

First Anatomy Annual Congress in Rwanda - October 13 – 15, 2022

SOCIETY OF CLINICAL ANATOMY OF RWANDA (S-CAR)

Theme: Promoting anatomy to enlighten safe and effective clinical practice

It is with a greater honor that I welcome you to this Anatomy Annual Congress, the first of its kind in Rwanda. Anatomy is an essential fundamental science in medical education and medical practice and it deserve to be vibrant scientifically. The S-CAR have been founded with the aim of growing the anatomy sciences and this congress is a wonderful outcome of this common commitment. The congress has 4 events that include: a pre-conference workshop on the peripheral nervous system, the S-CAR annual congress, the scientific conference and the world anatomy day (WAD).

Reinforcing the importance of the PNS, Dr. David HAKIZIMANA, a Senior Consultant Neurosurgeon wrote this, I quote: “Peripheral nerve surgery is used to improve function and minimize pain and disability in people with peripheral nerve disorders, such as acute nerve injuries, entrapment neuropathies, and nerve sheath tumors. It involves rerouting healthy nerves to take over the function of the nerves affected by injury, disease, or condition. Surgical treatment for peripheral nerve injuries involves a team which may include: neurosurgeons, plastic surgeons, orthopedic surgeons. Globally the status of peripheral nerve surgery practice within the global landscape of surgery has long been in the shadow of the more prominent areas. The reasons are many, one of them plausibly being the conceptual frame of the very word “peripheral”, which evoke the notions of marginality and lesser importance especially for neurosurgeons. Some of the related common misconceptions are that neurological deficit in peripheral nerve injury is permanent and irreversible, that peripheral nerves do not have the ability to regenerate, that the results of surgical treatment are insignificant. In Rwanda and Africa in general peripheral nerve surgery in almost non-existing or at embryonic phase at best. Although peripheral nerve surgery is not a life-saving surgery, it has been proved to be a life-changing surgery, with a major impact on the quality of patient’s life, as it improves the patient’s ability to perform every day and professional activities and thus affects his/her physical and psychological well-being. Moreover, since most patients with peripheral nerve injuries and brachial plexus injuries belong to the working-age population, peripheral nerve surgery also has substantial socioeconomic implications. Contrary to the previously held view, the peripheral nerve system has been shown to have a huge regeneration potential, with significant results enhanced by different modalities of stimulation, whereby recent research on brain plasticity indicates that experience-dependent reorganization of neural networks plays an important role in functional recovery. For all these reasons, systematic research, education, and practice in peripheral nerve surgery is definitely worth the effort. The aim of this course will be to train residents and interested surgeons from Rwanda in peripheral nerve surgery skills”.

The rich scientific conference program with 37 presentations subdivided in sessions on medical education, congenital defects, anatomy and anatomical variations, neurosciences, free presentations, closure lecture, scientific forum for PhD and MSC candidates, cadavers for education and research will give to you an excellent experience. On behalf of S-CAR, I am grateful to the sponsors (MoH, UR, UGHE, AUCA-ASOME, Operation Smile, CHUK and MMI).

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A1 - Anatomy of the “Lubendorff Bridge” in the Tessier craniofacial cleft wars

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ABSTRACT

INTRODUCTION: The defects found in Tessier clefts come in various forms in different patients. These variations have to a great extent affected not only documentation of these craniofacial defects but invariably their treatment and communication amongst craniofacial researchers. This study has not only documented the clinical presentation of these clefts in a South African population but also documented the skeletal defects present in Tessier numbers 3 and 4 using anthropometric measurements to generate a sub-classification.

METHODS: The records of 8 patients, who had been treated for either Tessier clefts number 3 or 4 between 2003 and 2017, were reviewed and compared with 16 studies pulled from the literature systematically. Then 7 computed tomography scans of patients who had been treated for Tessier 3 and 4 clefts also were analyzed. Measurements of the expected defects in each cleft taken and compared with unaffected side as the reference. Emerging patterns of their analysis was then used to generate a sub-classification for these clefts.

RESULTS: The anatomical and clinical presentation of the patients were compared to the reviewed literature and the different parameters were documented. In addition, associated clefts were also recorded in the study—it was noted that the association pattern recorded in Tessier cleft number 4 in this study did not conform to its traditional counterpart. The presence or absence of an alveolar cleft, the emerging patterns of comparison of the measurements of the maxilla and the orbits of the cleft side and the non-cleft side as well as absence of the bone were used to arrive at a sub-classification system using (a), (b), (c), (M+ O+), (M- O-), and (0).

