

SEMDSA 57th Annual Congress 2025 - Abstracts

Oral Presentations

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Bariatric surgery outcome at Inkosi Albert Luthuli Central Hospital: a 10-year retrospective analysis

Category: Clinical - Diabetes

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Background: Obesity is a significant public health issue worldwide and is a major risk factor for diabetes, hypertension, cardiovascular disease, and stroke. In South Africa, 46% of adults are predicted to have a BMI ≥ 30 kg/m² by 2035. Several studies have demonstrated superior metabolic outcomes with bariatric surgery.

Methods: A retrospective study of patients subjected to bariatric surgery over 10 years, from January 2009 to December 2019, at Inkosi Albert Luthuli Central Hospital, Durban, South Africa. The primary outcome was weight loss 2 years after surgery, and weight loss measures at 6 months, 1 year, and 2 years. Secondary outcomes included diabetes remission, surgical complications and nutritional deficiencies.

Results: Eighty-one patients (75% female) underwent bariatric surgery; mean age was 46.7 ± 9.7 years. Laparoscopic sleeve gastrectomy was the commonest procedure (68, 83.9%).

At 2 years, there was a decline from baseline for the following: weight (145.6 ± 30.0 to 101.8 ± 24.7 kg) ($p < 0.001$), BMI (54.4 ± 10.6 to 37.8 ± 8.7 kg/m²) ($p < 0.001$), fasting plasma glucose (5.72 ± 1.93 to 4.67 ± 0.55 mmol/l) ($p < 0.001$), and HbA1c (6.5 ± 1.6 to $5.6 \pm 0.6\%$) ($p < 0.001$). Of 21 patients with diabetes at baseline, 16 (76.1 %) had remission. No deaths occurred, and surgical complications were infrequent.

Conclusion: In this study, bariatric surgery was an effective modality of treatment for patients with severe obesity. There is significant weight loss and improvement in metabolic outcomes;

However, long-term follow-up is needed to assess for durable weight loss.

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Baseline characteristics and prevalence of complications in newly diagnosed diabetes mellitus patients at a referral hospital in Bulawayo, Zimbabwe

Category: Clinical - Diabetes

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Background: There is little information on the aetiological types of diabetes and the burden of complications in Zimbabwe, where classification is often based on age at presentation. A cross-sectional (Phase 1) and prospective (Phase 2) study is being undertaken to determine the aetiological types of diabetes and prevalence (Phase 1), and incidence (Phase 2) of complications, in patients with newly diagnosed diabetes in a hospital population in Bulawayo.

Objective: To determine the baseline characteristics and prevalence of complications in newly diagnosed patients at presentation (Phase 1).

Methods: All patients with newly diagnosed diabetes aged > 12 years presenting to Mpilo Hospital, from October 2021 to August 2024 were enrolled. Data collection included demographic and medical information, clinical examination, ankle-brachial index, carotid-intima media thickness, and retinal photography. Laboratory data included HbA1c, lipids, random c-peptide, and beta-cell autoantibodies.

Results: A total of 332 (70.8% female) patients were enrolled, mean age 52.4 ± 16.7 years, BMI 29.3 ± 6.5 kg/m². Mean plasma glucose was 23.0 ± 10.0 mmol/l, HbA1c $12.0 \pm 4.0\%$, eGFR 99.0 ± 36.0 ml/min, cholesterol 4.5 ± 1.6 mmol/l, triglycerides 1.9

± 1.3 mmol/l; median c-peptide was 1.70 (0.62-3.03) ng/ml. Anti-IA2 antibodies were present in 91 (27.4%), anti-Zn8 in 61 (18.4%), and anti-GAD in 55 (16.6%). Diabetes complications were recorded in 243 (73.2%): retinopathy (12, 3.6%), peripheral neuropathy (132, 39.8%), and peripheral arterial disease (199, 59.9%). Electrocardiographic abnormalities were found in 76 (22.9%).

Conclusion: Subjects with newly diagnosed diabetes in Bulawayo, Zimbabwe, have a high prevalence of complications and beta-cell autoantibodies.

