was obtained from patients 's clinical and electronic records. Inclusion criteria: HELLP syndrome according to MISSiSiPI -Triple class classification Exclusion criteria Preeclampsia/eclampsia without any features of HELLP syndrome Primary Maternal outcomes measured were mode of delivery, ICU admission, renal dialysis and maternal death. Fetal outcomes measured were birth weight, apgar score, neonatal admission, neonatal death and still birth. Other parameters assessed were booking and HIV status

Results: A total of 49 patients were diagnosed with HELLP syndrome for a period of two years. 26 patients fulfilled Class 1 Missisipi classification and 23 were class 2. Maternal outcome 7 out of 49 (14,28%) patients were admitted to ICU,4 of those admissions were as a result of pulmonary oedema. 4 out of 49 (8,16%) received renal dialysis. 30 patients (61.22%) delivered by caesarean section and 19(38.77%) delivered vaginally. There was no HELLP syndrome related maternal death for the time period. 43 (87.7%) patients were booked and only 6 (12,24%) were unbooked. 38 (77,55%) patients were HIV negative and 11 (22.44%) were positive Fetal outcomes Birth weight: Only 4(8,16%) babies were born with normal birth weight. 7(14,2%) had ELBW 15(30,6%) were VLBW 21(42.8%)were LBW. Still births: There were 23 (53,06%) still births, important to note that 13 of those were medical terminations. Neonatal ICU admission: Of the 26 born alive 20 babies were admitted to neonatal ICU, with prematurity complications being the common reason for admission to neonatal intensive care unit. Neonatal death: 6 neonatal deaths (26%)

Conclusion: HELLP syndrome is associated with poor maternal and fetal outcomes.It's associated with increase caesarean section rate. The leading reason for ICU admission was pulmonary oedema. Maternal deaths in these group of patients is not uncommon, however in our study no maternal deaths were reported for the study period.

CP20

CAESAREAN SECTIONS AT PELONOMI HOSPITAL USING ROBSONS 10 - GROUP CLASSIFICATIONS

Authors: FO Onubeze and S Baloyi

Affiliation: Department of Obstetrics and Gynaecology

Presenter: FO Onubeze

Introduction: There are rising rates of caesarean section (CS) across the world with the resultant increase in perinatal and maternal morbidity and mortality. It is essential to study which subgroups of women are leading contributors to these rising CS rates. We identified the categories of women using the Robson 10-group classification system (RTGS) contributing to these rising CS rates. Objective: To analyze CS using Robson 10-group system in a South African Regional Hospital and to describe demographic and clinical factors associated with variations in caesarean rate.

Methods: A retrospective study of the hospital records of women delivered by CS over six months duration was analyzed. Women were categorized using the Robson 10-group system (RTGS) according to age, parity, past obstetric history, singleton or multiple pregnancies, fetal presentation, gestational age, and the modality of labour and delivery.

Results: During the period of study, there were a total of 2,574 deliveries. 1199 delivered by CS were analyzed after excluding 9 incomplete or missing data, giving a CS rate of 46.6%. The most contributor to CS rate according to RTGS were group 5 (n=389, 32.4%) and group 1 (n=218, 18.2%). The most primary indications for CS were previous CS (37.0%) and fetal distress (26.0%).

Conclusion: A significant proportion of women that had CS were repeat CS, many may have qualified for vaginal birth after CS (VBAC) but had scheduled CS instead. Providing administrative prerequisites for VBAC, improving fetal monitoring system, improving midwife to patient ratio, and auditing the appropriateness of CS indications may help to minimize the CS rates.

CP22

CONCEPTUAL MAP OF KNOWLEDGE TRANSFER IN OCCUPATIONAL THERAPY CLINICAL PRACTICE IN CENTRAL SOUTH AFRICA

Authors: A Swanepoel, EC Janse van Vuuren and S Nayar

Affiliation: Department of Occupational Therapy

Presenter: A Swanepoel

Introduction: Empirical evidence has confirmed that all types of knowledge (propositional, procedural, personal, and client) contribute to evidence-based practice and should be transferred in clinical practice to inform quality service delivery. However, it is unclear how the integration of the types of knowledge that are transferred in clinical practice manifest. Given this gap in understanding, the current research sought to build a conceptual map of knowledge transfer in clinical practice in central South Africa.

Method: A qualitative approach was followed, and data to build the conceptual map was obtained from a scoping review that explored the landscape of knowledge transfer in occupational therapy clinical practice, nine semistructured interviews with occupational therapists working in central South Africa, and a Q Method survey.

Results: The conceptual map-building process delivered a multidimensional, multidirectional conceptual map consisting of four concepts (theory and research, practice experience, patient-therapist relationship, and patient's voice in clinical practice) and four types of knowledge (propositional, procedural, personal, and client). The results show the integration of the types of knowledge and confirm knowledge transfer in clinical practice to be a complex and ongoing process.

Conclusion: The conceptual map, a first of its kind in South Africa, presents empirical evidence of knowledge that is created and transferred in clinical practice in central South Africa. The conceptual map might provide a framework for collaboration amongst all stakeholders, such as clients, occupational therapists, and academics, to produce practice guidelines and occupational outcome measures to support evidence-based clinical practice.

CP23

THE DEVELOPMENT AND IMPLEMENTATION OF A MODEL TO FACILITATE SELF-CARE OF THE PROFESSIONAL NURSES CARING FOR CRITICALLY ILL PATIENTS

Authors: MG Chipu and C Downing

Affiliation: School of Nursing

Presenter: MG Chipu

Objectives: This study is aimed to describe the development, implementation, and evaluation of the model's effectiveness to facilitate self-care of professional nurses caring for critically ill patients in ICUs.

Methods: The methods of Chinn and Kramer, Walker and Avant were utilized to generate this model. The study included four steps to develop, implement and evaluate the model: Step 1- concept analysis, Step 2-placing concept in relationship statements; Step 3-description and evaluation of the model; and Step 4-implementation and evaluation of the model. The implementation and evaluation of the model included two phases: a one-day workshop to present the model, and three months of model implementation. The study was conducted in a specific tertiary hospital in Gauteng Province, South Africa. Twenty-five participants were identified amongst the five ICUs, and only eight participants accepted the invitation, only six professional nurses working in different ICUs in the public sector were interviewed.

Results: The model was divided into three stages: relationship, working, and termination; it comprised the primary and secondary contexts in which the facilitation of self-care occurs. The model process occurred in a spiral form. The registered nurses benefitted holistically from the three presenters at the workshop, and the social worker contributed to the emotional self-care activities. Three themes emerged: The model brought positive experiences, change and self-awareness; the model benefitted the registered nurses holistically; role modelling self-care practices motivated and benefitted others.

Conclusion: The model implementation assisted the registered nurses in developing self- awareness and resilience. They gained more knowledge regarding self-care and the model encouraged them to implement self-care practices. They became role models of self-care and motivated their friends and family.

CP24

FEEDING PRACTICES OF MOTHERS WITH CHILDREN ATTENDING ECD CENTERS IN THE XHARIEP DISTRICT

Authors: AC Carson-Porter

Affiliation: Department of Nutrition and Dietetics

Presenter: AC Carson-Porter

Introduction: The health and nutritional status of children under five years are indicators of development, social progress and access to resources within communities. In developing countries, undernutrition is a major contributing factor to children failing to achieve their developmental potential. Young children become vulnerable to malnutrition when complementary foods are introduced and breastfeeding is discontinued. The 2016 South African Demographic and Health Survey reported that 27% of children younger than five years were stunted. Thus, complementary feeding practices in South Africa need to be addressed.

Methods: A qualitative study explored the feeding practices of mothers with children 2 - 6 years who attend early childhood development centres in Trompsburg, Jagersfontein and Springfontein. These are rural towns affected by unemployment. Semi-structured interviews were used to determine the mothers' choices and motivation for the foods they fed their children until data saturation was reached. Thematic analysis was used to analyze the data, and identify themes while descriptive statistics described the participants.

Results: The mean age of the participants was 31 years, and the mean level of education was grade 8. Unemployment and the level of education of mothers affected when nutritious foods were offered. Loans and store credit contributed to household food security but were simultaneously detrimental to the overall household funds available. The availability of water and the amount of money spent on electricity influenced food choices. Furthermore, nutrition knowledge from family and neighbours was implemented, while the information provided by health care professionals at clinics was less likely implemented due to lack of access to recommended food.

Conclusion: The effects of unemployment and mothers' education levels should be acknowledged when policymakers recommend feeding practices for young children. However, it would be worthwhile to teach recipients of social grants to budget their money and thus discourage the use of loan sharks and store credit.

CP25

THE EFFECT OF A MOTOR INTERVENTION PROGRAMME FOR LEARNERS IDENTIFIED WITH MODERATE TO SEVERE INTELLECTUAL DISABILITIES

Authors: JMM Fernandes, M de Milander and E van der Merwe

Affiliation: Department of Exercise and Sport Sciences

Presenter: M de Milander

Introduction and aim: Intellectual disabilities (ID) cause problems in intellectual and adaptive functioning which negatively affect motor proficiency levels. This study investigates the impact of a motor intervention programme on the motor proficiency levels of learners identified with moderate to severe ID.

Methods: A quasi-experimental design was used to recruit participants which included 46 learners aged 15-17 years, identified with moderate to severe ID, selected from a South African special school. Participants were randomly divided into two groups. The 15 experimental learners received a 30-minute motor intervention programme, 3 times a week for a period of 6 weeks, whereas the 23 control learners continued with their normal physical education classes. Groups were assessed using the Bruininks-Oseretsky Test of Motor Proficiency, second edition (BOT-2) Brief Form.

Results: The motor intervention programme significantly improved the total scores ($p = 0.0380$) and the overall motor proficiency levels ($p = 0.0447$) of the experimental group.

Conclusions: This study reveals evidence that a motor intervention programme can be used as an effective means to improve the motor proficiency levels of learners with moderate to severe ID. A motor intervention should be implemented as soon as possible to enhance the motor proficiency levels of these learners.

CR01

THE LOCAL CONTROL OF T4 BREAST CANCER LESIONS AT 5 YEARS POST TREATMENT IN THE FREE STATE. ARETROSPECTIVE STUDY FROM 01/01/2010-31/12/2014 Authors: Grobler DC

Authors: DC Grobler

Affiliation: Department of General Surgery

Presenter: DC Grobler

Introduction: The 5-year outcome of patients in the Free State, South Africa with T4 (a, b, c) breast cancer and treatment they received.

Methods: 165 of 1652 patients fulfilled the inclusion criteria. Data sheets were completed with regard to tumour histology, treatment received and the clinical course of the patient during the 5-year follow-up period.

Results: The average age was 60.9 years. The majority had T4b (73.33%) lesions and ductal carcinoma. 69.9% were hormone receptor positive, 10.9% HER2 overexpressed and 16.3% triple negative. 75.15% were referred pre-mastectomy. 41.2% received multimodal therapy. Of these patients 31,2% had local/systemic events and 5 year outcomes were: 11.7% demised prior to the 5 year follow-up completion, 41.1% survived the 5 year follow-up and 58.54% were lost to follow-up. Compared to patients that received surgery upfront which had 43.2% local/systemic events and 5 year outcomes of 13.5% demised and 24.3% survived and 62.1% was lost to follow up. The total lost to follow up rate was 58.54%. 75% had R0 resection and the majority of lymph node harvest is between 5-15 which is suboptimal when compared to international literature as more than 16 nodes are regarded as sufficient. (5,6)

Conclusion: Multimodal therapy had a superior 5-year outcome with regard to loco-regional disease and overall survival. The lost to follow up rate was high amongst the patients which is concerning. The hormone receptor positive subgroup had the best outcome. Our institutions free margin and lymph node harvest numbers are sub optimal in comparison to international standards.

CR02

THE CUT-OFF AGE FOR GASTROSCOPY IN THE MANAGEMENT OF DYSPEPSIA PATIENTS IN A TERTIARY HOSPITAL IN CENTRAL SOUTH AFRICA

Authors: ET Kayombo and SAJ Smit

Affiliation: Department of General Surgery

Presenter: ET Kayombo

Introduction: Dyspepsia is a widespread medical condition; it confers a poor quality of life on the patient, although survival is not affected, with an urge cost to the economy. The American College of Gastroenterology/Canadian Association of Gastroenterology (ACG/CAG) is among the most followed guidelines worldwide for managing dyspepsia patients, including Central South Africa. However, the ACG/ACG uses the cut-off age of 60 for gastroscopy, which may be inappropriate for Central South Africa due to the epidemiological differences.

Objective: To demonstrate that the cut-off age of 60 used for gastroscopy in managing dyspepsia patients may be inappropriate for Central South Africa. The argument will be supported by a high prevalence of significant pathology on gastroscopy among young dyspepsia patients with no alarm signs.

Method: A retrospective record review of dyspepsia patients, without alarm signs, aged 18 to 59 years, who had gastroscopy in one of the academic hospitals in Central South Africa between 01, 2018 and 08, 2019.

Results: The study included 167 (3.6%) patients out of the 4,588, with 40.7% (68/167) of patients having significant pathology. The median age of significant pathology was 43 years. The study also found that 20.3% of patients (34/167) had a normal gastroscopy and 38.9% (65/167) of patients with benign pathology.

Conclusion: The study concluded that many young dyspepsia patients without alarming features have significant pathology on gastroscopy 40.7% (68/167). The cut-off age of 60 may be inappropriate for Central South Africa. We suggest further local studies and a review of the cut-off age.

CR03

THE PROGNOSTIC VALUE OF 99MTC-ECDG IMAGING IN PATIENTS WITH RHEUMATOID ARTHRITIS

Authors: O Evbuomwan, G Engelbrecht and JB van Rensburg

Affiliation: Departments of Nuclear Medicine and Internal Medicine

Presenter: JB van Rensburg

Introduction: There are known poor prognostic factors that have been known to be associated with a more severe form of rheumatoid arthritis. Nuclear medicine functional imaging has shown great value in the identification if active disease in patients with rheumatoid arthritis and is increasingly being used in this regard. However, its prognostic value has not been well evaluated yet. In this study our aim was to evaluate the prognostic value of 99mTc-ECDG imaging in patients with rheumatoid arthritis.

Methods: Twenty-two participants diagnosed with RA by an experienced rheumatologist were recruited into the study. Blood samples were obtained from each participant for baseline CRP, ESR, RF and anti-CCP antibody titre. On the same day, each participant was injected with 20-25mCi of 99mTc-ECDG. Planar and SPECT/CT images of known were acquired up to two hours after radiopharmaceutical administration. Affected joints were qualitatively assessed and graded for 99mTc-glucosamine uptake and compared with laboratory blood results.

Results: All 22 participants had abnormal increased uptake of tracer, in their affected joints. Fourteen participants (63.6%) had raised RF and anti-CCP antibody titers. Sixty-two percent (62%) of participants with raised RF and anti-CCP antibodies had grade 3 uptake, and the remaining 38% had grade 2 uptake. There was a significant correlation between higher grade uptake and the presence of RF and anti-CCP antibodies (p value, 0.031).

Conclusion: Our study showed a good correlation between high-grade disease on imaging and the presence of RF and anti-CCP antibodies in patients with RA.

CR04

STRATEGIES TO ENHANCE THE APPROACH TO PROSTATE CANCER SCREENING OF AFRICAN MEN IN THE FREE STATE

Authors: MOA Benedict, WJ Steinberg, FM Claassen, N Mofolo and C van Rooyen

Affiliation: Departments of Family Medicine, Urology and Biostatistics

Presenter: MOA Benedict

Introduction: Prostate cancer (PCa) is a significant health concern in South Africa, particularly among African men. Despite the potential benefits of prostate-specific antigen (PSA) screening, knowledge and practice gaps exist among healthcare providers and users. This study aims to identify these gaps and propose strategies to enhance PCa screening in the Free State Province.

Methods: The study consists of five complementary studies. The first profiles Black South African men with PCa, highlighting high prevalence and poor knowledge and screening uptake. The second assesses primary healthcare providers' knowledge, attitudes, and practices, revealing overall deficiencies, particularly among certain groups. The third investigates African men's knowledge, cultural beliefs, and screening intentions, identifying factors influencing their intention to screen. The fourth and fifth studies conduct a scoping review and a modified Delphi survey to propose strategies addressing the identified gaps.

Results: The findings indicate the prevalence of aggressive PCa among African men in the study setting. Poor knowledge, low awareness, and limited screening uptake were observed. Cultural beliefs influenced screening behaviour, while factors such as fear, perceived benefits, situational barriers, and perceived risk affected screening intentions. Primary healthcare providers demonstrated inadequate knowledge, neutral attitudes, and poor practice related to PCa screening. Lack of continuing education on PCa was associated with deficiencies among healthcare providers.

Conclusion and Recommendation: This study reveals gaps in PCa screening among African men and primary healthcare providers in the Free State Province. Targeted interventions are crucial to enhance screening uptake and outcomes in this population. Proposed strategies emphasize community-oriented approaches, engaging providers and community members. Culturally sensitive and user-friendly PCa cancer health education in public spaces is recommended. Action is needed to address these gaps and improve screening practices in African men.

CR05

RADIOLOGY BLUES: COMPARING OCCUPATIONAL BLUE-LIGHT EXPOSURE TO RECOMMENDED SAFETY STANDARDS

Authors: M Wentzel, J Janse van Rensburg and JJ Terblans

Affiliation: Department of Clinical Imaging Sciences and Department of Physics (NAS)

Presenter: M Wentzel

Introduction: The blue-light hazard is a well-documented entity addressing the detrimental health effects of high-energy visible light photons in the range of 305 nm - 450 nm. Radiologists spend long hours in front of multiple light-emitting diode (LED)-based diagnostic monitors emitting blue light, predisposing them to potentially higher blue-light dosages than other health professionals. We aimed to quantify the blue light that radiology registrars are exposed to in daily viewing of diagnostic monitors and compared this with international occupational safety standards.