CONCLUSION: Study concluded that the clinical presentations of these clefts, however variable, seem to have a similar presentation worldwide. Additionally, associated clefts do not conform to the original Tessier classification system and therefore it is imperative for these patterns to be clearly mapped out. The study also recommends a sub-classification for Tessier clefts numbers 3 and 4 that will allow physicians anticipate the extent and the form of skeletal defects present before even seeing the patient.

A2 - Ultrasound diagnosis of fetal hydrocephalus: Anatomical ramifications of a case report

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ABSTRACT

INTRODUCTION: Congenital hydrocephalus is a common anomaly of the Central Nervous System characterized by excess cerebrospinal fluid (CSF) in the ventricular system of the brain due to disruption, synthesis or overproduction leading to imbalance and varied neuro-developmental outcomes. Congenital ventricular dilatation can be diagnosed by prenatal sonar; with measurements of a single unilateral cerebral ventricle (at the level of the cavum septum pellucidum) appearing >10mm. Literature classifies acute/ severe dilatation > 14.5mm, moderate > 13mm and mild conditions between 10 – 13mm with frequent debates among experts depending on the radiological modality used.

METHODS: We report the case of 35-year-old gravidae (parity 2) referred to our facility for routine antenatal screening scan at 22 weeks + 6 days' gestational age. Coincidental embryologic anomaly was observed at the 2nd trimester using a 3.5 MHz General Electric (GE) Volusion ultrasound machine with a curvilinear transducer after an abdomino-pelvic ultrasound session.

RESULTS: Cranial sonographic exposure demonstrated severe bilateral hydrocephalus measuring 29.8mm at the coronal and transverse planes. Enlargement of dual lateral ventricles with anechoic gap and RT/LT regional comparison revealed excess fluid in the fetal cerebral hemisphere. Liquor amnii was adequate and clear with no other compromise seen, extra-cranial Biophysical Profile, heart rate and locomotor kinesis appeared normal.

CONCLUSION: Precise measurement of the ventricles is of vital importance in prenatal screening. Counselling of mothers may be difficult in unfavorable outcomes (if unresolved at the onset of the third trimester), status of resulting handicap after parturition is well known.

A3 - Assessment of relationship between clinical manifestation of Chiari Malformation type 1 and measurement of cerebellar tonsil within the foramen magnum

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ABSTRACT

INTRODUCTION: Chiari malformation type I (CM I) is a common condition. It is also a subject of controversy from diagnosis to the management. Classically the diagnosis is made on clinical basis and radiological measurement of cerebellar tonsils herniation of 5mm or more below the opisthion-basion line in mid-sagittal plane (Mc Rae line.) The aim of our study was to determine the relationship between clinical presentation of Chiari malformation type I and cerebellar tonsil herniation measured in 3 dimensions, cerebellar tonsils volume and the volume ratio (cerebellar tonsils volume/Foramen magnum volume) within foramen magnum.

METHODS: We conducted an observational cross sectional analytical study. Patients with clinical and radiological confirmation of Chiari malformation type I evaluated on cranial cervical MRI were enrolled. Three-dimension morphometric measures of cerebellar tonsils were made; the volume of cerebellar tonsils was calculated using ellipsoid volume formula. The transverse diameters of foramen magnum were measured and the volume of foramen magnum was calculated using sphere formula.

RESULTS: Chiari malformation type I was more common in female with 61.5% and male patients with CM I was 38.5%. The majority of patients with chiari I malformation in our study was in fourth and fifth decade. Occipital headache or neck pain was the most presenting symptom in our study population with 100% occurrence followed by limb paresthesia, vertigo, difficulty walking and bulbar symptoms which was found in 95%, 55%, 7% and 17% respectively in our study population.

There was a correlation between headache severity and sagittal measurement as we failed to reject hypothesis ($p=0.661$, Spearman's correlation coefficient: -0.045).

In contrast there was a correlation between headache severity and cerebellar tonsils volume as well as T/F volume ratio with P- value 0.03 in our study.