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Maternal and neonatal outcomes in patients with type 2 diabetes mellitus (T2DM) in pregnancy at Chris Hani Baragwanath Hospital

Category: Clinical - Diabetes

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Background: Hyperglycaemia in pregnancy is associated with adverse maternal and foetal outcomes. There is limited local data on type 2 diabetes mellitus (T2DM) in pregnancy. This study aimed to describe the clinical and biochemical characteristics, and outcomes of women with T2DM in pregnancy.

Methods: A clinical record review (2013-2022) of 633 pregnant patients with T2DM at a Johannesburg tertiary hospital was conducted.

Results: The median (IQR) age, body mass index and duration of diabetes were 35 (31-38) years, 34 (30-38) kg/m², and 3 (2-4) years, respectively. The prevalence (95 % CI) of hypertension was 38% (CI 33-42). The median initial HbA1c (%) and change in HbA1c (%) during pregnancy were 7.60 (6.50-9.10) and -1.00 (-0.20--2.50), respectively. The prevalence of caesarean section (CS) was 72% (CI 68-76). The perinatal mortality was 3.63% (CI 2.02-6.23). There was an association between maternal weight and mode of delivery (CS 94 (84-106) kg vs. normal vaginal delivery 90 (80-100) kg, $p = 0.017$).

The median gestational age (GA) at delivery was 37 (36-38) weeks. GA (weeks) at delivery was associated with previous insulin use (β -1 (95%CI-1.8--0.23), $p = 0.012$), final mean plasma glucose (β -0.54 (95%CI-0.85--0.24), $p < 0.0001$) and gestational hypertension (β -1.5 (95%CI-2.8--0.14), $p = 0.030$). The median birthweight in this cohort was 3.07 (2.58-3.45) kg. Birthweight (g) was associated with insulin use in pregnancy (β -150 (95%CI -276--24), $p < 0.019$) and median HbA1c(%) at the end of pregnancy (β -153 (95%CI 85-220), $p < 0.001$).

Conclusion: In this high-risk group, there was a high prevalence of hypertension and a high frequency of CS. Glycaemic control and insulin use influenced the gestational age at delivery and birthweight.

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The characteristics of children presenting with neonatal diabetes at a quaternary hospital in KwaZulu-Natal, Durban, South Africa

Category: Clinical - Diabetes

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Background: Diabetes mellitus is an important cause of childhood morbidity locally and internationally. It can be classified into transient (TNDM), permanent (PNDM) or syndromic neonatal diabetes. It is said to occur in 1 in 90 000 newborns outside of Africa.

Methods: A retrospective review of neonatal diabetic patients attending the paediatric endocrine clinic at Inkosi Albert Luthuli Central Hospital (IALCH) was conducted. All newly diagnosed neonatal diabetic patients referred to IALCH during the period 1st January 2008 to 30th April 2023 were included in the study. The incidence calculated in rates per 1 000 was the primary outcome.

Results: Twenty participants were included in the study. The incidence was estimated to be 1 in 163 000 live births. Clinical, biochemical and molecular genetic characteristics were studied for all participants. Analysis revealed a mutation in 17 (89%) of 19 patients. In TNDM the causes included 6q24 methylation defects (5), KCNJ11 mutations (2) and an ABCC8 mutation (1). One analysis was not done, and two analyses displayed no mutations. In PNDM participants the causes included KCNJ11 mutations (6), 6q24 methylation defects (1) and an INS mutation (1). The analysis of the participant that demised displayed no mutation. All ABCC8 and KCNJ11 mutations responded to sulphonylurea therapy.

Conclusion: There has been a lack of clinical data in South Africa describing patients with neonatal diabetes. Genetic molecular studies have revealed that 45% of patients with diabetes mellitus have an ABCC8 or KCNJ11 mutation. This is important as 100% of patients with these mutations responded favourably to sulphonylurea therapy. Early recognition is therefore important for determining clinical course, raising awareness for additional features and for guiding appropriate treatment of patients with this condition.

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Depression, but not anxiety, is associated with newly diagnosed type 2 diabetes mellitus in Cape Town

Category: Clinical - Diabetes

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Background: The aim of this study was to determine any differences in mental health (depression and anxiety) and poor psychosocial well-being (social support, quality of life, etc.) by diabetes status, in adults at high-risk for type 2 diabetes mellitus.