Method: A limited cross-sectional observational study was conducted. Four radiology registrars at two academic hospitals in Bloemfontein from 01 October 2021 to 30 November 2021 participated. Diagnostic monitor viewing times on a standard workday were determined. Different image modalities obtained from 01 June 2019 to 30 November 2019 were assessed, and blue-light radiance was determined using a spectroscope and image analysis software. Blue-light radiance values were compared with international safety standards.

Results: Radiology registrars spent on average 380 min in front of a diagnostic display unit daily. Blue-light radiance from diagnostic monitors was elevated in higher-intensity images such as chest radiographs and lower for darker images like MRI brain studies. The total bluelight radiance from diagnostic display units was more than 10 000 times below the recommended threshold value for blue-light exposure.

Conclusion: Blue-light radiance from diagnostic displays measured well below the recommended values for occupational safety. Hence, blue-light exposure from diagnostic monitors does not significantly add to the occupational health burden of radiologists.

CR06

RE-EVALUATING THE PREDICTIVE VALUES OF PAP-SMEAR FOR DIAGNOSIS AND LLETZ MARGIN STATUS FOR MANAGEMENT OF PRECANCEROUS CERVICAL LESIONS

Authors: MM Mohosho and MH Botha

Affiliation: Departments of Obstetrics and Gynaecology UFS and Stellenbosch University

Presenter: MM Mohosho

Introduction: The incidence of HPV infection, precancerous cervical lesions and cervical cancer is relatively high in sub-Saharan African countries. There is significant variability among such countries and worldwide in the accuracy of screening for precancerous cervical lesions and test for cure after excision. Implementation and interval between these procedures also vary.

Objective: The aim of this study was to determine the predictive values of Pap-smear for screening and LLETZ for proof-of-cure in a South African hospital setting. Patients and Methods: In the current study, the positive and negative predictive values of Pap-smear screening for the identification of low-grade and high-grade squamous epithelial cervical lesions (LSIL and HSIL, respectively) and Large Loop Excision of the Transformation Zone (LLETZ) procedures for the assessment of residual lesions were determined in a South African hospital setting. Patients referred to the hospital because of abnormal Pap-smear results were included.

Results: Pap-smear screening was found to have a positive predictive value of over 90% for HSIL, indicating that this procedure is a reasonable low-cost method of screening for cervical cancer in this setting. Conversely, LLETZ displayed more modest PPV and NPV of 58% and 62%, respectively, for prediction of residual and completely excised lesions.

Conclusions: Pap-smear testing had reasonable PPV (>90% for HSIL) to be effectively used as a low-cost screening method in a middle- to low-income South African hospital setting. The predictive values of LLETZ margin status was questionable, justifying careful follow-up after negative margin status. These results justify the consideration of post-LLETZ follow up pap-smear within 3-4 months for both positive and negative margin status, this may prevent under or over treatment of women with precancerous cervical lesions.

CR07

WEIGHT REGAIN FOLLOWING BARIATRIC ROUX-EN-Y GASTRIC BYPASS OR SLEEVE GASTRECTOMY IN A SOUTH AFRICAN SETTING

Authors: HC Spies, S Swart and VL Van den Berg

Affiliation: Department of Nutrition and Dietetics

Presenter: HC Spies

Introduction: Bariatric surgery (BS) is a successful treatment for long-term weight loss in morbidly obese patients; however, weight regain (WR) remains a problem. This study aimed to investigate WR after BS in a South African setting.

Methods: An observational, descriptive cross-sectional study amongst patients who received sleeve gastrectomy (SG) or Roux-en-Y gastric bypass (RYGBP) from 2009 to 2018. Socio-demographics, anthropometry, medical, biochemistry, and quality of life (QoL) data were collected using EvaSysTM questionnaires from telephone interviews and interdisciplinary files from March 2020 to January 2021.

Results: Among 100 participants, 70% received RYGBP and 30% SG (mean age: 49.5 years and 48.0 years, respectively). Significantly more females (79%) than males received BS (p=0.047), particularly in the RYGBP group. The SG group was significantly longer, 9.0 years post-surgery, compared to the RYGBP group of 6.3 years (p=0.0001), and had a higher initial median weight (140.5kg vs. 126.0kg). The total median weight loss percentage (TWL%) was similar (SG 36.4% vs. RYGBP 38.1%). Excess weight loss percentage (EWL%) was significantly less in the SG group (44.2% vs. 61.6%) (p=008), resulting in a higher median nadir weight in the SG group (87kg vs. 77.5kg) (p=0.035). Bariatric surgery was successful, with 63% of participants classified as good responders (≥50% EWL%), although the SG group were significantly lower responders (40% vs. 72.9%) (p=0.002). The total median WR% was 23.3%, with the SG group gaining significantly more weight (32.3% vs 21.7%) (p=0.032). Two-thirds (67%) experienced excess WR (>15%) and more so in the SG group (73.3% vs. 64.3%). Improvement in self-reported comorbidities and QoL, although anaemia slightly worsened.

Conclusion: Significant WR was seen among participants that received BS in a South African setting. The RYGBP group achieved higher TWL% and EWL%, with lower WR%. Comorbidities and QoL improved following BS.

CR08

NUTRITIONAL PROFILE OF PATIENTS WITH TUBERCULOSIS AT STANDERTON TUBERCULOSIS SPECIALISED HOSPITAL

Authors: J Wessels, M Nel and CM Walsh

Affiliation: Departments of Nutrition and Dietetics and Biostatistics

Presenter: CM Walsh

Introduction: Tuberculosis (TB) is strongly influenced by nutritional status, with nutrition interventions being likely to have an impact on the prevalence of disease, response to drugs, quality of life and prognosis. The aim of this study was to determine the nutritional profile of patients with TB and TB and human immunodeficiency virus (HIV) co-infection.

Methods: A cross-sectional study was undertaken. A structured interview was conducted to determine the nutritional profile and risk of malnutrition in participants with pulmonary TB. Demography, experience of food-related side effects, the Malnutrition Universal Screening Tool (MUST) score, anthropometric indicators and biochemical parameters were assessed. Anthropometry was measured using standard techniques and biochemical parameters were part of the routine hospital procedure.

Results: 100 newly-admitted patients (60 males and 40 females), with a median age of 39.2 (range 20.3-63.5) years were selected. More than two-thirds of participants (68%) were HIV-infected. Food-related side effects included loss of appetite (59%) and dry mouth (48%). According to the MUST, 70% had a high risk of malnutrition. Median body mass index (BMI) of males was 18.2 kg/m² (underweight); and females 20.6 kg/m² (lower normal). About half of participants had low MUAC measurements (51%) and triceps skinfold measurements below the 15th percentile (49.9%), indicating malnutrition. Males had significantly lower median triceps skinfold measurements than females (13.0 mm vs 19.5 mm, 95%CI [-10; -2]). Most participants had low albumin and haemoglobin levels, with significantly more males than females presenting with low haemoglobin (96.7% vs 85.0%, 95%CI [0.4%; 25.9%]) and low albumin (86.7% vs 67.5%, 95%CI [2.7%; 35.9%]).

Conclusion: Patients with both TB and TB and HIV co-infection had a compromised nutritional status and an increased risk for developing malnutrition. Interventions aimed at addressing malnutrition could make a meaningful contribution to improving outcome and quality of life in these patients.

CR09

ASSESSING THE STATE OF PUBLIC HEALTH SERVICE DELIVERY: CASE OF THE FREE STATE PROVINCE, SOUTH AFRICA

Authors: M Biljohn, I Davids, CJ Heunis, P Chikobvu, M Litheko, C Barrett, R Nathan, T Manasseh, and O Bokang

Affiliation: Department of Community Health, Centre for Health Systems Research, Free State Department of Health, School of Clinical Medicine and Universitas Academic Hospital

Presenter: P Chikobvu

Introduction: Despite the implementation of various strategies to improve public health service delivery by the South African government, poor service delivery is often cited as a major weakness leading to citizen distrust. It is necessary to assess the state of public service delivery by considering the efficacy of strategies to improve service delivery. Health care workers (HCWs) are central to the performance of the public healthcare system and their perceptions about the service improvement strategies are key. This study assesses HCWs' perceptions whether such strategies have contributed to improvement of public health service delivery in the Free State.

Methods: This study was a cross-sectional online survey conducted among all HCWs in the province using a structured questionnaire with Likert scale measurements among all HCWs. The survey assessed three components: i) appropriateness and coherence, ii) efficacy and effectiveness and iii) impact and sustainability of the regulated strategies for public healthcare service improvement.

Results: A total of 443 HCWs completed the e-survey of which 46% had more than 15 years' work experience and 40% were assistant or deputy directors. Most (78%) of the respondents opined that the Batho Pele (People First) strategy has been a valuable tool in promoting citizen-centeredness in service delivery. However, only 43% of the respondents perceived this strategy to be well implemented. Also, nearly 89% of HCWs believed that alignment of the citizen-centered strategies with other service delivery-improvement mechanisms should be improved. Just over 50% of the HCWs agreed that application of the citizen-centered strategies has resulted in improved delivery of services to citizens.

Conclusions: The study describes the perceptions of providers on public health service delivery. The implementation and alignment of the Batho Pele and other service delivery improvement strategies needs to be improved. Further research is required to assess the views of the public service users.

CR10

ASSOCIATIONS BETWEEN REPORTED HEALTH AND LIFESTYLE AND BIRTH OUTCOME OF PREGNANT WOMEN: THE NUEMI STUDY

Authors: EM Jordaan, G Joubert, L Robb, J Ngounda and CM Walsh

Affiliation: Departments of Nutrition and Dietetics and Biostatistics

Presenter: EM Jordaan

Introduction: A healthy lifestyle contributes to a successful pregnancy. Associations between reported health and lifestyle and birth outcome of pregnant women attending the antenatal clinic at a hospital in Bloemfontein were determined.

Methods: This quantitative, cohort analytical study included 331 mothers and their 347 babies. Information related to reported hearth and lifestyle were obtained with a questionnaire. Gestational age, birth weight and length were obtained from the Road to Health Booklet of each neonate. Logistic regression with backward selection ($p<0.05$) was used to select significant independent reported health and lifestyle factors associated with poor birth outcome (prematurity or low length-for-age or low weight-for-length). Variables with a p-value <0.15 on bivariate analysis were considered for inclusion in the model.

Results: Poor birth outcome was observed in 36.3% (116/320) of women. Bivariate analysis found that more women who smoked while pregnant or were in real danger of being killed by criminals (themselves or a close family member) had a poor birth outcome. Significantly more women who had a husband or partner they could always talk to, had a first-born child born full term, did not experience weight loss of more than 3 kg during the pregnancy or who was pregnant with singletons experienced a good birth outcome. The logistic model indicated that the odds of experiencing poor birth outcome were higher for women who were in real danger of being killed by criminals (themselves or close family member) (OR:3.30), experienced weight loss of more than 3 kg during the pregnancy (OR:2.09) or who were diagnosed with or treated for high blood pressure during the pregnancy (OR:2.06).

Conclusion: Significant associations between reported health and lifestyle factors and birth outcome were identified. Pregnant women should be educated on the risks of poor lifestyle choices during pregnancy and encouraged to use available support networks.

CR11

PIONEERING INITIATIVES FOR DIABETIC CARE IN AFRICAN PRIMARY HEALTH CARE SERVICES

Authors: M Reid, L Talbot, M Pienaar, E Janse van Rensburg, M Nel, L Radebe, D Krige, E Opisa, J Swanepoel, M le Roux, CM Walsh and C Hassan

Affiliation: School of Nursing, Departments of Nutrition and Dietetics, and Biostatistics

Presenter: M Reid

Introduction: In Africa, patients in need of diabetic care are primarily served by under-resourced public health systems. These patients often live in poor socioeconomic conditions. Against this context, limited health literacy can be expected. Therefore, pioneering initiatives are needed in Africa to address the contextual health challenges faced by patients with diabetes.

Methods: The Framework for the Development and Evaluation of Complex Interventions structured the multimethod research. Studies included a concept analysis of Health Dialogue, the development and implementation of an Observational Checklist of Health Dialogue Elements (OCHDE), Knowledge, Attitude, and Practice studies of diabetes role-players, an exploration of face-to-face peer support for patients diagnosed with diabetes, the use of traditional folk media in diabetes education, development and application of the Sesotho Health Literacy test and the development of a Diabetes Self-Management Guide. The studies included patients diagnosed with diabetes, community members, and healthcare workers within the African context. Sub-study analysis was followed by a synthesis of results, informing further studies.

Results: The characteristics of the Health Dialogue concept analysis were an equal symbiotic health relationship, reciprocal health communication, and a health message. The OCHDE tested as reliable as other communication skills assessment tools to be used in a real-life clinical setting, particularly involving patients with chronic conditions, but also suitable as a tool to train/assess health communication skills or to conduct research. The use of health dialogue elements during nurse-patient communication was diverse. Diabetes-related Knowledge, Attitude, and Practice scores varied between patients, community health workers, and nurses. A face-to-face peer-support intervention significantly improved the diastolic blood pressure of adults with type 2 diabetes. Traditional folk media can raise diabetes awareness among indigenous language groups. The developed 10-item Sesotho health literacy test (internal reliability Cronbach'sα = 0.77; good convergent and predictive validity), indicated the need for healthcare providers to be sensitive about patients' health literacy levels. Design principles emanated from the developed Diabetes Self-Management Guide.

Conclusion: Currently, research focuses on exploring infographic use for patients diagnosed with diabetes who have limited health literacy.

CR12

AN OCCUPATIONAL PERSPECTIVE FOR ENABLING ENVIRONMENTS IN RESIDENTIAL AGED CARE FACILITIES (RACFS) IN SOUTH AFRICA

Authors: M Kilian, TR van der Merwe and SHJ du Toit

Affiliation: Department of Occupational Therapy

Presenter: M Kilian

Introduction: As the number of older adults living with major neurocognitive disorders in residential care facilities grow, pressure on facilities and occupational therapists to provide evidence-based and collective excellent person-centred care increases. In a developing country such as South Africa, where very few occupational therapists practice in the long-term aged care sector, this is a challenge. Assessment tools like the Residential Environmental Impact Scale (REIS) could support a whole context perspective towards improved residential aged care practices in promoting wellbeing and quality of life of residents.

Methods: A mixed methodology with a qualitative focus and thematic analysis was used to investigate the barriers and enablers towards occupational engagement of residents living in long-term care environments. The REIS assessment tool and the nominal group technique (NGT) was used as data collection procedures.

Findings: Organisational features presenting barriers and enablers to engagement and Experiences of Occupational (in)justice were identified as the two encompassing themes. This included findings related to environmental risk and support factors, a predominating biomedical care culture, dementia illiteracy, successful person-centred approaches, ill-being, and well-being of residents. Moreover, several occupational justice issues experienced by various stakeholders in South African RACFs, which in addition to institutional and bureaucratic behaviours, influenced collaboration towards promoting well-being for residents.

Conclusion: Occupational therapists have an important role to play in supporting the initiation, expansion, and modification of quality residential facilities for elders. Residents are often subjected to long-term care environments that limit occupational choices, reducing elders to mere care recipients who are no longer autonomous stakeholders in their communities. To legitimise suggestions for modifying long-term care environments, occupational therapists need practice-based evidence to demonstrate how occupation, or the lack thereof impacts health and wellbeing. The REIS provides empirical evidence that guides occupational therapy practice towards influencing organisational culture change and transformation of RACFs.

CR13

LANGUAGE MATTERS: EXPLORING THE LANGUAGE BARRIERS BETWEEN DIETITIANS AND MOTHERS DURING NUTRITION COUNSELLING RELATED TO THE FIRST 1000 DAYS OF LIFE

Authors: PT Jansen

Affiliation: Department of Nutrition and Dietetics

Presenter: PT Jansen

Introduction: South Africa is a rich melting pot of cultural and linguistically diverse citizens. There has been a growing concern by health care professionals to serve linguistically diverse patients. Dietitians often do not share the same language as their patients. The role of language is particularly important in health interventions and assists in achieving behavior change. The double burden of malnutrition is a serious public health concern, with maternal and child malnutrition being a major contributor. The first 1000 days of life refers to the critical period of development between conception and two years of age. Adequate nutritional care is invaluable during this period and without it, sets the tone for poor health outcomes into adulthood. Nutrition education is essential in addressing the double burden of disease during the first 1000 days of life. It is well known that language barriers may lead to ineffective communication between dietitians and patients. Therefore, this study aimed to determine the language barriers between dietitians and mothers of infants and young children during dietetic consultations related to the first 1000 days of life.

Methods: A phenomenology qualitative study design was used which related to the language barriers between dietitians and Sesotho speaking mothers of infants and young children. The study involved unpacking the dietitians' lived experiences and collecting data through conversational interviewing techniques. Sesotho is the most spoken language in the Free State. A total of 22 participants were interviewed at 10 institutions over four districts in the Free State province. The data was voice recorded and transcribed verbatim. The transcribed data was imported into the NVivo software where the researcher coded the data to identify four major themes and subthemes.

Results: The 22 participants worked in hospitals and clinics at various institutional levels. The participants ages ranged from 24 to 39 years of age. Most (54%) had more than five years of work experience. Almost 60% of the participants reported that they were fluent in Afrikaans and English. Whereas less than 10% were fluent in one or more African languages. All participants reported that they experienced language barriers. The reasons for the language barriers were attributed to various factors. Some of these included dietitians with a lack of language proficiency in Sesotho. Mothers with a lack of language proficiency in English or Afrikaans. It also included Sesotho speaking mothers who were resistant to receive healthcare services in English. More than half of the participants reported difficulty explaining terms/concepts in Sesotho which were related to the first 1000 days of life. The participants also identified strategies to overcome language barriers. These strategies were unanimous among the participants and included the use of interpreters, codeswitching, visual aids, and nutritional education in Sesotho. Furthermore, the participants made various recommendations to overcome the identified language barriers. Participants also recommended that the human resource policies in institutions and the language policies in academic institutions be reviewed.

Conclusion: All the participants reported experiencing language barriers with Sesotho speaking mothers. Furthermore, the participants identified various strategies to overcome the language barriers which were often met with a lack of support from the employing institutions. This research

study provides significant value in the real-world setting for dietitians, nutritionists, and patients. Currently, there is limited research on language barriers in healthcare within the South African context despite the country having eleven official languages. There is also limited research regarding appropriate Sesotho nutrition and medical terminologies. It recommended that the research be repeated in different populations to identify the true complexity of language barriers.