CONCLUSION: Two dimensions' radiological measurements in assessment of chiari malformation type I is not reflecting the clinical severity of patients with CM I. Consideration of both clinical presentation and radiological measures in assessment of severity of CM I is of great importance rather than only considering the cut off 5 mm descent of cerebellar tonsils herniation in midsagittal measurement

A4 - Anatomy dissection course to endoscopic skull base surgery

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ABSTRACT

INTRODUCTION: Endoscopic Skull Base Surgery is a form of minimally invasive surgery to correct several different conditions affecting the skull base. It uses natural body openings (in this case primarily the nose, but sometimes also the mouth) to insert an endoscope, and surgical instruments. The availability of endoscopic endonasal approaches is limited in Africa due to logistic and skills related factors. To close this surgery accessibility, gap the Rwanda neurosurgical center organized the first endoscopic endonasal neuroanatomy course in January 2020. This study aimed at looking back at impact of this course on practice of endoscopic skull base surgery in Rwanda.

METHODS: We retrospectively looked at the surgeons who participated in the course, the number of surgeons who introduced endoscopic skull base surgery in their practice. We also did a retrospective analysis demographic data, diagnosis, immediate outcome, and 3 months' outcome of patients who underwent endoscopic skull base surgery.

RESULTS: Six neurosurgeons, two ENT surgeons and two senior neurosurgical residents participated in the endoscopic endonasal neuroanatomy cadaver dissection from 20 to 23 of January 2020. Within 12 months 4 (50%) surgeons introduced endoscopic endonasal surgery in their practice. Since April 2020, 33 patients underwent EETS, 27 (83 %) patients had pituitary adenomas, 3 patients had craniopharyngiomas (10%), 1 tuberculom sellae meningioma, 1 post surgery CSF leak and 1 hypothalamus astrocytoma. Their mean age was 42.3, males were 14, females were 18. Visual dysfunction was the common presentation 29 (87.8%), 4 (12.2%) patients had endocrinological dysfunction without visual symptoms. Gross total resection was achieved for 24 patients; only partial resection was achieved in 9 patients. At 3 months follow up, 3 (9%) patients had died, 1 patient had post-operative hemiplegia, 4 (12.1%) patients did not have endocrinological or visual improvement, 25 (75%) had improved or full recovery of visual and hormonal function.

CONCLUSION: The endoscopic endonasal skull base neuroanatomy course held in Kigali in 2021 January brought additional option in armamentarium of neurosurgeons in Rwanda, prevented 33 referrals abroad in a period of 30 months.

A5 - The Analysis of anatomical content in surgical notes using Case Anatomical Knowledge Index (CAKI). A mixed method study

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ABSTRACT

INTRODUCTION: Knowledge of anatomy is fundamental for medical training and practice especially in surgery. Surgical notes writing is part of the core surgical skills. However, there is huge variability of anatomy details for most common procedures in CHUK among surgeons and surgical trainees.

METHODS: This was a mixed-methods study with sequential explanatory design. Quantitative data were collected and analyzed in the first place using CAKI scoring tool and a pre-established 5-point Likert Scale questionnaire. Based on quantitative findings, qualitative, open-ended questions were developed and asked to participants through individual face-to-face in-depth interviews to explore perceptions of surgeons and surgical trainees.

RESULTS: 119 patients' files were assessed, 5 surgeons and 15 surgical trainees interviewed. 46.2% files accounted for gallbladder surgery, 44.5% and 9.2% for hernia and thyroid respectively. 52% of patients were females. The majority of surgical notes (89.9%) were done by residents. The mean overall total score of anatomical content using CAKI score was average (11.9/15). The type of disease ($p < 0.001$) and the surgical procedure ($p < 0.001$) have been identified as factors influencing the quality of anatomy in surgical notes. The majority of surgeons and trainees feel that the lack of adequate knowledge of surgical anatomy, heavy workload and lack of consideration to recording of anatomy as well as lack of mentorship and training to properly record the anatomy have a negative impact on the quality of anatomy recorded in surgical notes.

CONCLUSION: The content of anatomy in surgical notes is average. It is influenced by the type of disease, the surgical procedure and level of expertise of the notes taker. An increased awareness among surgeons and surgical trainees, better documentation and continued anatomy integration in surgical practice may improve the quality and quantity of the anatomy content in surgical notes.

A6 - Superior mesenteric artery branching variations

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ABSTRACT

INTRODUCTION: The superior mesenteric artery (SMA), an impaired visceral branch of the abdominal aorta, supplies an important party of the gastrointestinal tract. It exclusively supplies the jejunum, ileum, cecum, ascending colon and 2/3 of the transverse colon. It contributes to the supply of the pancreaticoduodenal complex and in certain cases may supplement the supply of the left colon through the arc of Riolan. Anatomical variations of the SMA may arise from its origin in the celiac artery or from the common hepatic artery or from its branching patterns. Here we present cases of SMA branching patterns observed during an infra-colonic compartment dissection session.