Methods: In a population-based cross-sectional study, socio-demographic characteristics, lifestyle behaviours (cigarette smoking, alcohol misuse, physical inactivity), and mental health and psychosocial information were collected via administered questionnaires. Depression and anxiety traits were investigated using the Patient Health Questionnaire-9 and Generalised Anxiety Disorder screening questions. Diabetes was defined as glycated haemoglobin $\geq 6.5\%$. Multiple logistic regressions determined the associations with diabetes; the basic model comprised socio-demographic characteristics, lifestyle behaviours and obesity. Mental health and psychosocial variables were entered individually in separate models.

Results: Among 674 participants, mean age (SD) among those with ($n = 100$) and without ($n = 574$) diabetes was similar: 52.4 (8.3) vs. 51.2 (9.1) years. Prevalence of depression scores ≥ 10 (25.0% vs. 12.4%, $p = 0.001$) and anxiety scores ≥ 10 (13.0% vs. 9.8%, $p = 0.418$) were higher in participants with than without diabetes, but was significant only for depression. In the basic regression model, increasing age and physical inactivity were significantly ($p < 0.05$) associated with diabetes. Participants with depression score ≥ 10 vs. < 10 were more likely to have diabetes (OR: 2.58, 95%CI:1.47–4.45, $p < 0.001$). Anxiety scores ≥ 10 vs. < 10 was not associated with diabetes (OR:1.42, 95%CI:0.70–2.71, $p = 0.303$). Measures of poor psychosocial well-being were not related to diabetes.

Conclusion: The high burden and greater likelihood of depression with diabetes suggest the need for routine screening and care of depression to be incorporated into diabetes management.

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High burden of cardiometabolic comorbidities in obese children presenting to a tertiary hospital in KwaZulu-Natal from 2002 to 2022

Category: Clinical - Diabetes

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Background: This study described the distribution of childhood obesity and their related comorbidities in < 12 -year-old children assessed at Inkosi Albert Luthuli Central Hospital (IALCH) from 2002 to 2022.

Methods: This retrospective electronic chart review included < 12 -year-old children presenting with obesity at IALCH. Data extracted comprised socio-demographic and lifestyle histories, physical examination and biochemical analyses. The WHO child growth reference was used to define obesity as z-score ≥ 2 standard deviations (SD) for 5-19-year-olds, and z-score ≥ 3 SD for < 5 -year-olds. Systolic BP (SBP) and/or diastolic BP (DBP) ≥ 95 th percentile for age, gender and height defined hypertension. SBP or DBP ≥ 90 th but < 95 th percentile defined prehypertension. Diabetes and prediabetes diagnoses were based on oral glucose tolerance tests or random blood glucose levels. Dyslipidaemia was deemed present with any abnormality of total cholesterol, low-density lipoprotein cholesterol, high-density lipoprotein cholesterol or triglycerides.

Results: Among 430 participants, 52.1% ($n = 224$) were male, 27.9% ($n = 120$) were ≤ 5 years old, and 64.7% were black African, while 27.9% were Indian/Asian. Unhealthy lifestyle behaviours were prevalent: 42.3% spent 2 hours/day on screen time and 47.9% consumed soft drinks daily. Family history of obesity (41.9%), diabetes (40.5%) and hypertension (40.0%) was common. Among participants, hypertension (46.1%) and prehypertension (12.8%) burden were high. Diabetes and prediabetes rates were 1.6% and 3.7%, respectively. Any dyslipidaemia was prevalent at 30.2%.

Conclusion: The high burden of cardiometabolic comorbidities in obese children, including those ≤ 5 years old, is concerning and warrants concerted interventions to target unhealthy dietary habits, low activity levels and sedentary behaviours to reduce obesity and its comorbidities.

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Prevalence and risk factors for hungry bone syndrome following parathyroidectomy for primary hyperparathyroidism at Inkosi Albert Luthuli Central Hospital

Category: Clinical - Endocrinology

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Background: To assess the prevalence and risk factors for developing hungry bone syndrome (HBS) following parathyroidectomy (PTX) for primary hyperparathyroidism (PHPT).

Methods: Retrospective analysis of all patients who underwent PTX for PHPT between 2003 and 2023 at Inkosi Albert Luthuli Central Hospital in KwaZulu-Natal. HBS was defined as hypocalcaemia following PTX that was profound and prolonged (longer than the 4th postoperative day) with normal or raised serum intact parathyroid hormone (iPTH).