CR14

THE SUPPORT NEEDS OF FAMILIES RAISING CHILDREN WITH INTELLECTUAL DISABILITY

Authors: MJ Modula

Affiliation: School of Nursing

Presenter: MJ Modula

Introduction: The deinstitutionalisation of children suffering from intellectual disability (ID) is a global phenomenon. Most families raising such children experience a range of difficulties and require supportive systems to cope with physical, social and mental demands in a home environment. The aim of this study was to explore and describe the support needs provided to families raising children with ID in the Capricorn District of the Limpopo province, South Africa.

Method: In-depth individual interviews and focus group discussions were conducted with 26 families directly affected by the experience of caring for and raising children with ID in Capricorn District of the Limpopo province. Inductive thematic analysis was used to identify, categorise and organise the responses of the participants converted into intelligible statements with the assistance of Atlas. Ti version 8.

Results: Participants identified support needs on information regarding care and management of the children with intellectual disabilities, professional collaboration on safety of the children, community involvement on the rearing of the children and improvement of their living conditions as most of the families and households were female-headed, of low income and needed further monetary support. Overall, the totality of challenges, demands and inadequate support services coalesced in marginalisation of children with ID and their families.

Conclusion: Families raising children with ID are diverse and complex with unique support needs. Therefore, a multilayered approach should be taken to address the concerns and improve the families' quality of life. A foreseen challenge would be to secure the involvement of the stakeholders representing a variety of sectors, organisations and services.

CR15

CORRELATION BETWEEN CAROTID INTIMA-MEDIA THICKNESS AND PATIENT OUTCOMES IN CORONARY ARTERY DISEASE IN CENTRAL SOUTH AFRICA

Authors: TV Mokoena, L Botes, SC Brown and FE Smit

Affiliation: Departments of Health Sciences, CUT, Paediatrics and Child Health and Cardiothoracic Surgery

Presenter: TV Mokoena

Introduction: CIMT measurement has been used as a marker to establish the presence, risk and extent of cardiovascular disease. Several studies have validated the application of this imaging technique because it can detect slight changes associated with future cardiovascular events. Carotid intima medial thickness (CIMT) is a non-invasive tool used to detect atherosclerosis and diagnose cardiovascular disease. This study aimed to determine whether pre-operative CIMT measurements correlated with intra- and postoperative outcomes in patients with acute coronary syndrome (ACS) undergoing coronary artery bypass graft (CABG) surgery.

Methods: This retrospective analytical cohort included 89 patients diagnosed with ACS who received CABG surgery. Patients were divided into two cohorts: group 1 (normal CIMT <0.07cm) and Group 2 (abnormal CIMT ≥0.07cm). B-mode ultrasound was used to measure the CIMT in all patients. Pre-, intra- and post-operative data and complications were recorded for each patient.

Results: The study included 77 (86.5%) males and 12 (13.5%) females. Pre-operative mean body mass index (BMI) was significantly higher (p=0.03) in group 2 than in group 1. Group 2 had significantly increased diabetes (p=0.008), hypertension (p=0.009) and NT pro-BNP (p=0.02). Intra and postoperative outcomes between groups were comparable, with no significant differences.

Conclusion: The study showed no correlation between abnormal CIMT and increased adverse intra- and post-operative patient outcomes. Therefore, the results of this study show CIMT should not be considered a tool to predict adverse events in patients undergoing CABG surgery.

CR16

CORRELATION OF CARDIAC RISK FACTORS WITH CAROTID INTIMA-MEDIA THICKNESS AND RADIAL INTIMA-MEDIA THICKNESS MEASUREMENTS

Authors: FG van Schalkwyk, FE Smit, SC Brown and L Botes

Affiliation: Departments of Paediatrics and Child Health and Cardiothoracic Surgery

Presenter: FG van Schalkwyk

Introduction Early identification of patients at risk for future cardiovascular events is essential since addressing these early stages is more effective than treating advanced atherosclerotic vascular disease. The presence of multiple risk factors increases the development of atherosclerosis significantly. Two hundred and fifty first-time patients presenting with one or more modifiable risk factors at a private physician practice underwent a vascular ultrasound measuring the carotid intima-media thickness (CIMT) and radial intima-media thickness (RIMT).

Methods A prospective, descriptive-analytical single-centre study was conducted to investigate the possible relationship between carotid intimal media thickness (IMT), radial IMT and modifiable and non-modifiable cardiac risk factors. This study was conducted at a private physician practice in Bloemfontein. The study sample included 250 1st time-visiting patients.

Results Forty-two percent (n=104) of patients presented with three or more modifiable risk factors, thirty-nine percent (n=98) with two risk factors and nineteen percent (n=48) with one modifiable risk factor. Hypertension was the most common modifiable risk factor (89%) followed by obesity (66%). Male gender was associated with a significant increase in mean CIMT ($p< 0,01$). Hypertension, diabetes mellitus (DM), hypercholesterolemia and smoking contributed to a thickened CIMT mean with odds ratios of 3.99, 2.82, 2.47 and 2.09, respectively. Combinations associated with a thicker mean CIMT included hypertension and DM, hypertension and smoking - odds ratios of 6.92 and 3.67. The only risk factor that demonstrated a significant association with a thicker mean RIMT was hypercholesterolemia ($p<0.01$) and the combinations of hypertension and obesity, DM and obesity and hypertension and hypercholesterolemia ($p<0.05$).

Conclusion Male sex, increased age, hypertension, DM, hypercholesterolemia and smoking significantly contributed to a thickened CIMT, whereas only hypercholesterolemia was associated with a thickened RIMT. Among all risk factors, hypertension had the most significant impact on the CIMT mean compared to the other modifiable risk factors. Combinations of risk factors appeared to add summative risks for thickened CIMT and RIMT.

CR17

OUTCOMES OF SINGLE VENTRICLE PHYSIOLOGY IN CENTRAL SOUTH AFRICA

Authors: MJ van Jaarsveld, L Botes, FE Smit and SC Brown

Affiliation: Departments of Cardiology, Cardiothoracic Surgery and Paediatrics and Child Health

Presenter: MJ van Jaarsveld

Introduction: Single ventricle physiology is a critical cardiac condition requiring early diagnosis and intervention.

Objectives: To report on the management and outcomes of patients diagnosed with single ventricle physiology in Central South Africa.

Methods: A retrospective observational analysis of patients presenting with single ventricle physiology at the Universitas Academic Hospital (UAH) in Central South Africa between November 1997 and June 2021.

Results: Patients were referred from the Free State province (54%), Northern Cape (29%) and Lesotho. One hundred and fifty-four patients presented with single ventricle physiology: 114 received interventions, and 40 were not eligible for intervention. Patients presented for the first time at a median age of 34.5 days, with patients from nearby districts presenting within a few days of birth. However, patients from outlying areas presented much later. Eighty-seven patients received systemic to pulmonary artery shunting or pulmonary artery banding. Sixty-three patients proceeded to bidirectional Glenn procedures, and 30 patients (26%) had full palliation to Fontan. Twenty-one patients demised after stage 1, six after the Glenn procedure and two after the Fontan procedure. Overall, 34 (29.8%) patients were lost to follow-up.

Conclusion: Patients in our study presented late, and follow-up of these patients was a challenge. The highest mortality occurs during the first stage of palliation. Outcomes from this study are comparable to other Sub-Saharan studies.

CR21

THE ASSOCIATION BETWEEN THE PREVALENCE OF HIV INFECTION AND ECTOPIC PREGNANCY

Authors: MM Mohosho

Affiliation: Department of Basic Medical Sciences

Presenter: MM Mohosho

Introduction: Women infected with the human immunodeficient virus have a higher risk of pelvic inflammatory disease, which could lead to development of ectopic pregnancy due to fallopian tubal pathology. Due to short pregnancy period, women with ectopic pregnancy unlikely complete the antenatal screening, which includes HIV tests. Therefore, it is postulated that unscreened HIV infection prevalence in women with ectopic pregnancy diagnosis could be significantly higher than in women with normal intrauterine pregnancy (IUP).

Methods and Aim: The aim of the present retrospective cross-sectional study was to determine the association between ectopic pregnancy and HIV infection in KwaZulu Natal Province hospital setting, between 2016 and 2017. 5427 pregnant women with normal pregnancies formed the intrauterine pregnancy (IUP) cohort, while 83 patients were part of the ectopic pregnancy cohort.

Results: The statistical HIV prevalence was significantly higher in the ectopic pregnancy cohort (56.63% vs 39.4%, P-value of 0.001). In addition, HIV prevalence in the ectopic pregnancy cohort was analyzed per age group, and it was found to be higher in the 25-34 years age group (88.3%) than the 16-24 (43.3%) and 35-42 (60%) years age groups.

Conclusion: This study highlights the significance of conducting a full antenatal screening programme in patients who present with ectopic pregnancy, to improve the rate of HIV infection testing and treatment in women who present with ectopic pregnancy

CR22

MATERNAL FOLATE, VITAMIN B12 LEVELS AND NEURAL TUBE DEFECTS AT UNIVERSITAS-PELONOMI ACADEMIC COMPLEX IN MANGAUNG

Authors: GCR Maphiri, SM Baloyi, O Gavi and M Nel

Affiliation: Departments of Obstetrics and Gynaecology and Biostatistics

Presenter: GCR Maphiri

Background: Neural tube defects (NTDs) are congenital malformations of the central nervous system which are due to defective primary and/or secondary neurulation; they are the second most common congenital structural defects after heart anomalies. The subtypes are isolated or syndromic and either type can cause significant morbidities or mortalities, thereby worsening the strain on the already overburdened health system.

Objectives: To determine if maternal red cell folate and vitamin B12 deficiency are associated with the development of NTDs locally, what other possible local aetiological factors are, and whether folic acid food fortification has been successful in reducing NTDs due to folate deficiency.

Methods: A prospective case-control, qualitative study was conducted from 2020-2023, whereby 102 pregnant patients were enrolled. Half (51) were carrying affected foetuses, and half (51) were controls. Questionnaires with close-ended questions were used to collect demographic and medical data to determine the risks of NTDs in our study groups; subsequently, Vitamin B12 and folate levels were measured from maternal blood of both cases and controls.

Results: Maternal folate levels were either replete or normal (48/102, 47.0% and 54/102, 53.0%, respectively); no patients had low levels. Vitamin B12 levels were high in two (2/102, 2%) patients, normal in most (86/102, 84.3%), and low in the remainder (14/102, 13.7%). There were no statistically significant associations between vitamin B12, folic acid and NTDs. Most cases were from Bloemfontein (34/102, 33.3%) and Welkom (28/102, 27.5%), suggesting a possible role of environmental factors in the pathogenesis.

Conclusion: The study indicates that the aetiology of NTDs in our context is multifactorial; we further concluded that the folic acid food fortification program has successfully normalised folate levels in women of child bearing age. Deficiencies of vitamin B12 and folate were ruled out as a cause of NTDs, however a quarter of the cases were from Welkom, which is a mining area. A follow-up study to investigate possibility of environmental factors could be beneficial.

CR23

POPULATION-BASED RISK FACTORS IN THE EPIDEMIOLOGY OF CONGENITAL ANOMALIES IN A SOUTH AFRICAN ACADEMIC HOSPITAL

Authors: MTS Herbst

Affiliation: Department of Surgery

Presenter: MTS Herbst

Introduction and aim: Congenital anomalies constitute a significant proportion of the global disease burden and are one of the leading causes of non-communicable diseases under five. This study aimed to illustrate the general maternal risk factors for offspring with congenital anomalies as well as those associated with specific congenital anomalies, in Universitas Academic Hospital (UAH), Bloemfontein, Free State, South Africa.

Methods: We performed a retrospective, descriptive, cross-sectional study using convenient sampling from patient admission and discharge statistics from 2005 to 2019. The included anomalies were oesophageal atresia with or without an associated trachea-oesophageal fistula, congenital diaphragmatic hernia (including cases of diaphragmatic eventration), intestinal atresia, malrotation with or without midgut volvulus, gastroschisis, omphalocele, Hirschsprung's disease, and anorectal malformation. Using the Chi-squared formula or Fischer's exact test, we did a categorical analysis to describe the data.

Results: There were 602 cases included and 924 congenital anomalies recorded. Maternal factors, irrespective of congenital anomaly illustrated that 26 to 35-year-old mothers were more likely to have offspring with congenital anomalies. Concerning maternal factors and congenital anomalies, maternal age, plurality, and ethnicity influenced the risk for offspring with congenital anomalies.

Conclusion: Congenital anomalies admitted to UAH are increasing. The data illustrates that different epidemiological factors influence these congenital anomalies in our setting compared to those in the literature.

CR24

THE PREVALENCE OF PREOPERATIVE ANAEMIA IN WOMEN UNDERGOING CAESAREAN SECTIONS AT PELONOMI HOSPITAL

Authors: S Skweyiya, O Thole, N Mhlanga, T Maphumla, P Phooko, D Mahoko, T Letsoara, L Masango and J Lemmer-Malherbe

Affiliation: Department of Anaesthesiology

Presenter: J Lemmer-Malherbe

Introduction: Anaemia is common in pregnancy, with iron deficiency being the most common cause. Anaemia has been associated with a higher frequency of labour induction, caesarean sections, blood transfusions and even death. The highest prevalence of anaemia was reported amongst pregnant women in developing countries, yet research on this matter has mostly been in high income countries. In South Africa, poor nutrition, chronic infections (for example, HIV) and limited access to proper healthcare all contribute to maternal healthcare. Practitioners must be aware of the burden of Iron Deficiency Anaemia. Therefore, active research to determine the prevalence of anaemia in women undergoing caesarean sections in vulnerable populations such as the areas surrounding Pelonomi Hospital and additionally, analysing the size of the red blood cells of the anaemic patients to gain more insight into the likely aetiology can yield better outcomes for patients and our healthcare system.

Methods: We performed a retrospective cross-sectional analytical study of all adult women who had caesarean sections within a 6-month period (1 April 2022 to 30 September 2022) at Pelonomi Hospital. Upon consultation of the World Health Organization guidelines, we classified patients into the three types of anaemia, namely mild, moderate and severe. By analysing the Mean Corpuscular Volume (MCV) of all the anaemic patients, we categorized the anaemia as being microcytic, normocytic or macrocytic.

Results: The prevalence of preoperative anaemia in pregnant women who underwent Caesarean sections at Pelonomi Hospital was 118 (17.6%). Of the 670 patients included in the study, 3 /670 (0.4%) had severe anaemia, 48/670 (7.2%) had moderate anaemia and 67/670 (10%) had mild anaemia. Upon analysis of the mean corpuscular volume, the anaemia was normocytic in 76.3% of patients, microcytic in 14.9% and macrocytic in 8,8%.

Conclusion: Preoperative anaemia in pregnant women is less common in Pelonomi hospital than in other parts of the world. The anaemia was mainly mild and moderate; thus, a blood transfusion can be avoided by identifying and treating the cause timeously. Normocytic anaemia was the most prominent, which makes iron deficiency a less probable cause in this population.

EP01

TEACHING STRATEGIES FOR CRITICAL THINKING IN THE UNDERGRADUATE STUDENTS OF THE SCHOOL OF HEALTH AND REHABILITATION SCIENCES AT THE UNIVERSITY OF THE FREE STATE

Authors: M Louw and C Van Wyk

Affiliation: Departments of Physiotherapy and Occupational Therapy

Presenter: M Louw

Introduction and aim: The fourth industrial revolution and the new generation of students have pushed lecturers to adjust teaching strategies, to ensure the facilitation of learning and student success. The inclusion of critical thinking (CT) skills in these teaching strategies are essential to ensure the development of problem-solving skills and to provide the best patient care. The aim of this study was to investigate the teaching strategies lecturers use to develop CT skills in undergraduate students and to determine how the different teaching strategies are implemented in the different year groups.

Methodology: Lecturers in four of the departments (Physiotherapy, Occupational Therapy, Nutrition and Dietetics, and Optometry) of the School for Health and Rehabilitation Sciences at the University of the Free State completed a self-designed questionnaire, to determine which strategies they used to develop students' CT skills and then indicate on a Likert scale how frequently they use the strategy in the different year groups. A descriptive design was used to investigate the different types of teaching strategies used in the different year groups over the timeframe of one year. The data from the questionnaires was transformed into numerical code and reported as frequencies (medians) and percentages.

Results: A response rate of 60% (n=24) of the target population was achieved. Lecturers indicated problem-based learning and experiential learning as the teaching strategies applied most often to develop CT skills.

Conclusion: The study found that CT teaching strategies are embedded in the curriculum ("holistic approach") and are mostly scaffolded during the curriculum by lecturers. More research is needed to determine if students are allowed sufficient time to master the CT skills before moving on to more complex CT teaching strategies and how to scaffold the CT skills into the teaching strategies to increase the effectiveness of CT skills development.

EP02

USABILITY OF STANDARDS FOR SCAFFOLDING IN A HEALTH SCIENCES PROGRAMME: A FEASIBILITY STUDY

Authors: B Masava, CN Nyoni and Y Botma

Affiliation: School of Nursing

Presenter: B Masava

Introduction and aim: Standards can result in comprehensive and programmatic implementation of educational strategies, such as scaffolding. Although educational standards development is through a rigorous consensus approach, they are socially constructed, and could result in varied interpretations by users. Reports of varied implementation of standards in health professions education underscores the need to test the developed standards for scaffolding. Usability is about determining whether a product like standards works as intended under the expected conditions and contexts. The aim of this study was to describe the usability of standards for scaffolding in a health sciences programme through a pilot study.

Methodology: A multi-method design employing user and expert-based usability evaluation techniques sought to describe the usability of the standards for scaffolding in a three-year pre-registration nursing programme. Three panel members with an understanding of the discipline and programme context were purposively sampled. The users conducted a self-assessment on scaffolding practices in the programme using standards' checklist. The panelists studied users' self-assessment report before completing an author-generated heuristics checklist to support or refute any of the standards/criteria. Descriptive statistics, comparative and content analysis were applied to analyse data from users' interviews and heuristics checklist, determining the standards' usability, and identifying the usability flaws or strengths.