METHODS: This a case series from a cadaver dissection. Cadavers had been displayed in spine position. An inverse Y anatomical incision with 2 incisions from the midline supra umbilical to Anterior Superior Iliac Spine (ASIS) and supra-umbilical midline incisions allowed exposing the abdominal cavity. The SMA was dissected form it origin.

RESULTS: Four SMA branching patterns are described. In the first case, there is a classically described branching of the SMA. In the second case, there is a common trunk for the right colic artery and the ileocolic artery, which we named colo-ileocolic artery. In the third case, there is a common trunk for the right colic artery and middle colic artery. In the fourth, the middle colic artery emerges from the posterior side of the SMA

CONCLUSION: In right hemicolectomy for malignancies, it is important that arteries are severed at the roots to allow a better lymph nodes resection. The pattern of the SMA branching can make it much easier or harder. Surgeons should be aware of various branching of the SMA and if possible, have angiogram as a preoperative planning tool.

A7 - Unusual anatomical variations of the hepatic arteries and the bile duct: What are the surgical implications?

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ABSTRACT

INTRODUCTION: The knowledge of anatomy is essential for surgical safety and impacts positively on patients' outcomes. Surgeons operating on the liver and bile ducts should keep in mind the normal anatomy and its variations as the latter are common.

METHODS: We conducted a structured surgical dissection course of the supra-colic compartment of the abdominal cavity on 2nd and 3rd October 2020. While dissecting a 46-years-old male cadaver, we encountered unusual anatomical variations of the hepatic arteries branching, the biliary tree, and arterial supply to the common bile duct.

RESULTS: The common hepatic artery was dividing into two branches: a common short trunk for the left hepatic artery and the right gastric artery (hepato-gastric trunk) and a common trunk for the right hepatic artery and gastroduodenal artery (hepato-gastroduodenal trunk). The right hepatic duct was duplicated with a main right hepatic duct and an additional smaller duct. The bile duct was supplied by an artery coming from the abdominal aorta.

CONCLUSION: We described three unusual anatomical variations: a variation of the hepatic arteries branching pattern, a bile duct branching variant, and blood supply to the bile duct from the abdominal aorta. Surgeons should be aware of these rare variations in order to properly identify structures during surgery and prevent iatrogenic injuries that can lead to major complications.

A8 - Factors affecting quality of life post lower limbs amputations – A multicenter cross-sectional study in Rwanda

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ABSTRACT

INTRODUCTION: Most of lower limb amputations performed are due to peripheral vascular diseases and trauma, mostly in middle- and lower-income countries. Quality of life post lower limb amputations as outcome is important and the cognition of what affects it is vital for its promotion. The objectives of this research are to determine the quality-of-life post lower limb amputation (LLA) and its modifiable associated factors.

METHODS: Cross-sectional study involving lower limbs amputees aged from 15 years and above, attending University teaching hospital of Kigali (CHUK) and University teaching hospital of Butare (CHUB) surgical outpatient clinic and physiotherapy, were assessed, by using the health questionnaire (EQ-5D) for the measurement of quality of life, and factors associated with it were on a structured questionnaire.

RESULTS: Among 126 participants, male were 72.2% (n=91) and female were 27.8% (n=35) with the mean age of 45years. Low level of education and socio-economic status were predominant. Trauma 39.7% (50), was the leading indication of LLA followed by peripheral vascular diseases 27% (34), tumors with 11.9% (15) and diabetic foot with 8.7% (11). Major amputations, 93.7 % (118), were mostly done, and they were amongst factors influencing the QoL, particularly the mobility aspect (p-value: 0.03). Amongst all aspects of QoL, mobility aspect was the most affected. 92.9% were having problems of walking in different degree of severity, with 54.7 % (n=69) who had severe problem in walking). In usual self-care, 50% (n=63) reported not to have any problem in usual self-care, whereas the other half reported with problems in usual self-care in different degree of severity. The 27% reported no problem in performing usual activities whereas 73 % presented problems of doing usual activities in different levels of severity.

CONCLUSION: The burden of LLA affect different domain of QoL and different factors play role in poor QoL after LLA. Appropriate prevention of RTA, management and control of PVD, DM and perioperative psychological support and provision of walking device would result in the diminution of amputation rate and postoperative management of LLA sequelae.