Results: Of 117 patients (86.4% female and 71.8% symptomatic) included in this analysis, 42.7% were African, 41.9% Indian, 13.7%

White and 1.7% Mixed race. Prevalence of HBS was 20.4% ($n=24$). When compared with the non-HBS group, patients with HBS were younger, had a lower BMI, were more likely to have osteoporosis and/or osteitis fibrosa cystica (OFC) and had higher median pre-operative iPTH 162.8 [104;208.7] vs 23.1 pmol/l [15.6;37.5], $p < 0.001$ and alkaline phosphatase (ALP) 696 [308.5;1323.5] vs 111.5 [88.0;134.2] U/l, $p < 0.0001$, while 25-OH vitamin D levels were significantly lower. HBS patients had significantly longer in-hospital stays 19.5 [11.0;31.2] vs 2.0 [3.0;4.0] days, $p = 0.121$ pmol/l (OR 100.49; $p = 0.004$).

Conclusion: There was a high prevalence of HBS in this study and it increased the length of hospital stay. Risk factors for HBS should be identified before planning PTX and vigilance is required following surgery.

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A comparative study of paediatric patients with craniopharyngioma — those on growth hormone treatment versus growth hormone naive patients at Chris Hani Baragwanath Hospital

Category: Clinical - Endocrinology

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Background: Craniopharyngiomas (CPs) are rare brain tumours that affect the hypothalamic-pituitary axis, leading to endocrine deficiencies. This study evaluates the benefits and complications of recombinant human Growth Hormone (rhGH) therapy in CP patients, comparing those who received treatment with those who did not at a paediatric endocrinology unit.

Methods: A retrospective, observational study was conducted using patient records from January 2011 to January 2024. Thirty-five CP patients were included. Data were analysed using REDCap and Stata. Growth and quality of life (QoL) were assessed using PedsQL version 4.0. Statistical significance was set at 5%.

Results:

- Endocrine Outcomes: 77% of patients had GH deficiency (diagnosed via clonidine provocative testing, IGF-1 levels, clinical signs, and bone age). Nearly half (48%) developed central hypothyroidism.
- Growth Outcomes: Of the 10 patients (28%) who received rhGH, 30% showed improved growth (z-score means). However, 70% of rhGH-treated patients had poor growth due to non-compliance. The average age of rhGH initiation was delayed (12.81 years).
- Quality of Life (QoL): The average QoL score was low (32.8, normal > 100), with no significant difference between rhGH-treated and untreated patients ($p = 0.2519$, patient report; $p = 0.1473$, parent report).

- Surgical Impact on QoL: Patients who underwent radical surgery had better QoL (43.7, $p = 0.0029$) than those with Omay reservoirs (28.4, $p = 0.0156$).

Conclusion: Although rhGH therapy improved growth in some CP patients, it did not significantly impact QoL. The surgical approach played a more critical role in QoL outcomes. Delayed treatment initiation, residual tumours, and older age at presentation contributed to poorer responses, warranting further research and intervention.

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Bone health and body composition in paediatric patients with idiopathic nephrotic syndrome managed with glucocorticoids

Category: Clinical - Endocrinology

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Background: Prolonged administration of glucocorticoids (GCs) is known to have deleterious effects on growth and bone integrity. This study aimed to assess the effects of GC therapy on bone health and body composition in South African children with primary nephrotic syndrome (NS).

Methods: A retrospective record review of NS patients attending the Paediatric Renal Unit at Chris Hani Baragwanath Academic Hospital (CHBAH) between 1 January 2010 and 31 December 2019. Demographics, dual-energy x-ray absorptiometry (DXA) scans, biochemistry results and treatment history were analysed.

Results: NS was diagnosed in 346 patients; 145 met inclusion criteria. Histology showed 90 (62.1%) minimal change NS (MCNS). One hundred and twenty-four (85.5%) had steroid sensitive NS and 21 (14.5%) had steroid resistance. Sixty-two (42.7%) had at least one relapse with a median (IQR) time to relapse of 356 (179, 453) days. Thirty-three (22.8%) patients had DXA scans performed. Lumbar spine bone mineral density (BMD) Z score was -1.10 (-1.70, -0.30) and whole body less head BMD Z score was -0.81 (-1.86, -0.10). Four (2.8%) patients had documented fractures. Ten (6.9%) patients had hypothyroidism treated with thyroxine; they were younger, stunted, had lower albumin, higher cholesterol and lower bone metabolism markers at diagnosis and at last clinic visit.