Results: The four standards were usable with a usability score of above average (60%). Seven usability strengths and four usability flaws were identified. Usability flaws were on misinterpretation of some criteria statements/terminologies, multiple meanings, and users' challenges in generating evidence for some criteria.

Conclusion: The pilot revealed the context-based 'truth' regarding the fidelity of using the standards to evaluate scaffolding practices in a health sciences programme. The standards directed and supported the design and implementation of scaffolding practices. The identified usability flaws highlighted the need for further revisions and future research on the standards.

EP03

PROGRESSION FROM SURGICAL MEDICAL OFFICER TO SURGICAL REGISTRAR: EXPERIENCES AND BARRIERS

Authors: D Rutledge, N Ahmed and SM Le Grange

Affiliation: Department of Surgery

Presenter: D Rutledge

Introduction: Ninety percent of the population in LMICs do not have access to basic surgical care. This is also true for South Africa, with the specialist workforce density being far below what is required to deliver safe and timely surgical care. We also have an unequal divide between available services in the public and private health sectors. This study aims to quantify the interest in surgical careers among post-community service medical officers, to determine the interest in remaining in the public sector and to identify the perceived obstacles in obtaining surgical registrar posts.

Method: The population studied were medical officers working in surgical disciplines at 10 Northern- and Western Cape hospitals. A questionnaire containing the following questions: age, gender, race, current hospital and department, interest to specialise in a surgical discipline, the specific surgical discipline of interest, CMSA-examinations already written, already applied for a registrar posts, already interviewed for registrar posts, obstacles faced in the process of obtaining a registrar post, and intention to remain in state practice after specialising were distributed electronically.

Results: Seventy responses were received. Sixty-eight (97,1 %) plan to specialise in a surgical discipline. A total of 76,5 % (52/68) of respondents who plan to specialise thought the main obstacle to obtain a registrar post is the abundance of applicants compared to available posts, while 14,7 % (10/68) thought they didn't meet the minimum requirements and 7,3 % (5/68) thought they didn't have enough surgical experience as a medical officer. Sixty comma three percent (41/68) of respondents who plan to specialise in a surgical field plan to stay in the public sector, while 35.5% (24/68) will consider it and 4.4% (3/68) aren't interested. No statistically significant correlation was found between examinations written and being shortlisted for interviews (p=0.71).

Conclusion: This study found a significant interest in specialising in surgical disciplines among medical officers. It also found a good interest in remaining in the public sector after specialisation. The majority thought there are not enough training posts available. A need to do more research regarding the supply and demand of surgical registrar posts in the various centres were identified.

EP04

EXPLORATORY FACTOR ANALYSIS OF THE MOULAGE AUTHENTICITY RATING SCALE AND PROPOSED ADAPTATIONS

Authors: C Fourie and Y Botma

Affiliation: School of Nursing

Presenter: C Fourie

Introduction: Moulage plays an important part in enhancing the fidelity of simulation scenarios and motivating students to engage in learning opportunities. There is limited literature on the importance of moulage and its role in enhancing fidelity of simulation based learning experiences. In 2019, Stokes-Parish and colleagues developed the Moulage Authenticity Rating Scale (MARS) to determine moulage's physical and conceptual fidelity. For moulage to be high in fidelity it needs to also contribute to emotional fidelity. Although the MARS tool was proven to be reliable and valid in the context it was developed, the authors validated the psychometric properties in a different context.

Methods and materials: Two open-ended questions were added to the MARS to explore the emotional responses of respondents to the moulage. Eighty-five third-year undergraduate nursing students at a higher education institution in South Africa completed the MARS after a burns simulated learning experience. A biostatistician calculated the Cronbach alpha coefficient and did an Exploratory Factor Analysis (EFA).

Results: The tool was proven reliable, as the Cronbach alpha (α=0.87) for all 13 questions correlated with the findings (α=0.93) of Stokes-Parish et al. However, the exploratory factor analysis did not confirm the construct validity of the MARS. Inductive analysis of the textual data indicated that the moulage stimulated various senses with subsequent emotional responses.

Conclusion: Moulage contributes to physical fidelity, triggers emotional responses, and may be a clue that enhances conceptual fidelity. The MARS tool needs to be adapted. Further research is required to determine the psychometric properties of the suggested adapted MARS included in this article.

ER01

STANDARDS FOR SCAFFOLDING IN HEALTH SCIENCES EDUCATIONAL PROGRAMMES: A GLOBAL CONSENSUS STUDY

Authors: B Masava, CN Nyoni and Y Botma

Affiliation: School of Nursing

Presenter: B Masava

Introduction and aim: Health sciences programmes operate in complex, unpredictable contexts, underscoring the need for scaffolding of the learning processes. Yet, the scaffolding approaches remain fragmented, and lacks a shared approach of how programmes could maximally benefit from integrated scaffolding. The literature argues that standards result in comprehensive implementation of educational practices. Standards have the potential to promote programmatic scaffolding practices and to evaluate scaffolding in the programmes. There are no reported standards related to scaffolding practices in these programmes. The aim of this study was to develop standards for scaffolding in health sciences educational programmes through global consensus.

Methodology: An online modified Delphi technique, following the recommendations on Conducting and REporting of DElphi Studies (CREDES), was applied. An international panel, drawn from diverse geographical and professional backgrounds using purposive and snowball sampling, refined draft standards. Descriptive statistics was utilised to analyse demographic data and consensus agreements for the inclusion of standards and criteria. Qualitative analysis of textual comments ensured the synthesis and inclusion of critical divergent views and additions.

Results: A total of 22 experts drawn from around the globe agreed to participate in the study. Eighteen experts held a PhD; and an average of 19 years' experience in health sciences education. Four standards and 27 criteria were included after achieving consensus during the two Delphi surveys rounds. The standards focused on areas such as structuring and sequencing educational activities, resources/tools for scaffolding, structuring the programme, and instructional strategies that support learning.

Conclusion: The principle-based standards developed in this study could direct, support and evaluate scaffolding practices in health sciences programmes. The standards' emphasis on macro-, meso- and micro-scaffolding, present numerous opportunities for design and application of contextually sensitive scaffolding strategies at every level of curriculum implementation.

ER02

DOCTORAL CONTRIBUTION TO NURSING SCIENCE IN SUB-SAHARAN AFRICA: A DOCUMENT REVIEW

Authors: CN Nyoni, L Hugo-van Dyk and Y Botma

Affiliation: School of Nursing

Presenter: CN Nyoni

Introduction: Nursing science is at a serious risk of extinction. The lack of funding for research, the absence of health care policies underpinned by nursing science and the general lack of understanding of the nursing meta-paradigms all contribute to the stunted growth in nursing science. Doctoral research is a platform for the development and refinement of nursing science. The purpose of this review was to describe the doctoral contribution to nursing in sub-Saharan Africa.

Methodology. A qualitative retrospective document review was applied. Electronic dissertations for doctoral degrees in nursing within a five-year period from universities in sub-Saharan Africa were included. The extracted data comprising the purpose of the studies, the models used in the studies, and the studies' contributions to nursing science were analysed against a knowledge contribution framework.

Results: 166 documents were included mostly from South African universities with a predominant focus on developing models, frameworks, and strategies within nursing practice. Only 17% of the included studies applied grand nursing theories or models with the rest of the studies applying theories from other disciplines. The contribution to nursing science from the doctoral studies in the included time frame was poor.

Conclusion: The low uptake of nursing models in doctoral research in SSA may significantly contribute to the lack of refinement of nursing science within SSA. Structured approaches focused on integrating the nursing meta-paradigms, theories, and models and fundamental underpins for doctoral education in Africa are essential to influencing the refinement of nursing science.

ER03

IMPROVING TIME-TO-DEGREE THROUGH ADAPTED POSTGRADUATE STUDENT SUPPORT INITIATIVES: AN INITIAL EVALUATION OF POSTGRADUATE PROGRESSION IN SELECTED HEALTH SCIENCES RESEARCH STUDENTS AT A SOUTH AFRICAN UNIVERSITY

Authors: R Smith and C Janse van Vuuren

Affiliation: Department of Phyiotherapy

Presenter: R Smith

Support strategies for postgraduate students are important to improve the time-to-degree. South African literature on the specific nature of postgraduate support strategies and their impact are scarce. This study aims to provide an initial evaluation of postgraduate support initiatives implemented in a South African university for health sciences students, with a specific focus on student progression between pivotal milestones. The descriptive study included 48 postgraduate students first registering between 2018 and 2021. A comparative analysis of quantitative progression data was done for the 2018/2019 (pre-intervention) and 2020/2021 (post-intervention) groups. The sample included 37 master's degree and 11 doctoral degree students. The initial evaluation of the postgraduate student support initiative implemented shows promising results on the progression of postgraduate students between pivotal milestones when utilising an integrated approach to student support. Further evaluation of the progress of these cohorts until graduation is recommended to further substantiate findings from the initial evaluation.

ER04

IS A SAFE LEARNING ENVIRONMENT AN ILLUSION?

Authors: E Kempen, MJ Labuschagne and MP Jama

Affiliation: Division Health Sciences Education, Clinical Simulation and Skills Unit

Presenter: E Kempen

Introduction and aim: Evidence suggests that any learning experience should happen in a safe learning environment as students will interact, experiment and construct new knowledge. However, more information about the elements is required to create a safe learning environment for millennials, especially in optometry education. This study aimed to identify the factors contributing to a safe learning environment for millennial optometry students.

Methodology: An intrinsic qualitative case study was undertaken with undergraduate students from the Department of Optometry at the University of the Free State, South Africa. An open-ended questionnaire was completed after applying nine different teaching-learning methods based on the experiential learning cycle. A total number of 307 questionnaires were analysed. Two focus group interviews were also conducted to provide additional data to supplement the data and ensure the triangulation of data.

Results: Important elements based on student respondents' opinions, feelings and perceptions were analysed. Students feel safe in a familiar environment where they are familiar with each other, the educators, and the surroundings. Small-group learning also creates a safe and familiar environment. Both these elements create an environment where they feel safe to ask questions. Students value an environment where they can learn without influencing their marks or disadvantaging the patients. They enjoy learning from their peers but also need personal contact with educators. Elements such as consistency and an achievable objective were also analysed.

Conclusion: The findings suggest that to respond to the real need of this generation of students, insight must be gained into students' perceptions to identify their needs. These personalised elements should be carefully applied to enable optometry students to take responsibility and be accountable for their learning.

ER05

COPING STRATEGIES OF UNDERGRADUATE STUDENTS IN HEALTH SCIENCES: A SCOPING REVIEW

Authors: T Kataza and L Hugo-Van Dyk

Affiliation: School of Nursing

Presenter: T Kataza

Introduction and aim: Students enrolled at higher education institutions experience immense stress, which may result in high dropout rates and negative coping strategies. Health sciences students face additional stressors as they must complete a high number of work-integrated learning hours where they are directly responsible for patients' care, apart from their loaded academic schedule. Students need support and adaptive coping strategies to manage stressors and transfer learning. Available literature can provide insight into such coping strategies to support students optimally. This study aimed to explore the existing knowledge on the coping strategies of undergraduate students in health sciences programmes.

Methodology: A nine-step scoping review framework was used to conduct this scoping review. Thirteen databases rendered 1432 records from January 1990. Using inclusion and exclusion criteria, the researchers screened 834 records after deduplication and finally included 156 articles in the study.

Results: There is a dearth of literature on coping strategies in the African context and on other health sciences professions including dentistry, dietetics, sport and exercise science, occupational therapy, optometry, paramedicine, pharmacy, physiotherapy and radiography. Many studies were descriptive and conducted as single-site studies. Most articles did not report on the sampling techniques. Only nine studies reported on theoretical underpinnings, models, and frameworks. Academic stressors are the most reported stressor, followed by psychosocial stressors. Students mainly used emotion-focused coping strategies to cope with stressors.

Conclusion: Health Sciences Education Institutions must develop support strategies to assist their students to cope effectively in a evolving academic and clinical environment. There is a need for further research on the coping of undergraduate students in health sciences, focusing on all healthcare professions implementing such strategies. Suggestions to train nurse educators and clinical facilitators on providing adequate support for students to cope efficiently are among the recommendations of this study.

ER06

ASSOCIATIONS OF FOOD INSECURITY WITH BIOGRAPHICAL PROFILE AND ACADEMIC PERFORMANCE AT THE UFS

Authors: L van den Berg, N Mabena, M Nel and L Robb

Affiliation: Departments of Nutrition and Dietetics and Biostatistics

Presenter: L van den Berg

Introduction: Globally. student food insecurity has become a well-recognised threat to academic success in higher education, but the issue remains under researched in the South African context. This study assessed the prevalence of food insecurity among students at the University of the Free State (UFS) and the associations with their biographical profiles and academic performance.

Methods: A cross-sectional online survey, conducted at the UFS in 2020 before Covid-lockdown, used the validated AFSSM to assess food security. In total, 1389 respondents met the inclusion criteria; 955 were senior students who gave informed consent for their general performance averages (GPA) for November 2019, obtained from institutional data to be used in the study.

Results: The AFSSM identified 74.9% (95% confidence interval [72.7%; 77.2%]) of respondents as food insecure: 23.5% with low food security, 51.5% with very low food security; and 6.2% reported skipping meals for a whole day at least every month for lack of money. GPA were significantly associated with food security level (p=0.0001). Regression analysis showed that food secure respondents were 4.3 times more likely to successfully progress to the next academic year than food-insecure respondents. Thematic analysis of open-ended survey questions regarding using the university food pantry and food bursary scheme revealed fear of stigmatisation, relying on each other for food assistance, and using government financial aid to assist struggling families at home.

Conclusions: Current interventions to address student food insecurity at South African universities focus almost exclusively on at relieving acute hunger in the most severely affected students through food banks or financial aid. These necessary interventions, cannot be upscaled and sustained to meet the scope of food insecurity identified at South African universities. A national food security surveillance system for higher education would allow government and institutions to interact more effectively to identify and address underlying causes.

ER07

THE NON-COGNITIVE ATTRIBUTES OF UNDERGRADUATE NURSING STUDENTS: A SURVEY AT A SOUTH AFRICAN UNIVERSITY

Authors: MB Setlogelo and CN Nyoni

Affiliation: School of Nursing

Presenter: MB Setlogelo

Background: Nursing education programmes have become more complex and unpredictable. The difference between the planned curriculum and what students experience is widening. Technological advancements, epidemiological transitions and the emergence of new diseases which are part of a dynamic healthcare climate mean that the programmes that students enrol for may not necessarily be what they experience. As educators innovate their curriculum to accommodate changes in healthcare, students are expected to successfully adapt to these innovations. Self-directedness, an outcome of the association between cognitive and non-cognitive attributes in academic performance, is a crucial variable in the successful adaptation to educational changes. Academic resilience, grit and mindset are essential non-cognitive attributes that students must poses to adapt to change and become self-directed. This study sought to describe the non-cognitive attributes of undergraduate nursing students

Methods: A quantitative descriptive cross-sectional design on 315 undergraduate nursing students at the School of Nursing. Data were collected using self-administered questionnaires that included demographic data, the 30-item Academic Resilience Scale (ARS-30); the 16-item Dweck Mindset Scale (DMI) and 8-item scale. The collected quantitative data were analysed statistically through the Statistical Analysis Software Version 9.4 computer programme.

Results: Students had low academic resilience, grit, and growth mindset, highlighting the importance of development and maintenance of these non-cognitive qualities in higher education.

Conclusions: Little is known about non-cognitive attributes of undergraduate nursing students in low-resource settings. Educational innovations supporting programme adaptation to the dynamic healthcare environment must integrate strategies to modify non-cognitive attributes of the undergraduate students to enhance self-directedness and alignment of changes in their educational programmes.

ER08

HIGH-TECHNOLOGY CLINICAL SIMULATION OPERATIONAL CHALLENGES: A SOUTH AFRICAN APPROACH

Authors: R Van Wyk, MJ Labuschagne and G Joubert

Affiliation: Clinical Simulation and Skills Unit

Presenter: R Van Wyk

Introduction Technical, logistical, cost, and technical support have been identified as challenges of high-technology clinical simulation. Due to the specific South African training platform, case mix and resources, the local operational approaches and challenges may differ from those established in developed countries. This study determined the current operational challenges of clinical simulation facilities in South Africa regarding the use of high-technology clinical simulation and formulated an approach to mitigate these challenges.

Methods A quantitative descriptive study was performed using a multi-method approach. Data regarding challenges were collected using an online web questionnaire with representatives of public, South African simulation facilities. An electronic Delphi survey was also conducted with eight simulation experts to determine best practice approaches to identified challenges.

Results Forty-two health professions training institutions representing 12 health professions were identified and approached for the survey. The questionnaire was completed for 17 facilities, of which 14 utilised high-technology simulation. The challenges faced by the facilities are typically the challenges described in the literature. From the Delphi survey, four hundred and one statements emerged regarding best practice approaches to identified challenges. Consensus was reached in 230 (57.4%) statements. Guidelines were drafted to illustrate how the recommendations could be achieved.

Conclusion Six operational areas were identified, management, funding, staffing and staff development, curriculum integration, physical spaces and research. These areas do not stand in isolation from each other but are integrated. A gap in the performance of one area might be traced back to a task not done in another area. To address the identified challenges, recommendations and guidelines on a best practice approach were given across these areas. Understanding the integration of the operational areas could lead to successfully mitigating challenges faced by a simulation facility.

ER09

HIGH-FIDELITY MOULAGE MAKES SIMULATIONS "COME ALIVE"

Authors: C Fourie and Y Botma

Affiliation: School of Nursing

Presenter: C Fourie

Introduction: The simulation community knows that immersive clinical simulation works, especially high-fidelity simulations that portray situations as close as possible to real-life. The question remains: what is the role of moulage in the effectiveness of this strategy?

Method: This article describes students' perceived fidelity of the moulage used during a burns simulation activity. In a multi-method descriptive study, 85 nursing students completed the 13-item Moulage Authenticity Rating Scale (MARS) and responded to two open-ended questions that explored emotional fidelity.

Results: Most respondents rated the moulage burns to be high in fidelity. Respondents' senses of sight, touch, hearing, and smell were triggered giving way to intense emotions. However, sensory overload may have led to the students missing clinical cues.

Conclusion: The moulage met the criteria for physical, cognitive, and emotional fidelity, contributing to students' engagement during the simulation activity. Educators could improve student engagement by enhancing the fidelity of simulation activities through moulage with due consideration to the cognitive load.

ER10

AN INSTRUMENT TO MEASURE THE COMPETENCIES OF RESPECTFUL MATERNITY CARE

Authors: L Bester and L Hugo-Van Dyk

Affiliation: School of Nursing

Presenter: L Bester

Introduction and aim: Despite respectful maternity care (RMC) being an essential component of quality maternity care, disrespectful maternity care still occurs globally. A theory-practice gap exists on RMC being taught to health sciences students and what is being role modelled by skilled birth attendants in clinical practice. Therefore, affirming RMC in skilled birth attendants and students in practice is needed to strengthen RMC. No instrument could be found that can measure RMC in skill birth attendants or students. An instrument measuring the competency of RMC can verify whether skill birth attendants and/or students are deemed competent in rendering RMC. The aim of this study was to develop an instrument to measure the knowledge, skills and behaviour of RMC in skill birth attendants.

Methodology: A quantitative methodological research design was used to develop the instrument. A literature search was done to identify RMC elements related to knowledge, skills, and behaviour to formulate measurable RMC items. Forty-four items were included in the initial instrument. An online Delphi technique with experts confirmed face and content validity of the developed instrument via Evasys®.

Results: Consensus on the items was reached after two rounds. Experts agreed that all 44 items on the skill birth attendants'' knowledge, skills, and behaviour regarding RMC should be included in the RMC competency measuring instrument. No new items emerged from the Delphi rounds.

Conclusion: Respectful maternity care is vital for a positive birth experience. The RMC competency measuring instrument can be used to measure RMC competence in skill birth attendants. The results of this instrument may be used for the training of students and continues professional development of skill birth attendants. Further psychometric testing of the instrument is needed to refine the instrument.

ER11

THE ABILITY OF TEACHERS TO IDENTIFY GRADE 1 LEARNERS IN LOW SOCIO-ECONOMIC ENVIRONMENTS WITH POSSIBLE DEVELOPMENTAL COORDINATION DISORDER

Authors: AM du Plessis, M de Milander, FF Coetzee and M Nel

Affiliation: Department of Exercise and Sport Sciences

Presenter: M de Milander

Introduction and aim: Early identification of learners in low socio-economic environments with possible developmental coordination disorder (DCD) is important. Although various screening tools are available, it is unclear whether teachers can use the movement assessment battery for children - second edition checklist (MABC-2 checklist) to identify learners with possible DCD. The aim was to establish teachers' ability to identify Grade 1 learners in low socio-economic environments with possible DCD.

Methods: The study was conducted in the Mangaung Metro, Motheo District of the Free State Province, South Africa. Grade 1 learners aged 6-8 years (n = 200) from a low socio-economic environment attending quintile one to three schools were randomly selected for assessment. Twenty-nine teachers participated in the study. Kinderkineticists identified learners with possible DCD (displaying motor skills far below the child's age) by means of the MABC-2 performance test. The teachers used the MABC-2 checklist to identify possible DCD. The convergent validity of the MABC-2 performance test and checklist was compared.

Results: The convergent validity between the MABC-2 performance test and the MABC-2 checklist indicated a kappa (k) coefficient of 0.17, indicating a slight agreement between the performance test and the checklist. Overall, the specificity was 58% (105/180), and the sensitivity was 85% (17/20).

Conclusion: Teachers could effectively identify learners with possible DCD. However, they demonstrated a low ability to identify learners without possible DCD when using the MABC-2 checklist. It is therefore recommended that the performance test should be used in conjunction with the checklist to obtain the most reliable results.

LP01

EFFECT OF RECEIVING MOBILE TEXT MESSAGES ON CORTISOL CONCENTRATIONS IN STUDENTS AT THE UNIVERSITY OF THE FREE STATE

Authors: R Vorster-de Wet, AM Gerber and JE Raubenheimer

Affiliation: Departments of Basic Medical Sciences and Biostatistics

Presenter: R Vorster-de Wet

Introduction and aim: Texting has become central to social life, with adverse effects on physiological functioning. Research into the impact of texting on cortisol secretion is limited. To determine how receiving mobile text messages affected salivary cortisol concentrations, and investigate the moderating effects of stress, anxiety and depression on cortisol secretion.

Methodology: The study was an experimental, crossover, quantitative study over six months in registered undergraduate physiology students from the Faculty of Natural and Agricultural Sciences, University of the Free State (UFS). Participants were involved over two consecutive days, receiving mobile text messages (intervention) on one day and acting as their own control on the other. Self-reported data on stress, anxiety, depression and subjective experience of the study, and saliva samples were collected. Text frequency and wording (neutral, positive, negative) were varied among participants.

Results: Forty-eight students participated in the study. Salivary cortisol concentrations did not differ significantly between the intervention and control days. High anxiety levels were associated with increased cortisol concentrations. No associations with cortisol concentrations were documented in low to moderate anxiety, stress, depression or how participants experienced the intervention. There were no significant differences between text frequency, text emotion and change in cortisol concentrations on the intervention day.

Conclusion: Receiving mobile text messages did not elicit a significant cortisol response in participants. Findings added to the body of knowledge about the effect of texting on student learning by measuring salivary cortisol concentrations in a lecture setting, with an investigation into the moderating effects of stress, anxiety, depression and participants' subjective experience.

LP02

SHAKEN OR STIRRED? THE EFFECT OF PHYSICAL AGITATION ON THE HOMOGENEITY OF PHARMA Q® BUPIVACAINE 0.5% WITH DEXTROSE 8% SOLUTION

Authors: PM Van der Linde, G Lamacraft, HL Du Preez and NF Hiten

Affiliation: Department of Anaesthesiology

Presenter: PM Van der Linde

Introduction and aim: There are various opinions as to whether an ampoule of bupivacaine with dextrose should be shaken before injecting intrathecally for spinal anaesthesia, although no supportive literature exists. In 1985, Greene described 25 factors that can influence the distribution of local anaesthetic in the spinal canal but, did not include shaking the ampoule. A 2020 Twitter opinion poll, by "@DrGetafix" demonstrated conflicting thoughts on this matter, showing the need to scientifically investigate this controversy. The aim was to assess whether agitation of a 4 ml ampoule containing 0.5% bupivacaine with dextrose 8% effects the homogeneity of the contents.

Methodology: This was a double randomised, controlled, triple-blinded single centre laboratory study. One hundred ampoules of bupivacaine 0.5% with dextrose 8% 4 ml, manufactured by Pharma Q® were randomised into 5 groups (A, B, C, D, and E). These were kept upright and without motion for 131 to 140 days. The 5 groups were then randomised again to receive an intervention related to movement: Mild agitation, Moderate agitation, Severe agitation, Centrifugation or None (Control). Main outcome measures: Samples from the top and bottom of the ampoules were taken immediately after the intervention. The concentrations (measured as peak area ratios) of bupivacaine and dextrose and the density of these fluid samples were measured (primary outcome). The results from the top and bottom of each ampoule were compared (secondary outcome).

Results: Variation within the different groups were seen in bupivacaine, dextrose, and density measurements. A haphazard pattern was seen regarding the effect of agitation.

Conclusions: No conclusion can be reached from this study as to whether the bupivacaine/dextrose ampoules need to be shaken to ensure homogeneity. Further studies are needed to investigate the disparity of the results found in this study.

LP03

THE ANTIPROLIFERATIVE EFFECT OF MORINGA OLEIFERA AQUEOUS LEAF EXTRACT IN MCF-7 BREAST CANCER CELLS

Authors: MM Moremane, BA Abrahams and C Tiloke

Affiliation: Department of Basic Medical Science

Presenter: MM Moremane

Introduction and aim: Breast cancer is associated with an increase in mortality and morbidity rates in women across the world. Current chemotherapeutic drugs such as Doxorubicin (Dox) display dose-dependent contra-indications such as cardiomyopathy, expressing the need for alternative treatment methods. Moringa oleifera (MO), a medicinal tree native to India and indigenous to Africa has therapeutic potential as an anti-cancer agent. MO has been previously shown to be an antioxidant as well as an inducer of cancer cell death. Therefore, the aim was to investigate whether an aqueous leaf extract of MO, displays antiproliferative properties in MCF-7 breast cancer cells.

Methodology: Biochemical analysis was conducted: methyl thiazoltetrazolium (MTT) assay assessed cell viability, glutathione (GSH) assay quantified GSH levels, dichloro-dihydro-fluorescein diacetate (DCFH-DA) assay measured reactive oxygen species (ROS), and caspase activity assay was conducted to assess apoptosis. In addition, adenosine triphosphate (ATP) assay as a measure of metabolic activity, as well as western blotting (protein expression).

Results: MO and Dox significantly reduced the proliferation of breast cancer cells at 72hrs and an IC50 of 2600µg/ml and 0.978µM, respectively, was determined and used in subsequent assays. MO increased ROS whilst decreasing glutathione and Nrf2 protein levels. In contrast, MO + Dox upregulated the expression of Nrf2, thereby repairing oxidative damage Additionally, MO induced apoptosis by increasing caspase -3/7, -8/9, ATP but decreased the Bcl-2 and Bax protein levels. The same effect was observed in the combination of MO + Dox. Moreover, MO as a mono-treatment and the co-treatment of MO + Dox upregulated p53 and in contrast, downregulated the expression of Parp-1.

Conclusion: Moringa oleifera aqueous leaf extract possesses antiproliferative potential in MCF-7 cells by inducing oxidative stress and apoptosis. However, repeat experiments need to be conducted to confirm the results.

LP04

THE COMPARISON OF THREE DIFFERENT ISOLATION METHODS OF EXTRACELLULAR VESICLES FROM PLASMA

Authors: AJ Willers and SM Meiring

Affiliation: Department of Haematology and Cell Biology

Presenter: AJ Willers

Introduction: Extracellular vesicles are small vesicles that split from cell membranes of various parent cells like cancer cells and endothelial cells. They serve various functions and are essential in thrombosis and therapeutic research. A method to isolate extracellular vesicles is necessary to expand research using extracellular vesicles as biomarkers and in therapy. However, they are challenging to isolate due to their small size. Different methods exist to isolate extracellular vesicles, but currently, there is yet to be an accepted standardized method that is generally utilised. This research project aimed to determine which isolation method yielded the highest number of extracellular vesicles.

Methods: The study's objective was to isolate and quantify extracellular vesicles using three isolation techniques, namely filtration, ultracentrifugation, and size exclusion chromatography, to determine which technique had the highest extracellular vesicle yield. This research project followed a laboratory-based observational study design. Extracellular vesicles were isolated from five archived platelet-poor plasma samples using filtration, ultracentrifugation, and size exclusion chromatography. The isolated extracellular vesicles were quantified using micro-flow cytometry. The data obtained were analysed using descriptive statistics.

Results: The results obtained supported literature that size exclusion chromatography yielded the highest number of extracellular vesicles. There was a significant difference between the three different methods. Size exclusion chromatography yielded the highest number of extracellular vesicles and had the lowest variation, which means that it had the most consistent results over three days. Ultracentrifugation had more variation and thus less consistent results. Filtration is not recommended as it was difficult to extract the extracellular vesicles, resulting in a very low yield of extracellular vesicles. It was the least consistent method with the highest variation.

Conclusion: In conclusion, the isolation method that yielded the highest number of extracellular vesicles and that had the most consistent results over the three days was size exclusion chromatography. Filtration had no indication that all isolated samples were successfully removed from the filter. Ultracentrifugation had high centrifugal forces that may have caused proteins to aggregate and be mistaken for extracellular vesicles. Size exclusion chromatography is however expensive, but it had the least variation, was consistent and yielded the highest number of extracellular vesicles.

LP05

A RETROSPECTIVE REVIEW OF NEGLECTED TROPICAL DISEASES DIAGNOSED ON HISTOPATHOLOGICAL SPECIMENS IN THE FREE STATE PROVINCE, SOUTH AFRICA, OVER A SIX-YEAR PERIOD (2015-2020)

Authors: DL Le Grange, SF Pillay, L Budding, J Goedhals and C Van Rooyen

Affiliation: Departments of Anatomical Pathology and Biostatistics

Presenter: DL Le Grange

Introduction: Neglected tropical diseases (NTDs) are a heterogeneous group of medical afflictions that commonly occur in impoverished populations. NTDs are primarily diagnosed in tropical areas between the Tropic of Cancer and the Tropic of Capricorn. South Africa is not situated in this region where tropical diseases often occur. However, the high poverty rate in South Africa makes the country susceptible to NTDs. NTDs are associated with high morbidity; they are chronic and debilitating diseases.

Methods: SNOMED searches were conducted on the TrackCare database to identify all NTDs diagnosed on histopathological specimens submitted to the Department of Anatomical Pathology, National Health Laboratory Services (NHLS), Universitas, from 1 January 2015 to 31 December 2020. All NTDs diagnosed on histopathological specimens from state sector hospitals in the Free State were included in this study. The demographics, biopsy site and referring hospital were noted for each case identified.

Results: A total of 72 NTDs were diagnosed in our patient cohort. The five most common NTD diagnoses were: echinococcosis 45.83% (n=33), bilharzia 18.06% (n=13), leprosy 12.50% (n=9), mycetoma 11.11% (n=8), and intestinal worms 6.94% (n=5). 30.30% (n=10) of patients diagnosed with echinococcosis came from the Free State's neighbouring country, Lesotho.

Conclusion: Echinococcosis is the most prevalent NTD diagnosed in central South Africa. We recommend that the South African Department of Health add echinococcosis to the principal NTDs of significance in South Africa, alongside soil-transmitted helminths, schistosomiasis, leprosy, and rabies. We advocate for further epidemiological studies on echinococcosis to be conducted in Lesotho.

LP06

THE ADAMTS13-VWF AXIS IN HIV-ASSOCIATED THROMBOTIC THROMBOCYTOPENIC PURPURA

Authors: PD Mongalo and SM Meiring

Affiliation: Department of Haematology and Cell Biology

Presenter: PD Mongalo

Introduction: Thrombotic thrombocytopenic purpura (TTP) is a potentially fatal thrombotic microangiopathic disorder that can occur secondary to human immunodeficiency virus (HIV) infection. The pathogenesis involves a deficiency of the von Willebrand factor (VWF) cleaving protease ADAMTS13 and the presence of anti-ADAMTS13 autoantibodies. This study compares ADAMTS13 level and activity, VWF and VWF-propeptide levels, and thrombin generation in HIV-associated TTP patients to an HIV-positive non-TTP control group.

Methods: Plasma from fifty-nine (59) patients diagnosed with HIV-associated TTP and hundred (100) HIV-positive plasma samples from HIV-infected patients without TTP were used as controls. ADAMTS13 levels and activities were performed (Technoclone kits). VWF antigen and VWF propeptide levels and thrombin generation were also measured on these plasma samples.

Results: The ADAMTS13 antigen levels of HIV-associated TTP patient plasma samples ranged from 0% - 48%, including 8 samples having undetectable ADAMTS13 antigen levels of 0%. The ADAMTS13 activity levels were all less than 10%. Only a small percentage (15%) of the HIV-positive cohort plasma samples had slightly reduced ADAMTS13 levels from 36 to 50% (the normal range is 50-150%). The ADAMTS13 antigen and ADAMTS13 activity levels of the HIV-associated TTP and HIV-positive control groups were compared and differed statistically significantly with a p-value of <0.05. The VWF and VWF propeptide levels were increased (mean values >300%, normal range 50-150%) in both groups with no statistically difference between the two groups. Thrombin generation was increased in both groups, but more in the HIV-associated TTP group with a peak-thrombin of 410 nM compared to the 304 nM of the HIV group without TTP where the normal range is between 150 and 250nM.

Conclusion: We speculate that HIV might not trigger HIV-associated TTP, since reduced ADAMTS13 antigen and activity levels have only pathophysiological relevance in acquired TTP and the thrombin generation is increased in both groups.

LP07

THE EFFECT OF MICROVESICLES ON THROMBIN GENERATION IN SEVERE COVID-19 SAMPLES

Authors: BS Nhubunga, SM Meiring and FE Smit

Affiliation: Departments of Haematology and Cell Biology and Cardiothoracic Surgery

Presenter: BS Nhubunga

Introduction: Microvesicles are detected in healthy and unhealthy individuals but are mostly elevated with diseases including venous thromboembolism. Recent data suggests that EV has a significant role in developing and treating COVID-19 as an intercellular and carry the initiator of blood coagulation, Tissue factor (TF). Individuals with COVID -19 develop clots, which leads to complications such as stroke and heart attack. Thrombin generation is a crucial part of the coagulation system, and can be influenced by the presence of microvesicles in the circulation. In this study, we determined the effect that microvesicles have on thrombin generation in severe COVID-19 patients, including normal pool plasma as a control.

Methods: A thrombin generation assays (TGA) were performed on forty severe COVID-19 patient samples before and after microvesicle removal using a microvesicle filtration system. The mean peak thrombin; Velocity-index and area under the curve were calculated for each group and the percentage contribution of microvesicles to these parameters were calculated.

Results: Microvesicles contributes to thrombin generation in various parameter. 46% to Peak thrombin, 54% to the Velocity-Index and 36% to the area under curve in severe COVID-19 plasma samples.

Conclusion: Microvesicles play a noteworthy role in thrombin generation by significantly increasing it in severe COVID 19.