Conclusion: MCNS was the predominant histopathological diagnosis in a steroid sensitive less frequently relapsing population. BMD measurements were normal. There was a low fracture prevalence (2.8%). We recommend DXA screening for patients on prolonged GC therapy and prospective studies on contributors to final height in children with NS.

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An audit of hypopituitarism in paediatric patients seen at Chris Hani Baragwanath Academic Hospital from January 2011 to December 2021

Category: Clinical - Endocrinology

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Background: Congenital hypopituitarism is a rare but important condition, as normal pituitary function is crucial for neurocognitive development, growth, metabolism, homeostasis and the progression of puberty. The objectives of the study are to describe the demographics, anthropometry, clinical presentation, MRI findings, biochemical abnormalities, bone age and response to treatment of children with congenital hypopituitarism.

Methods: A retrospective, descriptive study from 1 January 2011 to 31 December 2021 of paediatric endocrine clinic patients at CHBAH with congenital hypopituitarism ($n = 46$).

Results: Two-thirds of patients had panhypopituitarism and the remainder had hypopituitarism. The mean age at presentation was 4.7 years ($SD \pm 5.3$). The male to female ratio was 3.6 : 1 and the majority were African in race (97.8%). The most common presentation was short stature (70%) and pituitary stalk interruption syndrome (45.3%) on MRI. The height-for-age z-score was -4.2 ($SD \pm 2.1$) at baseline and -1.7 ($SD \pm 1.9$) at year 7 on treatment ($p < 0.05$) for those who received recombinant growth hormone. The mean delay in bone age was 2.6 years ($SD \pm 2.4$) before growth hormone initiation. The most common complication was hypoglycemia (43.5%).

Conclusion: Hypopituitarism is a rare disease that requires early detection. Intervention with growth hormone replacement has shown a significant improvement in the height-for-age z-score, achieving a normal range for the majority of treated patients.

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Identifying functional disparities in peripheral blood mononuclear cells of type 2 diabetic mellitus patients

Category: Basic Science

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Background: Type 2 diabetes is a global epidemic and multifactorial disorder characterized by metabolic inflammation and the constitutive activation of immune cells. However, it is unclear if there is a direct link between blood glucose levels and immune exhaustion. This study, therefore, aimed to identify

functional disparities in peripheral blood mononuclear cells (PBMCs) at different stages of disease progression.

Methods: Seventeen individuals were included in this study and subdivided as follows: healthy controls ($n = 7$, FPG 5.1 ± 0.5 mmol/L), well-controlled T2DM ($n = 4$, FPG 5.4 ± 0.3 mmol/L, HbA1c $6.6 \pm 0.3\%$) and poorly controlled T2DM ($n = 6$, FPG 15.3 ± 2.7 mmol/L, HbA1c $13 \pm 2\%$). The functional capacity of PBMCs was compared by assessing migration and phagocytic capacity, Ca²⁺ flux, release of reactive oxygen species (ROS) and mRNA expression of key inflammatory factors (TNF α , IL6, IL10, PTX3, iNOS, Arg1).

Results: Differences were detected between the well- and poorly controlled T2DM patients regarding Ca²⁺ flux (AUC), migration capacity (velocity, distance), and the expression of inflammatory factors. A strong correlation was evident between these parameters and glucose levels. However, no difference was detected in phagocytic responsiveness between groups.

Conclusion: The PBMCs of poorly controlled T2DM patients are in a state of metabolic activation.

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Diabetes adversely affects genomic integrity and telomere maintenance within adipose-tissue resident stem cells by inducing senescence.

Category: Basic Science

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Background: Diabetes mellitus (DM) is a multifactorial metabolic disorder with its inflictions causing adipose tissue derived stem cells (ADSCs) to functionally decline and senesce. Premature senescence is known for perpetually exacerbating the disorder and disrupting cellular function. The aim of this study was to determine the impact of DM-induced senescence (I-SnC) on genomic health and telomere maintenance.