LP08

THE INFLUENCE OF APOLIPOPROTEIN ALLELIC GENE VARIANTS (G1 AND 2) AND HIV-1 PARTICLE MUTATIONS IN PATIENTS WITH KIDNEY FAILURE AND DETECTABLE VIRAL PARTICLES IN PERITONEAL DIALYSIS EFFLUENT WHILE ON ANTIRETROVIRAL THERAPY

Authors: T Mooko, FB Bisiwe, G Marx, P Chikobvu, MM Nyaga, TRP Mofokeng and KC Ndlovu

Affiliation: Departments of Internal Medicine, Genetics, and Community Health

Presenter: T Mooko

Introduction: Apolipoprotein 1 (APOL1) G1 and 2 renal allelic risk variants are common in kidney disease patients of African ancestry. Aim: To determine the influence of APOL1 variants in ESKD and non-ESKD HIV positive and negative cohorts.

Methods: This case-control study enrolled 40 case, HIV-positive ESKD and 160 controls, non ESKF HIV positive (n=80) and negative (80). Human DNA was genotyped using commercial assays.

Results: Study participants in the case and two control cohorts were enrolled with a median age of 42.8 (IQR, 38.47 - 48.57), 41 (37- 46.5) and 41 (37 - 47). The frequency of APOL1 risk variants (G1: rs73885319 and rs60910145 and G2: rs71785313) were 15.5% (31/200), 9.0% (18/200), and 22% (44/200), respectively, in the entire study population. The frequency of the G1:rs73885319 polymorphism was significantly increased among those with ESKD at 32.5% (13/40) compared to non-ESKD HIV-positive and HIV-negative cohorts at 11.25% (9/80) and 11.25% (9/80), respectively ($p<0.004$). The presence of both G1 risk genotypes (rs73885319 and rs60910145) was higher among those with ESKD at 15% (6/40) compared to the two control cohorts without ESKD at rates of 3.8% (3/80) and 1.2% (1/80), respectively ($p< 0.009$). On logistic regression, the presence of both G1 risk genotypes was the only factor associated with a significantly increased odds ratio of 7.1 (95% CI, 1.14-44.3; $p< 0.036$) for the development of ESKD.

Conclusion: The presence of G1: rs73885319 and rs60910145 polymorphism of the APOL1 gene is suggested to be a significant factor in the development of ESKD.

LP09

TESTING RESIDUAL XPERT® MTB/RIF ULTRA DNA FOR DOWNSTREAM APPLICATIONS

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Affiliation: Department of Microbiology, NHLS

Presenter: ZT Skosana

Introduction: The Xpert MTB/RIF Ultra assay (Ultra) is the first-line test for diagnosis and rifampicin-resistance (RR) testing for Tuberculosis (TB). Once RR-TB is confirmed, this is followed by second-line fluoroquinolones (FQs) and injectables (SLIDs) drug susceptibility testing using the GenoType MTBDRsl line probe assay (LPAsl). A previous study showed that cartridge extracts (CE) from used Ultra cartridges (usually discarded after use) could be used for LPAsl, at a defined minimum cycle threshold (CTmin) cut-off. Obtaining rapid results may allow patients to receive a pre-extensively drug resistant (XDR)-TB diagnosis from a single specimen rapidly. This study evaluated whether CEs are suitable for LPAsl testing at the National Health Laboratory Services (NHLS) Universitas Academic Laboratory, Bloemfontein.

Methods: Used Ultra cartridges with positive RR-TB results on sputa from individuals with symptoms suggestive of TB were collected (n=132) from NHLS laboratories in the Free State. CEs in the diamond-shaped cartridges chamber were recovered, stored at -20°C and subsequently used for LPAsl (5µl of CE). Where available, LPAsl on matching positive Mycobacterium Growth Indicator Tube (MIGIT) cultures was done as the reference standard (in addition to programmatically available results).

Results: Of the 132 collected samples, 68% (90/132) had culture results, and of these, 53% (48/90) received LPAsl testing, with 50% (24/48) having a MIGIT culture available. Actionable LPAsl results, at any CTmin, were achieved for 71% (17/24) of CEs, with 94% (16/17) susceptible to all LPAsl drugs and concordant to the reference standard. There was one discordant result which showed FQ resistance on CE but was susceptible using culture. When recommended CTmin threshold was applied, all samples had actionable results. All non-actionable results, 29% (7/24), corresponded to low and very-low semi-quantification Ultra results.

Conclusion: The study shows that LPAsl using CE is feasible for preXDR-TB testing without awaiting follow-up samples, saving time and resources.

LP10

SEQUENCING MYCOBACTERIA AND ALGORITHM-DETERMINED RESISTANT TUBERCULOSIS TREATMENT (SMARTT) TRIAL ASSISTED IN A RESCUE REGIMEN FOR A DIRE CASE

Authors: A Van der Spoel Van Dijk, N Mhlambi, EC Conceiçã, K Miala, B Fanampe, F Wells, TH Heupink, L Verboven, L Setlhare, M Mhalmbo, Z Sibeko, F Ndebele, S Charalambous, G Churchyard, R Warren and A Van Rie

Affiliation: Department of Microbiology, School of PathologyPresenter: Van der Spoel Van Dijk A

Presenter: A Van der Spoel Van Dijk

Introduction The SMARTT trial assisted with rifampicin drug-resistant tuberculosis (DR-TB) treatment decisions using two legs, standard of care (SOC) and automated treatment recommender for analyses for all laboratory (Lab), drug susceptibility and gene sequencing drug-resistant causing mutation data to compare machine learning and expert feedback to provide an optimal 4-drug regimen. Amongst a highly challenging population, one case stood out.

Methods History was investigated. A woman with DR-TB was initiated on the all-oral BDQ-LZD-CFZ-LFX-ETO-PZA-INH (high-dose) regimen. Fluoroquinolone (FQ) resistance on LPA caused a changed treatment to BDQ-LZD-CFZ-DLM-PAS (month 1). The culture was negative at month 4 but reverted (month 11), and she absconded. She returned after a week and started with BDQ-CFZ-TZD-LZD-DLM-PAS. Month 4 culture showed phenotypic BDQ resistance, but the patient was lost to care from month 5 for 7 months when the SMARTT trial team met with her for study initiation. The SMARTT team collected sputum cultured by the Lab to positivity and sent it for whole genome sequencing (WGS) (Illumina technology). The FSDOH MDR-TB collaborators were informed and initiated contact tracing of family and associates.

Results The isolate had resistance genes for INH (inhA_G-154A), RIF/RBT (rpoB_Ser450Leu), PZA (pncA_Gly97Asp), EMB (embB_Met306Val), LFX/MFX (gyrB_Glu501Asp), BDQ/CFZ (mmpR5, Rv0678_Gln22Pro), ETO (inhA_G-154A) and SM (rrs_C517T). Despite having some variants, the isolate was judged susceptible to AMI, TZD, DLM, LZD, PAS and imipenem/meropenem. The patient was hospitalised and initiated on LZD-DLM-PAS-TZD-imipenem and clavulanic acid and received a disability grant and support from a psychologist and social worker. The phylogenetic tree did not identify DR isolates with <12 SNP differences from patients in the same province.

Conclusion Contact tracing of five household members and two other close contacts revealed no active TB cases. The SMARTT trial and WGS were valuable in identifying a rescue treatment regimen and were complementary to contact tracing for transmission assessment.

LR01

THROMBIN'S UPS AND DOWNS: THE EFFECT OF CHACMA BABOONS' NATURAL ANTICOAGULANTS AND FACTOR VIII LEVELS ON ENDOGENOUS THROMBIN GENERATION

Authors: QA van Staden, SM Meiring, C Conradie and J Joubert

Affiliation: Department of Haematology and Cell Biology

Presenter: QA van Staden

Introduction: Non-human primates are useful models of human haemostasis, but distinctions do exist. Chacma baboons have greater overall thrombin generation potentials than humans - primarily due to a prolonged thrombin generation "tail" and time-to-peak. The aim of this study was to explore whether differences in factor VIII or natural anticoagulant levels exist, which may impact thrombin generation, and explain these observations.

Methodology: Activated protein C, antithrombin, factor VIII, and protein S were measured using commercially available chromogenic and clot-based assays, in 40 Rhesus positive, ABO typed (n=30 group O and n=10 non-O), male (n=14) and female (n=26) Chacma baboon platelet poor plasma samples. Activities were compared with pooled normal human plasma.

Results: The mean antithrombin (106,15%) and activated protein C activities (161,75%) were increased, while protein S levels (48,43%) as well as protein S (55,55%) and factor VIII activities (96,68%) were decreased in comparison to humans. The means for antithrombin (108,92%), activated protein C (172,85%) and clotting protein S (58,08%) were higher in female Chacma baboons. Conversely, the mean free protein S was similar between sexes, but factor VIII activity was lower in females (90,77 %). There were no significant differences across ABO blood groups, however, factor VIII activity was 13,19% lower in group O baboons. The activated protein C kinetic ratio increases in baboons were significantly higher compared to humans, before ±55 minutes.

Conclusion: The timing of the peak increase of activated protein C explains the slower time-to-peak and decreased thrombin peak. The tail is explained by the early consumption of the reduced protein S available, leaving activated protein C without its cofactor, allowing thrombin generation to continue unabated. These findings explain baboons' greater thrombin generation, identify components to control for in global assays, and introduce timing as an essential difference in the Chacma baboon haemostasis model.

LR02

THE PREVALENCE OF ATHEROSCLEROSIS IN A DIVERSE SOUTH AFRICAN POPULATION - A POST-MORTEM PERSPECTIVE

Authors: WJ Janse van Rensburg

Affiliation: Human Molecular Biology Unit

Presenter: WJ Janse van Rensburg

Introduction: Cardiovascular diseases (CVDs) are the number one cause of mortality worldwide. The disease profile of CVD varies considerably between different demographic groups and socioeconomic status, a phenomenon described as epidemiological transition. Atherosclerosis remains a major risk factor for CVD, and thus, believed to be a good indicator of the CVD profile in a population. We aimed to determine the prevalence of atherosclerosis in a diverse South African population.

Methods: A retrospective file-audit was done on 10,240 forensic post-mortem reports done at a forensic pathology mortuary in South Africa, over 10-years.

Results: European descent males were the worst affected, with roughly one-quarter having coronary artery (CA) or large vessel (LV) atherosclerosis. European descent females followed closely, with one-fifth of the population having CA atherosclerosis and approximately a quarter having LV atherosclerosis. African descent males and females had a substantially lower prevalence in atherosclerosis for both CAs and LVs than European descendants. The mixed-ancestry population had a slightly higher prevalence of atherosclerosis in CAs and LVs than in the African population; however, it was still far lower than the European group. Some unexpected deviations in prevalence were noted over the course of 10-years.

Conclusion: The substantial difference in prevalence of atherosclerosis shows that in our region people of African descent are at a much earlier stage of CVD epidemiological transition than people of European descent, and consequently more sensitive to economic fluctuations. However, follow-up studies are required to elucidate aetiological factors in cardiovascular health in our region.

LR03

DEVELOPMENT OF A DIET-INDUCED ATHEROSCLEROSIS RAT MODEL TO EVALUATE DRUG INTERACTIONS IN A LANGENDORFF ISOLATED PERFUSED RAT HEART SYSTEM

Authors: A Lewies, V Kodogo and FE Smit

Affiliation: Department of Cardiothoracic Surgery

Presenter: A Lewies

Introduction and goal: Atherosclerosis leads to impaired hemodynamic function, affecting the effectiveness of vaso-and cardioactive drugs. The Langendorff isolated rat heart model is an ex vivo method that can be used to test the effect of pharmacological substances on cardiac and coronary function. Rat atherosclerosis models can be created using a cholesterol-containing high-fat diet, vitamin D, and propylthiouracil (PTU) administration. The aim of this study was to induce atherosclerosis in rats using a cholesterol-containing high-fat diet supplemented with vitamin D and PTU (cholesterol diet).

Methods: Male Sprague-Dawley rats were fed a control diet (n=8) or a cholesterol-diet (n=10) for 11 weeks. Bi-weekly whole blood cholesterol (total cholesterol, high-density lipoprotein (HDL), low-density lipoprotein (LDL), and triglycerides) measurements were made. At the end of the study, rats were euthanised and histology (H&E) was performed. Serum measurements of calcium, total cholesterol, HDL and LDL were made. The inflammatory response (IL-6, CRP, TNF-α and Serum Amyloid A (SAA)) and endothelial function (eNOS and intercellular adhesion molecule 1 (ICAM1)) were measured.

Results: Rats on the cholesterol diet had increased cholesterol levels over the study period. The cholesterol-fed group had significantly higher serum calcium, LDL, and total cholesterol levels than the control group. The cholesterol-fed group also had a significantly higher inflammatory response and endothelial dysfunction (significantly lower eNOS). Atherosclerosis was also confirmed on histology.

Conclusion: A cholesterol-containing high-fat diet supplemented with vitamin D and PTU induces signs of atherosclerosis in rats. The hearts can be used on the Langendorff system to evaluate the effect of vaso-and cardioactive drugs on cardiac function in normal (non-atherosclerotic) and atherosclerotic rat hearts.

LR04

SAMPLE SENESCENCE OR ATYPICAL CLL? THE EFFECTS OF PRE-ANALYTICAL VARIABLES ON THE FLOWCYTOMETRIC DIAGNOSIS OF CLL

Authors: SM Grobler, AC van Marle and JP Roodt

Affiliation: Department of Haematology and Cell Biology

Presenter: SM Grobler

Introduction: Chronic lymphocytic leukaemia (CLL) is a clonal haematological disorder. Immunophenotyping by flow cytometric analysis is vital in establishing the diagnosis of CLL. A Matutes score of more than three is considered CLL, whereas a score of three, assigned due to atypical expression of surface antigens, is deemed atypical CLL. Various studies have reported on the impact of pre-analytical variables on the quality and reproducibility of flow cytometric data. This study aimed to determine whether the effects of sample age and storage conditions on surface antigen expression can change the diagnosis from CLL to atypical CLL.

Methods: Serial flow cytometric analysis (baseline, 24 hours, 48 hours, 72 hours, 96 hours) was performed on peripheral blood samples, stored at room and refrigerator temperatures, from ten patients with CLL. We recorded the percentage and intensity of antigen expression at these time points and assessed whether this affected the adapted and modified Matutes scores.

Results: Storage temperature and sample age significantly affected sample integrity. CD5, CD23 and CD200 showed statistically significant changes in antigen expression over time and proved more stable at refrigerator temperature. sIgM, however, showed significantly decreased antigen expression in the refrigerated sample. Two samples already showed changes in the adapted and modified Matutes scores at 24 hours, regardless of storage temperature. The scores of most room temperature samples (n=6) and four refrigerator samples changed to atypical CLL at 48 hours. A majority shift in diagnosis for the refrigerator samples was only seen at 96 hours.

Conclusion: Results confirm that sample age and storage temperature play a significant role in the percentage- and intensity of expression of surface antigens in CLL samples and can change the final diagnosis made by flow cytometry. Surface antigen expression is better preserved when stored at refrigerated temperatures and should be analysed within 48 hours of collection.

LR05

A NOVEL POPULATION-SPECIFIC VARIANT CAUSING AN ALLELIC DROPOUT IN THE D19S433 SHORT TANDEM REPEAT LOCUS

Authors: A Soldati, A De Kock and JF Kloppers

Affiliation: Department of Haematology and Cell Biology

Presenter: A Soldati

Introduction: The analysis of Short tandem repeats (STRs) has proven useful for determining parentage and biological relatedness. STRs are 2-6 base pair (bp) tandem repeat units inherited following Mendelian laws. One or two STR loci parent-child mismatches may be observed in parentage analysis. These are "apparent STR loci mismatches" that result from null alleles caused by STR primer-binding site variants. These may lead to false parentage exclusion. Null alleles are commonly detected when using commercially available STR kits. The National Health Laboratory Service (NHLS) paternity testing facility has previously identified the D19S433 locus as a locus where mismatches frequently occur.

Aim: This study aimed to characterise apparent STR loci mismatches observed in the D19S433 locus during parentage investigations at the paternity testing facility at the NHLS Universitas Hospital.

Methods: A total of 100 previously tested non-exclusion parentage cases containing parent-child allelic mismatches were included in this study. 14 of these cases had mismatches at the D19S344 locus. Polymerase chain reaction (PCR) using designed primers was performed to amplify the D19S433 locus for each sample. The resulting fragments were Sanger sequenced and analysed.

Results: A guanine to thymine (G>T) Single Nucleotide Variant (SNV) located 21 bp downstream from the D19S433 repeat region was detected in all the samples. The variant resulted in the dropout of allele 8, thus providing the cause of the parent-child apparent opposite homozygous genotypes observed previously using the VeriFilerTM Express PCR amplification kit. The variant is thought to be unique to the population of African ancestry.

Conclusion: We identified a novel variant causing a null allele at the D19S433 locus. Null alleles affect parentage outcomes, as a biological parent can be falsely excluded. Therefore, more attention should be dedicated to identifying and characterising primer-binding site variants of STRs within multiplex typing systems used in parentage analysis.

LR06

GLYPHOSATE RESIDUE IN CAT AND DOG FOOD SOLD IN SOUTH AFRICA

Authors: CD Viljoen, S Sreenivasan Tantuan and C Ogden

Affiliation: School of Biomedical Sciences

Presenter: CD Viljoen

Introduction: Cat and dog food is sold as dry kibble or wet food. These products are made using multiple ingredients, including meat by-products and grain. Grain is also a bulking agent in kibble and may constitute 50% or more of the product's total weight. Maize, soybean and wheat and, to a lesser extent, oats, rice, and barley are the most common grains used in cat and dog food. Currently, grain production is heavily reliant on the use of herbicides for weed management. The most common herbicide currently used in commercial agriculture is glyphosate. The aim of this study was to determine the presence of glyphosate in cat and dog food sold in South Africa.

Methods: A total of 45 cat and 53 dog food products indicated to contain grain were purchased. The samples were homogenized, and the level of glyphosate was determined using ELISA.

Results: Glyphosate was detected in all the products tested. The levels of glyphosate ranged from 0.011 to 0.065 mg/kg for wet cat food, from 0.065 to 1.080 mg/kg for dry cat food, from 0.014 to 0.703 mg/kg for wet dog food, and 0.043 to 1.164 mg/kg for dry dog food. There was a statistically significant increase in glyphosate in dry kibble compared to wet food. Dry cat food had a 108%, and dry dog food had a 111% higher level of glyphosate than wet food.

Conclusion: All the cat and dog food tested contained glyphosate residue. There was a significantly higher level of glyphosate in dry than wet food. The levels of glyphosate in the cat and dog food are below the maximum residue levels for glyphosate. However, in vitro, studies have found that glyphosate at reported levels can have genotoxic effects.

LR07

THE SEROPREVALENCE OF HEPATITIS E VIRUS IN PATIENTS THAT ARE HEPATITIS A, B AND C SERONEGATIVE: A RETROSPECTIVE, DESCRIPTIVE STUDY IN THE FREE STATE AND NORTHERN CAPE PROVINCES OF SOUTH AFRICA

Authors: SSS Maphumulo, D Goedhals, C Van Rooyen and S Vawda

Affiliation: School of Pathology and Department of Biostatistics

Presenter: SSS Maphumulo

Introduction: Hepatitis E virus (HEV) remains one of the neglected public health concerns, especially in the African setting. Routine viral hepatitis screening in South Africa (SA) includes hepatitis A virus (HAV), hepatitis B virus (HBV), and hepatitis C virus (HCV), not HEV. This raises concerns about whether HEV infections and complications thereof are neglected.

Methods: We aimed to determine the presence of acute HEV infection by detecting HEV IgM or evidence of previous exposure by detecting HEV IgG in samples tested at our laboratory for HAV, HBV, and HCV and were seronegative for all three. A total of 308 residual stored samples received between 1 May 2020 to 31 October 2020 were tested for both anti-HEV IgM and IgG antibodies. Reverse transcription real-time PCR (RT-PCR) and sequencing of the positive anti-HEV IgM specimen were conducted to detect HEV RNA and determine the HEV genotype.

Results: A total of 189/308 (61.36%) samples tested positive for anti-HEV IgG, 20/308 (9,74%) equivocal, and 99/308 (32,14%) negative. Anti-HEV IgM results showed (1/308, 0.32%) positive, 1/308 (0,32%) equivocal, and 306/308 (99,35%) negative. PCR and sequencing of the positive anti-HEV IgM specimen showed non-specific host amplification. The anti-HEV IgG seropositivity per province showed 61.07% and 77.78% for the Free State and Northern Cape provinces respectively. Using the Chi-square statistical tool, no significant relationship was detected for anti-HEV IgG in relation to sex ($p=0.84$) or age ($p=0.63$). The anti-HEV IgG seropositivity of 61,36% obtained in this study was high compared to previous SA studies.

Conclusion: The FS has a high HEV seroprevalence across the different age groups, possibly indicating a different epidemiology compared to other SA provinces. Healthcare worker education, increased awareness, better screening policies, and HEV-focused research is crucial to meet the World Health Organization's viral hepatitis elimination goals.

LR08

DURATION OF IMMUNITY AND CROSS-PROTECTION AGAINST HETEROLOGOUS SARS-COV-2 VARIANTS IN COVID- 19 RECOVERED INDIVIDUALS

Authors: MM Litabe, PA Bester and FJ Burt

Affiliation: Division of Virology

Presenter: MM Litabe

Introduction and Aim: Understanding the duration of immunity requires analysing antibody levels in multiple samples collected at different intervals after SARS-CoV-2 infection. The study aimed to investigate the duration of anti-S IgG and neutralizing antibodies in COVID-19 recovered patients and to determine the level of cross- protection against different variants.

Methods: Serum samples were collected at intervals from 100 convalescent patients between March 2021 and March 2023. Patients had been infected with different variants, and some had received vaccine. Sera was tested for anti-S IgG antibodies and for neutralizing antibodies against Ancestral strain, Delta, and Omicron variants.

Results: IgG antibody levels were significantly higher early after infection but gradually decreased over time despite vaccination and reinfection, with 85% of individuals still having detectable IgG antibodies on the final draw. Neutralizing antibodies against the Ancestral strain and Delta variant were the highest within the first 180 days post-infection and waned gradually before declining significantly. In contrast, neutralizing antibodies against the Omicron variant increased gradually with time, possibly due to reinfection. Overall, 85%, 81%, 90% of participants still had detectable neutralizing antibodies against Ancestral, Delta and Omicron on the final draw.

Conclusion: The results indicate that while IgG and neutralizing antibody levels decline with time, the majority of individuals still had detectable titers 24 months after acute infection. Additionally, results show cross-neutralization and potentially cross- protection between variants. The observed trends against the Ancestral strain and Delta variant suggest that immunity wanes over time, leading to weaker or lower neutralizing titers. In contrast, because the Omicron variant is currently in circulation, neutralizing antibody titers seem to be still maintained. Other factors, including the time of sample collection, vaccination, and possible reinfection, may have influenced the variation in neutralizing titers among individuals, ultimately demonstrating a decline of neutralizing antibodies against SARS-CoV-2 over time.

LR09

INSIGHTS INTO RWANDAN G9P[8] ROTAVIRUS STRAINS PRE- AND POST-ROTATEQ® VACCINE: REVEALS SIGNIFICANT DISTINCT SUB-CLUSTERING IN THE POST-VACCINATION COHORT

Authors: R Potgieter, P Mwangi, M Mogotsi, J Uwimana, L Mutesa, N Muganga, D Murenzi, L Tusiyenge, M Seheri, D Steele, J Mwenda and M Nyaga

Affiliation: Division of Virology

Presenter: R Potgieter

Introduction: Although the introduction of the rotavirus vaccines has substantially contributed to the reduction of rotavirus morbidity and mortality, concerns persist about the re-emergence of strains that might affect vaccine effectiveness in the long-term. The G9 strains re-emerged in Africa during the mid-1990s and has more recently become predominant in some countries. In Rwanda, during 2011 to 2016 routine surveillance period, G9P[8] persisted during both the pre- and post-vaccine period. The aim of this study was to elucidate the whole genome of Rwandan G9P[8] rotavirus strains pre- and post-RotaTeq® vaccine introduction.

Methods: Fecal samples from Rwandan children under the age of five years, (pre-vaccine n = 23; post-vaccine n = 7) conventionally genotyped and identified as G9P[8] were included in this study. Whole genome sequencing was then performed using the Illumina® MiSeq platform. Phylogenetic analysis and pair-wise sequence analysis were performed using MEGA6 software.

Results: Distinct clustering of three post- vaccination study strains was observed in all 11 gene segments, compared to the other Rwandan G9P[8] study strains. Specific amino acid differences were identified across the gene segments of these three 2015 post- vaccine strains. Amino acid differences were identified at position N242S in the VP7 genome segment of the three post-vaccine G9 strains compared to other G9 strains. This substitution occurs at a neutralization epitope site and may slightly affect protein interaction at that position.

Conclusion: These findings indicate that the Rwandan G9P[8] strains revealed a distinct sub-clustering pattern among post- vaccination study strains circulating in Rwanda, with changes at neutralization epitopes, which may play a role in neuralization escape of the vaccine candidate for these strains. This emphasizes the need for continuous whole-genome surveillance to better understand the evolution and epidemiology of the G9P[8] strains post-vaccination.

LR10

EXPRESSION AND PURIFICATION OF RECOMBINANT CRIMEAN CONGO HEMORRHAGIC FEVER ANTIGENS AS TOOLS FOR SERODIAGNOSIS

Authors: NA Makoah, MM Litabe, FB Nemg Simo, KK Maboho and FJ Burt

Affiliation: Division of Virology

Presenter: NA Makoah

Introduction: Crimean-Congo hemorrhagic fever virus (CCHFV) causes a zoonotic disease, Crimean-Congo hemorrhagic fever (CCHF) is endemic in many regions, including Africa, Asia, the Middle East, and south-eastern Europe. However, the prevalence of CCHF is not monitored in most of the endemic countries due to the limited availability of diagnostic assays.

Methods: In this study, we designed expression vectors and established a protocol to purify recombinant CCHFV glycoproteins (Gp) and nucleoprotein (NP). We designed an antigen bait to isolate human monoclonal antibodies. We investigated the utility of these proteins for serodiagnosis in an enzyme-linked immunosorbent assay (ELISA) to detect CCHFV-specific antibodies. The CCHFV genes from the South African isolate SPU187/90 were codon optimized and cloned into pCDNA3.1+, and human embryonic kidney cells (293F) were transfected with the plasmid. The expressed proteins were purified from the supernatant using nickel resins and concentrated using centrifugal filters.

Results: The purified antigens were used to develop an in-house CCHFV ELISA to detect IgG from CCHF survivors, and we efficiently detected CCHFV-specific IgG in human samples. We compared our data with a commercially available CCHFV immunofluorescence kit, and our ELISA showed similar results.

Conclusion: The results demonstrate that CCHFV antigens can be produced to a reasonable yield from 293 F and can be used as reagents for serodiagnosis development.

LR11

XPERT MTB/RIF ULTRA A TOOL TO INCREASE TIME TO RESULT AND REDUCE LOSS-TO-FOLLOW-UP BY TESTING CONTAMINATED LIQUID CULTURES TO IDENTIFY TUBERCULOSIS AND RIFAMPICIN-RESISTANCE

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Affiliation: Department of Medical Microbiology

Presenter: NJ Mhlambi

Introduction: Culture, the gold standard for detecting Mycobacterium tuberculosis (MTB), is essential for performing follow-up tests on patients with rifampicin-resistant (DR) tuberculosis (TB) with Xpert MTB/RIF Ultra (Ultra). However, culture can take weeks and is prone to contamination. Furthermore, many patients never have another specimen sent for culture and are lost by the system. We evaluated an approach piloted at National Health Laboratory Services (NHLS) GreenPoint. We examined if Ultra on acid-fast-negative contaminated MGIT cultures (marked to be discarded) can improve the time-to-diagnosis of TB and DR-TB and provide results in patients with no subsequent specimen.

Methods: Data was obtained from the National Health Laboratory Service (NHLS) Corporate Data-warehouse to determine the contamination rate at Universitas Tuberculosis Laboratory for TB cultures from February 2022 to April 2023. Contaminated cultures were collected (n=260), and 100 were selected as they met the inclusion criteria. MGIT culture was centrifuged, and 0.7 ml sediment was run on Ultra according to the manufacturer's instructions. GenoTypeMTBDRsl was done on resistant Ultra amplicons.

Results: The contamination rate was 3.08% (658/21343), and positivity was 7.4%. Only 5.8% (15/260) had a repeat specimen submitted for culture, and 85 contaminated cultures had results after 42 days of incubation. Of the 100 reincubated (42 days) and Ultra-tested cultures, 17% more were positive at 42 days, while positivity increased with 30/100 (30%), 6% DR-TB, an increase of 13% to 37.8% using Ultra within a median (IQR) of 18 (12-29) days. Decreasing time-to-TB-detection with 24 days and significantly impacting TB policy.

Conclusion: Diagnostic failure >95% of patients with contaminated cultures when not having a repeat specimen submitted despite programmatic guidance. Ultra on these cultures on the day of MGIT positivity will decrease these numbers by a third, significantly affecting loss to follow-up and timely DR-TB detection in TB management programmes.

LR12

WHOLE GENOME ANALYSIS OF RESPIRATORY SYNCYTIAL VIRUS CIRCULATING IN THE FREE STATE PROVINCE DURING THE COVID-19 PANDEMIC

Authors: H Sondlane, A Ogunbayo, M Mogotsi, M Esona, C Donato, U Hallbauer, P Bester, D Goedhals and M Nyaga

Affiliation: Division of Virology and Department of Paediatrics and Child Health

Presenter: H Sondlane

Background: Respiratory Syncytial Virus (RSV) contributes to significant morbidity and mortality in infants, globally. Primary RSV infection in children induces partial immunity, recurrent infections are inevitable, sometimes exacerbated with waned immunity. This phenomenon mirrors the upsurge in RSV cases following the extended lockdowns during the height of COVID-19 pandemic. Currently, little is known about the genomics of strains responsible for RSV outbreak in Free State Province. Additionally, lack of data exists on whole genome sequencing (WGS) of RSV strains in South Africa. This study performed WGS of RSV in children with respiratory distress and severe acute respiratory infection (SARI) during the COVID-19.

Methods: Nasopharyngeal RSV-positive swabs (n=69) were utilised. RNA was extracted using QIAmp Viral RNA Mini Kit. Overlapping fragments of RSVA/B genomes were amplified with Superscript IV One-Step RT-PCR kit. Libraries were prepared with QIAseq FX single-cell RNA kit. Sequencing was performed using Illumina MiSeq platform with V2-standard kit of 300 cycles (150x2 bp) and data analysed using Genome Detective and Geneious software. Phylogenetic analysis was performed for genotype assignment and genetic similarity of RSV strains using MEGA6 software.

Results: Complete genomes were amplified and sequenced from 36/69 RSV-samples. Of the remaining 33 samples, 19 had low RNA yield, and 14 failed to amplify. Successfully sequenced samples (n=36) yielded 21 genomes, with 17 exceeding 99-100% genome coverage, four were nearly complete, with about 80% genome coverage. Phylogenetic analysis results showed RSVA, and B strains clustered with previously characterised strains from Kenya, and Europe, and were genotypically clustered to the recognised ON1 and BA9 clades, respectively.

Conclusions: The off-season RSV epidemic in children post relaxation of COVID-19 restrictions in South Africa was driven by pre-existing strains, possibly due to waned immunity. Consequently, genomic sequencing is required to understand communal RSV circulation patterns and strain diversity.

LR13

LONGITUDINAL ENTERIC VIROME ANALYSIS PROVIDES INSIGHTS INTO EARLY GUT COLONISATION AND TEMPORAL DYNAMICS IN PAEDIATRIC SUBJECTS FROM THE FREE STATE PROVINCE, SOUTH AFRICA

Authors: MT Mogotsi, AE Ogunbayo, PA Bester, HG O'Neill and MN Nyaga

Affiliation: Division of Virology

Presenter: MT Mogotsi

Introduction: Human gut harbours a wide spectrum of viruses (collectively called the gut virome), that play a role in regulating host immunity. Generally, the gut of healthy neonates is devoid of viruses at birth, but rapidly becomes colonised and, in some instances, results in gastrointestinal illnesses. However, little is known about how this colonisation begins, its variability and factors shaping the gut virome composition. Thus, understanding the assembly and progression of enteric viral communities over time is key.

Methods: To explore early-life virome development, metagenomics sequencing was employed to analyse faecal samples collected longitudinally from a cohort of 17 infants during their first six months of life. Faecal samples were collected at four different time points from birth up to 6 months of age. Virus-enriched samples were sequenced on the Illumina MiSeq platform, and data was analysed using a bioinformatics pipeline consisting of various analytical tools.

Results: The gut virome analysis revealed a diverse and dynamic viral community, formed by a richness of different viruses infecting humans, non-human mammals, bacteria, and plants. Eukaryotic viruses were detected as early as one week of life, increasing in abundance and diversity over time. Albeit being asymptomatic, a large number of detected viruses were mainly those commonly associated with gastroenteritis, including members of the families Caliciviridae, Picornaviridae, Astroviridae, Adenoviridae, and Sedoreoviridae. The most common co-occurrences involved norovirus-parechovirus, norovirus-sapovirus, sapovirus-parechovirus. Additionally, there was a significant detection of plant-derived viruses, from the family Virgaviridae, detected from one week of age in the infants' gut.

Conclusion: Overall, the findings from this study provide a baseline knowledge on how the gut virome of healthy infants develops over time, which is a significant step towards understanding the dynamics and biogeography of viral communities in the gut of infants, especially from low income settings.

LR14

AN INVESTIGATION INTO THE INFLAMMATORY PROPERTIES OF TENOFOVIR IN HEPG2 HUMAN LIVER

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Presenter: S Vazi

INTRODUCTION AND AIM: Since the introduction of antiretroviral (ARV) drugs in 1996, the life expectancy of HIV-infected individuals has been nearly comparable to that of HIV-uninfected individuals. However, increasing evidence shows that antiretroviral therapy (ART) is associated with increased metabolic disorders, systemic inflammation, and hepatotoxicity. Tenofovir induces oxidative stress via mitochondrial DNA polymerase inhibition in HepG2 cells at chronic exposure. Although in vitro and in vivo studies have been performed to determine the effect of tenofovir on the inflammatory response, the inflammatory effect of this antiretroviral drug in liver cells still needs elucidation. Therefore, this study aimed to investigate tenofovir's potential pro- and anti-inflammatory properties in HepG2 human liver cells at different time frames.

METHODOLOGY: HepG2 cells were treated with tenofovir (1.2 µM) over 24 h and 120 h. Pro- and anti-inflammatory cytokines levels were assessed using a SimpleStep human ELISA kit specific to each analyte (IL-6, IL-1β, TNF-α, IL-10). Protein expression of (p-NF-κBp65, NF-κBp65, p-IκBα, and IκBα) was determined with western blotting. A quantitative polymerase chain reaction assessed the mRNA expression of NF-κBp65 and IkBα.

RESULTS: Tenofovir significantly increased IL-6 and 10 levels, NF-κBp65 mRNA expression and NF-κBp65, p-NF-κBp65 and p-IκBα protein expression. Additionally, a significant decrease in IL-1β levels and IκBα mRNA expression at 24 h were observed. After 120 h, tenofovir-treated cells showed an increase in p-NF-κBp65 and IκBα protein expression. Furthermore, a significant decrease in IL-6 and IL-10 levels, NF-κBp65 and IκBα mRNA expression and NF-κBp65 and p-IκBα protein expression were observed.

CONCLUSION: The study demonstrated that tenofovir elevated the anti-inflammatory cytokines at acute exposure. Tenofovir increased pro-inflammatory cytokines and downregulated anti-inflammatory cytokines at chronic exposure in HepG2 human liver cells. The knowledge obtained from tenofovir-induced inflammatory changes can provide valuable information regarding tenofovir's clinical use.