Methods: Primary human ADSCs (< passage 10) were exposed to a combination of high glucose, advanced glycation end products (AGE-BSA) and TNF α in culture for a period of 3 days to induce senescence. The extent of senescence (SA- β -Gal ELISA), DNA damage (γ -H2AX immunofluorescence), oxidative stress (ROS) and telomere length (RT-qPCR) were determined. The expression of 84 genes associated with senescence and telomerase activity were furthermore assessed using micro-array analysis (RT-qPCR).

Results: Compared to control, the DM-induced senescent ADSCs showed evidence of DNA damage (γ -H2AX), oxidative stress (ROS) and a significant reduction in the mRNA expression of genes related to the DNA damage response pathway (Abl1, ATM, CHEK2, ERCC4, MRE11A, MSH3, NBN, PRKDC, RAD17, RAD50, RAP1A, RIF1, SUN1, TP53, XRCC5, XRCC6), cellular growth (Akt1,

EGF, KRAS, PLK1, PRKCA, Rb1), telomere maintenance (DKC1, NHP2, NOP10, PINX1, POT1, TERF2, TINF2, TNKS, TPPI) and the cellular response to stress (HSP90, KRIT, NCL, PURA, SMG6, SSB, TGF β). Given the short culture duration, no reduction in telomere length was however evident.

Conclusion: Taken together the data confirms that DM leads to extensive DNA damage and simultaneously impairs the damage repair response (DDR) processes.

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Association of AGER gene polymorphisms with albuminuria in South African black individuals with type 2 diabetes

Category: Basic Science

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Background: Receptors for advanced glycation end products (AGEs), RAGE, exist in two main isoforms: membrane bound RAGE (mRAGE) and soluble RAGE (sRAGE). In type 2 diabetes (T2D), chronic hyperglycaemia increases formation of AGEs which bind mRAGE, activating proinflammatory/profibrotic pathways resulting in diabetic nephropathy (DN). Polymorphisms in the gene that encodes RAGE, AGER, have been associated with DN. We aimed to determine whether sRAGE concentrations and AGER gene polymorphisms (rs3134940, rs1800625, rs184003 and rs1554139845) are associated with albuminuria in black South Africans with T2D.

Methods: Participants were classified into two groups based on a urine albumin:creatinine ratio (UACR): normoalbuminuria (UACR < 3 mg/mmol, $n = 141$) and albuminuria (UACR ≥ 3 mg/mmol, $n = 147$). Participants were genotyped for the rs1554139845 insertion/deletion by PCR, rs1800625 and rs184003 by PCR-restriction fragment length polymorphism and rs3134940 by TaqMan assay. sRAGE concentrations were measured by ELISA.

Results: None of the AGER gene polymorphisms were associated with albuminuria in univariate analysis. Participants homozygous for the rs1554139845 insertion allele had RAGE concentrations 1774ng/mL higher than those with the deletion allele ($p = 0.003$). In multivariate analysis systolic blood pressure ($\beta = 0.009$; $p < 0.001$), HbA1c ($\beta = 0.047$; $p = 0.004$) and sRAGE concentrations ($\beta = 0.00002$; $p = 0.042$) were associated with increased UACR.

Conclusion: Our results do not support the previously reported hypothesis of protection from microvascular complications mediated by increased sRAGE levels which acts as a decoy receptor for proinflammatory AGEs, reducing AGE-RAGE signalling. Increased sRAGE may be due to decreased renal clearance as a result of decreased kidney function in the albuminuria group. Further studies are necessary to understand

the mechanisms underlying the association between sRAGE and kidney dysfunction.

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The effect of the 14:10-hour time-restricted feeding (TRF) regimen on selected markers of glucose homeostasis in diet-induced prediabetic male Sprague Dawley rats

Category: Basic Science

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Background: Prediabetes is a condition that often precedes the onset of type 2 diabetes mellitus (T2DM). Literature evidence indicates that prediabetes is reversible, making it an important therapeutic target for preventing the progression to T2DM. Several studies have investigated intermittent fasting as a possible method to manage or treat prediabetes. This study evaluated the impact of a 14:10-hour time-restricted feeding (TRF) regimen on leptin concentration, insulin sensitivity and selected markers associated with the insulin signalling pathway and glucose homeostasis in diet-induced prediabetic rats.