LR15

SKELETAL PROFILING: INTRODUCING THE FREE STATE COLLECTION FOR ANTHROPOLOGICAL RESEARCH

Authors: P Maass

Affiliation: Department of Basic Medical Sciences

Presenter: P Maass

Introduction: Documented human skeletal research collections are essential for understanding human variability and enabling its potential forensic application. The Free State Collection for Anthropological Research, housed in the Department of Basic Medical Sciences at the University of the Free State, is the most recent and most contemporary addition to such collections in South Africa, and only the fifth of its kind on the African continent. The aim of this study is to provide an overview of the demographic composition of this collection, and the postgraduate research based thereon in the first five years after its establishment.

Methodology: Inventory of the collection was performed, and demographic and cause-of-death information of these individuals were obtained from the departmental cadaver accession register. Descriptive statistics were generated to identify trends in the composition of the collection.

Results: Currently, the skeletal collection consists of 186 individuals that have died in the Free State, and whose remains were received between 2000 and 2018. The majority of individuals in the collection are South African Black males, with underrepresentation of other groups. Age-at-death has an overall mean of 40 years, but ranges from 19 to 86 years. The most common cause-of-death classifications were infectious and respiratory diseases. Research based on the remains in the collection from 2017 to 2022 included validation studies of existing anthropological methods, and descriptive studies of the distribution of craniofacial trauma, degenerative vertebral diseases, and skeletal markers of physiological stress.

Conclusion: Research on the new Free State Collection for Anthropological Research will provide vital information regarding regional skeletal variation, which has both anthropological and forensic implications. Additionally, comparison to other regional South African collections will aid in developing a more detailed understanding of the diverse national population in terms of skeletal adaptation to localized and shared influences.

LR16

ASSESSING CRANIOFACIAL SYMMETRY IN A FREE STATE POPULATION

Authors: D van der Merwe, E Anirudh and P Maass

Affiliation: Department of Basic Medical Sciences

Presenter: E Anirudh

Introduction and aim: Craniofacial asymmetry is defined as 'dissimilarity in the size, shape and arrangement' of facial features on opposite sides of the skull. Deviations from symmetry can be classified either as directional, fluctuating, or anti-symmetrical, and are influenced by different intrinsic- [i.e., aneuploidy, point mutations, homozygosity, etc.] and extrinsic [nutritional deficiencies, infectious disease, and parasitic load] factors. Understanding and quantifying craniofacial asymmetry is vital, therefore, to ensure accurate reconstructions, and aesthetic corrections. This study has aimed to evaluate whether a metric method [triangulation] could be used to assess craniofacial symmetry in a [Free State] cadaveric skeletal population.

Methodology: A total of eight bilateral measurements of the skulls of thirty adult African males - from the University of the Free State's research skeletal collection - were used to compose three triangles in the orbital, maxillary, and nasal regions.

Results: It was observed that the right half of the skull is larger than the left in all measurements, except the nasion-alare (0.64%) distance, however, this half presented smaller angles than the left half. The largest and smallest asymmetrical differences were noted between the alare-nasospinale (2.15%) distance and the mid-supraorbital-mid-infraorbital (0.03%) distances, respectively. Statistical tests reveal that significant statistical differences between the two halves were only noted between the nasion-zygion, nasion-zygomaxillare, and zygomatic angle.

Conclusion: This study finds that triangulation may detect relative asymmetries, but whether they are significant, needs simple statistical assessment. Therefore, it is considered an appropriate and reliable method to assess craniofacial symmetry in this regionally relevant cadaveric sample.

LR17

A PROFILE OF SKELETAL LESIONS THAT ARE ASSOCIATED WITH TUBERCULOSIS IN SOUTH AFRICA

Authors: R Masiu, D Botha and M Steyn

Affiliation: Department of Basic Medical Sciences

Presenter: R Masiu

Introduction: Tuberculosis (TB) continues to be a leading cause of death in South Africa. Its skeletal manifestation is therefore significant in forensic anthropology. This was a successive study that aimed to assess the sensitivity and specificity of skeletal lesions to accurately diagnose TB in two post-antibiotic skeletal samples.

Methodology: Skeletal remains from a Gauteng sample and those from a Free State sample who died of TB and other non-related diseases were assessed. A list of twenty-one skeletal lesions associated with TB was compiled and used to score each set of remains. Sensitivities and specificities of individual skeletal lesions were calculated. These were compared to a previous South African study that used a pre-antibiotic sample.

Results: An association was found between TB and eleven out of the twenty-one lesions. Lesions found on the ribs, crania and pelvic bones were found to be increasingly sensitive to the presence of TB and also showed an increase in specificity in the post-antibiotic era. Vertebral lesions continue to have the highest sensitivity to TB although this has declined over time. The introduction of antibiotics has reduced the prevalence of severe TB in modern populations. This, however, has resulted in contrasting changes in the sensitivity of all skeletal lesions associated with the disease.

Conclusion: This can be due to the difference in the dissemination of TB to various regions. Future studies can assess TB lesions according to their aetiology. Each of the individual skeletal lesions' profile is of diagnostic value and can be used in a differential diagnosis.

LR18

MORPHOLOGY AND BRANCHING PATTERN OF THE INTERNAL ILIAC ARTERY IN A FREE STATE MALE CADAVERIC SAMPLE

Authors: MJ Nkoi, S Govender and P Maass

Affiliation: Department of Basic Medical Sciences

Presenter: MJ Nkoi

Introduction: The internal iliac artery serves as the main blood supply to the organs of the pelvic cavity and knowledge of the branching pattern and common variations of the internal iliac artery may serve as a valuable tool for clinicians when managing bleeding brought upon by pelvic ring disruptions.

Methods: 21 formalin-fixed cadavers were dissected and the internal iliac artery was exposed. The branching pattern of the internal iliac artery was classified according to the Adachi (1928) classification and the frequency of the branching pattern of the internal iliac artery was documented. Additionally, the measurements of the branches of the internal iliac artery and those of its anterior division were recorded, and the branching pattern of the internal iliac artery was compared between left and right sides.

Results: Type 1 branching pattern occurred at 84%, which is consistent with findings from other studies done in other populations. Type 2 and 4 branching patterns were not observed in this study. The longest recorded average vessel length was the obturator artery at 52.07 mm, and the shortest average length was the superior gluteal artery at 2.59 mm. This was expected as the obturator artery has to take a more torturous route from its origin to the obturator foramen and exit the pelvic cavity while the superior gluteal artery exits the pelvic cavity shortly after its origin. The most common variation observed was the origin of the obturator artery that originated from the external iliac artery in 47.6% of the sample as opposed to its normal origin from the anterior division of the internal iliac artery.

Conclusion: The Adachi classification scheme was effective in classifying the branching pattern of the internal iliac artery on this sample and the branching pattern frequencies in this sample are consistent with those from other studies in other populations. Variability in the origin of the obturator artery was more common in this sample than those from other literature.

LR19

AUTOPHAGY ACTIVITY IN A IN VIVO BRAIN INJURY MODEL: EXPLORING THE EFFECTS OF INTERMITTENT FASTING

Authors: C Ntsapi and B Loos

Affiliation: Department of Basic Medical Sciences

Presenter: C Ntsapi

Introduction: Autophagy, a critical cellular recycling pathway, is essential for maintaining the delicate balance between cell survival and death, particularly crucial for neuronal well-being and function. Age-related decline in autophagy activity has been associated with toxic protein buildup and the development of debilitating neurodegenerative diseases, particularly in brain regions critical for learning and memory. Consequently, research efforts have focused on exploiting mechanisms that regulate intracellular protein metabolism and clearance in neurodegenerative diseases. Intermittent fasting (IF) has emerged as an accessible strategy to enhance autophagy and cellular health. Fasting has been shown to stimulate adaptive responses that activate autophagy, thereby enhancing the removal of harmful cellular components. Therefore, this study aim was to investigate the effects of IF on autophagy activity in a paraquat (PQ)-induced in vivo brain injury model.

Methods: Forty-eight C57BL/6 mice were divided into 4 groups of 12: control, 48 hr. intermittent fasting (IF), PQ, and 48 hr. IF + PQ. Controls had unrestricted access to food, 48 hr. IF group underwent alternate day fasting for 48 hours, PQ group received bi-weekly intraperitoneal (i.p) injections of PQ, and 48 hr. IF + PQ group were subjected to both 48 hr. alternate day fasting and bi-weekly PQ injections. All groups had ad lib. access to water throughout the 21-day study. Autophagy activity, cell death onset, and lipid peroxidation were assessed in whole brain extracts.

Results: Autophagic activity markers were significantly greater in the 48 hr. IF and (48 hr. IF + PQ) groups, accompanied by a significant decrease in markers of cell death onset and lipid peroxidation compared to the control groups.

Conclusion: The effect of fasting holds potential promise as a preventive strategy for maintaining optimal autophagy activity during the aging process. This approach may delay the onset of cell death, which is frequently linked to neurodegenerative diseases.

LR20

NVESTIGATING THE IMPACT OF MORINGA OLEIFERA ON CHAPERONE-MEDIATED AUTOPHAGY IN AN IN VITRO MODEL OF HEPATOCELLULAR CARCINOMA

Authors: MA Bopape, C Tiloke and C Ntsapi

Affiliation: Department of Basic Medical Sciences

Presenter: MA Bopape

Introduction: The impact of hepatocellular carcinoma (HCC) is most significant in developing countries, including South Africa Emerging evidence suggests that the cell survival mechanism, chaperone-mediated autophagy (CMA), promotes HCC tumour progression and chemotherapeutic drug resistance. In contrast, phytochemical extracts of the medicinal plant, Moringa oleifera (MO), have been shown to induce apoptosis of HCC cells. MO leaves have the greatest abundance of phytochemicals displaying anticancer potential. Investigating the interplay between all-trans retinoic acid (ATRA), a potential inhibitor of CMA, and MO regarding their effects on CMA holds potential in identifying adjuvant therapeutic approaches for treatment modalities for HCC. In this study, we assessed the in vitro effects of MO aqueous leaf extract on CMA activity in human HepG2 cancer cells.

Methods: HepG2 cells were cultured and exposed to MO and ATRA for 24-hours before a cell viability assay was performed. The cells were divided into three treatment groups: MO, ATRA and a combination group of MO and ATRA. A Caspase-Glo™ cell death assay was performed. Western blot analysis was also performed to assess changes in lysosome-associated membrane protein type 2A (LAMP2A) and hexokinase II (HK2) protein expression levels.

Results: The cell viability assay displayed a dose-dependent decline in reductive capacity following MO and ATRA exposures. The cell death assay revealed a decline in caspase-9 activity following the respective treatment exposures. There was a corresponding decline in caspase-3 and 7 activity following respective treatment exposures, except for MO where an increase in caspase-3 and 7 activity was observed. Western blot analysis showed a decline in the expression of LAMP2A and a corresponding increase in the expression of the CMA cargo protein, HK2.

Conclusion: These results suggest that these compounds have the potential to inhibit the growth and proliferation of HCC cells, which is a promising adjuvant therapeutic approach against HCC.

LR21

NO CALCIFICATION AND INFLAMMATION DEMONSTRATED IN A TRANSCATHETER HEART VALVE CONTAINING FIXED AND UNFIXED DECELLULARISED BOVINE PERICARDIUM SCAFFOLDS IN A JUVENILE SHEEP STUDY

Authors: FE Smit, A Doubell, A Lewies, JJ Van Den Heever, P Marimuthu, CJ Jordaan, L Botes and H Weich

Affiliation: Department of Cardiothoracic Surgery

Presenter: FE Smit

Introduction: Biological heart valves using glutaraldehyde fixed bovine pericardial leaflets were developed in the 1970s as an alternative to mechanical valves requiring lifelong anticoagulation. However, these valves degenerate, develop pannus or calcify because of toxicity or immune responses, especially in young rheumatic heart disease patients. To address this, a proprietary decellularization process was developed as a standalone process or combined with monomeric glutaraldehyde fixation and an amino acid detoxification process. Implant studies in rats demonstrated no toxicity, no calcification, and remodeling in both of these groups. This study compared fixed and unfixed tissue scaffolds to commercial glutaraldehyde pericardial patch material (Glycar) in transcatheter heart valve (THV) implants in the right ventricle outflow tract (RVOT) of juvenile sheep after 180-day implantation.

Methods: Nine juvenile German Merino sheep received THV implants; three with decellularised bovine pericardial scaffold (Group1), three with fixed decellularised pericardial (Group2), and three using Glycar tissue (Group3). Clinical and echo data were recorded over a 180-days. Macroscopic data and X-ray analyses were conducted at explantation. Pre- and post-implantation studies on the valve leaflet tissue included H&E, van Gieson, von Kossa, SEM and TEM studies and dynamic strength testing.

Results: Group 3 showed extensive calcification. Microscopy showed retention of dense collagen within the pericardial patch with extensive pannus formation, calcification, and no re-endothelialisation but retained collagen structure. In groups 1 and 2, the pre-implantation decellularized collagen structure was completely retained with no recellularization, cell infiltration, or calcification. SEM showed better re-endothelialisation in group 1 with limited pannus in group 2. TEM demonstrated well-organized collaged networks in group 1and 2. Strength and Young's modules were well retained in groups 1 and 2.

Conclusion: The decellularisation process, with or without fixation, produces a tissue scaffold with a low immune profile resulting in resistance to calcification whilst retaining tissue integrity and strength.

LR22

EFFECT OF THREE DIFFERENT PROCESSING TECHNIQUES ON PROPERTIES AND CLINICAL PERFORMANCE OF PULMONARY HOMOGRAFTS WITH EXTENDED ISCHEMIC TIME IN THE RVOT OF AN OVINE MODEL

Authors: JJ van den Heever, CJ Jordaan, A Lewies, J Goedhals, L Botes, P Mari Muthu, PM Dohmen and FE Smit

Affiliation: Department of Cardiothoracic Surgery, Pathology

Presenter: JJ van den Heever

Introduction and Aim: Cryopreserved homografts are used worldwide to repair RVOT abnormalities, but still calcify, structurally deteriorate and ultimately fail. Decellularization of pulmonary homografts to mitigate calcification and recipient immune response was evaluated and compared to cryopreserved homografts in vitro and in vivo.

Methods: Pulmonary homografts were harvested from juvenile sheep, subjected to 48h cold ischemia and either cryopreserved, decellularized or decellularized, fixed and detoxified(EnCap treated). Leaflet and wall tissue were evaluated for structural integrity pre- and post implantation, clinical performance and calcification after 180 days in the RVOT of young sheep.

Results: Large interfibrillar spaces in the extracellular matrix of decellularized homografts, collapsed collagen network in the cryopreserved group and dense, compacted collagen in the decellularized plus EnCap-treated group. Collagen in cryopreserved homografts appeared disrupted and fractured on TEM, but more uniform in both decellularized groups. Decellularization did not reduce TS and YM of leaflet and wall tissue. Decellularized and fixed homografts displayed poor hemodynamic characteristics and valve function, stenosis leading to bacterial endocarditis and premature death/sacrifice. Increased annulus diameter with trivial(1/5) pulmonary regurgitation(PR) and thin, translucent leaflets with good coaptation in the decellularized explants compared to 3/5 PR with thickened, retracted leaflets in the cryopreserved group. Loss of interstitial cells in cryopreserved valves at explantation, and intact collagen network with extensive, uniform ingrowth of host fibroblasts in decellularized scaffolds. Von Kossa demonstrated calcific deposits only in the cryopreserved group, and young fibroblasts with vacuoles and endoplasmic reticulum in the decellularized group on TEM.

Conclusion: Cryopreserved homografts deteriorate over time due to loss of cellularity and calcification, while decellularized pulmonary scaffolds demonstrated good tissue properties, good hemodynamic characteristics, limited calcification, tissue remodeling and growth potential. Additional GA-fixation of decellularized homografts defies potential benefits of decellularization and may be counterproductive in growing individuals.

LR23

THE HEPATOPROTECTIVE EFFECTS OF MORINGA OLEIFERA AGAINST ANTIRETROVIRAL INDUCED CYTOTOXICITY IN HEPG2 CELLS

Authors: M Saki, H De Villiers, C Ntsapi and C Tiloke

Affiliation: Department of Basic Medical Sciences

Presenter: M Saki

Introduction and aim: The untreated human immunodeficiency virus (HIV), a lentivirus species that attacks immune cells, causes acquired immunodeficiency syndrome (AIDS). HIV/AIDS is managed by the antiretroviral therapy (ART). The ART regimen contains nucleoside reverse transcriptase inhibitors (NRTIs), which are associated with oxidative stress. Medicinal plants are often used in combination with ART to diminish the side effects associated with ART use. The Moringa oleifera (MO) tree extracts have been shown to contain bioactive compounds with antioxidant effects. This in vitro study evaluated the cytotoxicity of an NRTI (tenofovir) and its potential amelioration by MO leaf extract.

Methods: HepG2 cells were exposed to tenofovir, MO, and combination (tenofovir and MO) treatment groups for 24 and 120 hours. MO aqueous leaf extract was prepared, and cytotoxicity was assessed. Markers for oxidative stress and antioxidant response were assessed using spectrophotometry, luminometry, ELISA, qPCR, and western blotting experimental techniques.

Results: At 24 hours, tenofovir decreased MDA, NRF2, SOD2, CAT mRNA, and NRF2, SOD2, and CAT protein expression. Then increased GSH, GCLC mRNA and p-NRF2 protein expression. MO decreased GSH levels, NRF2, GCLC, SOD2 mRNA expression and increased CAT mRNA, as well as NRF2, p-NRF2, SOD2, and CAT protein expression. At 120 hours, tenofovir increased MDA, NRF2 mRNA, NRF2, p-NRF2, and SOD2 protein expression. Then decreased GSH levels, GCLC, SOD2, CAT mRNA and CAT protein expression. MO decreased MDA and GSH levels, NRF2 and CAT protein expression. Then increased NRF2, GCLC, SOD2, and CAT mRNA and p-NRF2 and SOD2 protein expression. The combination treatment group downregulated MDA and upregulated the expression of NRF2, GCLC, SOD2, CAT mRNA and NRF2, p-NRF2, SOD2, and CAT proteins.

Conclusion: The addition of MO to tenofovir downregulates reactive oxygen species by upregulating the NRF2-antioxidant pathway to reduce oxidative stress. Therefore, MO has the potential to ameliorate toxicity induced by tenofovir.