Methods: Twenty-four male Sprague Dawley rats were obtained and randomly divided into two dietary groups: group 1 ($n = 6$) received a standard diet and water, while group 2 ($n = 18$) was provided a high-fat, high-carbohydrate (HFHC) diet supplemented with 15% fructose for a period of 20 weeks to induce prediabetes. After confirming prediabetes, an intermittent fasting (IF) regimen was assigned to the rats, while also having untreated and metformin-treated prediabetic rats serving as controls.

Results: Both IF and HFHC-Met groups yield significantly lower blood glucose, leptin and BMI results compared to the prediabetic group. The IF group yielded significantly lower insulin, HOMA-IR and HbA1C than both controls.

Conclusion: The study showed the potential of IF in alleviating prediabetes-induced dysregulation of glucose homeostasis and therefore warrants further investigations into its use in the management of prediabetes.

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Ethnic differences in chromogranin A levels in normoglycaemic black and white South African women

Category: Basic Science

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Background: Chromogranin A (CgA) is a secretory peptide of neuroendocrine cells and in a previous study we showed that in black women it correlated negatively with insulin resistance (IR) and positively with hepatic insulin clearance (HIC). Since ethnic disparities in IR have been reported, we aimed to compare CgA levels between white women and the black women from our previous study and determine if the CgA correlations observed in that study were also observed in white women.

Methods: Using convenience sampling, 67 black and 54 white pre-menopausal women were recruited. Anthropometric measurements were recorded and fasting and 30-minute blood samples from an oral glucose tolerance test were used for the measurement of glucose, insulin, C-peptide (Roche automated system) and CgA (Beckman ELISA). Insulin resistance was calculated using the HOMA equation and HIC was assessed using the fasting C-peptide/insulin ratio. All statistical tests were adjusted for age and BMI.

Results: Black women had significantly lower fasting glucose (4.7 ± 0.3 vs. 4.8 ± 0.3 mmol/L; $p = 0.013$) and 30-minute glucose (6.3 (5.3; 7.0) vs. 7.3 (7.0; 8.4) mmol/L; $p = 0.018$) but higher fasting CgA (55.9 ± 20.0 vs. 51.0 ± 15.2 ng/mL; $p = 0.002$) compared to white women. No significant differences in insulin and IR were found between the groups and no significant associations of CgA with glucose, IR and HIC were observed in white women.

Conclusion: This is the first study to show ethnic differences in CgA levels and to demonstrate differential associations of this peptide with glucose and insulin dynamics in black and white women.

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Maternal circulating microRNAs: potential biomarkers for glycaemic control and macrosomia in pregnant South African women

Category: Basic Science

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Background: Poor maternal glucose control and macrosomia (> 4 kg) are linked to metabolic and developmental complications in infants. Early prediction of these adverse outcomes is important for risk stratification and targeted intervention. Circulating miRNAs have emerged as potential biomarkers for pregnancy complications. This study investigated the association between maternal circulating miRNAs, glucose control, and macrosomia.

Methods: A prospective cohort study was conducted at Steve Biko Academic Hospital, Pretoria, South Africa between 2017 and 2023. The study included 232 high-risk pregnant women with normoglycaemia ($n = 69$), type 1 diabetes (T1DM) ($n = 27$), type 2 diabetes (T2DM) ($n = 78$), and gestational diabetes (GDM) ($n = 58$). Circulating miRNAs ($n = 12$) were profiled using quantitative real-time PCR, whereafter the association between miRNAs and pregnancy outcomes were explored using logistic regression and receiver operating characteristic (ROC) curve analysis.

Results: Lower miR-222-3p levels were associated with a 1.3 x increased odds ($p = 0.041$) of poor glycaemic control, with a ROC area under the curve (AUC) value of 0.616 (0.508-0.723). Higher miR-210-3p levels were associated with a 1.3 x increased odds ($p = 0.050$) of macrosomia and with ROC AUC value of 0.756 (0.618-0.894). None of the other miRNAs showed a significant association with glucose control or macrosomia.

Conclusion: Maternal circulating miRNAs are associated with glycaemic control and macrosomia, highlighting their potential as predictive biomarkers. Further validation in larger, diverse populations is required.