A9 - Effect of ethanol, cannabis and nicotine on the brain (Hippocampus) of adult wistar rats

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ABSTRACT

INTRODUCTION: Administration of ethanol, cannabis and nicotine are associated with changes in the structure and functions of the brain especially with consistent reports of cognitive deficit. This study aimed at studying the effects of these substances on the CA1 region of the hippocampus of adult Wistar rat.

METHODS: A total number of 50 adult male Wistar rats were used for this study. Group A (Control), B (Ethanol Only), C (Cannabis only), D (Nicotine Only) and E (Ethanol + Cannabis + Nicotine). Treatment lasted for 14 days, the neurobehavioral tests conducted were elevated plus maze and radial arm test. Animals were sacrificed by perfusion and cervical dislocation, the brain was grossed anatomically before undergoing morphological and biochemical analysis to assay for Dopamine, Acetylcholine and GABA (Gamma Amino-butyric Acid), G6PDH (Glucose-6-Phosphate dehydrogenase) and Cytochrome-c-oxidase, general histological demonstration of the hippocampus by H and E staining and immunohistochemically by GFAP (Glial Fibrillary Acidic Protein).

RESULTS: The results showed interference in neurotransmitter levels and alterations in CA1 cell morphology indicating disruption in neural activities. There was significant increase in Gamma Amino-Butyric Acid (GABA) levels in the groups treated with ethanol and a combined dosage when compared with the control group and a general increase in acetylcholine levels in treated groups when compared with the control group. Glucose-6-phosphate dehydrogenase (G6PDH) levels in groups treated with cannabis, nicotine and a combined dosage showed significant increase when compared with the control group, where the group treated with nicotine showed especially high G6PDH level indicating oxidative stress.

Behaviorally, animals administered ethanol showed higher anxiety levels, while those treated with cannabis, nicotine and a combined dosage showed lower anxiety levels with reference memory error, ethanol's depressant effect as observed in its ability to increase anxiety levels is due to its effect on inhibitory neurotransmitter (GABA).

CONCLUSION: This research work revealed that these substances cause mitochondrial dysfunction, mood disorders, oxidative stress and neuronal damage in the hippocampus of the brain, continuous use will cause chronic toxicity on the brain, considerably on the hippocampus leading to difficulty in cognitive functions and memory.

A10 - Prolonged Codiene administration causes degeneration of myelinated axons and motor dysfunction in Wistar rats.

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ABSTRACT

INTRODUCTION: Over-the-counter (OTC) anti-cough medications which contain codeine (an opioid) are extensively available in Nigeria, and hence prone to overuse or abuse. The study aimed to understand the effects of oral codeine administration on the integrity of neurons of the cerebral cortex and cerebellum of male Wistar rats.

METHODS: Thirty adult male Wistar rats of comparable weights were obtained and randomly allocated into 5 groups: A, B, C, D, and E (n=6). Drugs used for the study were ArchilinTM with codeine and Dihydrocodeine 30mg. Group A served as control and was administered 0.5ml/kg of normal saline. Groups B and C were treated with 1mg/kg and 2mg/kg of dihydrocodeine respectively; Group D and E received 2ml/kg and 4ml/kg of ArchilinTM codeine syrup respectively. The experimental animals were subjected to neurobehavioral studies using beam walk and open field. At the end of the treatment period, the animals were anesthetized with ketamine-hydrochloride intraperitoneally. The brains were quickly dissected out, rinsed with normal saline, and tissue processed for myelin studies.

RESULTS: The result of the beam walking and open field revealed that prolonged codeine administration interfered with motor function in the experimental animals. The treatment groups showed decreased line crossing frequency in the Open field test compared to the control. The beam walking test revealed decreased line crossing frequency in groups C, D, and E compared to the control. There was an increased frequency of foot slips reported in group E. Sections of the cerebral cortex and cerebellum of rats given normal saline showed normal myelin sheaths, whereas animals in the treatment group showed degenerating myelin compared to the control.

CONCLUSION: Prolonged consumption of prescription codeine causes degeneration of the myelin sheaths and this may affect the conduction of electrical impulses in myelinated axons thus resulting in motor function insufficiency. The Codeine syrup group showed severe symptoms of cortical lesion compared to the dihydrocodeine group.

A11 - Epileptogenesis phases investigation: Hippocampal morphology and function in rat model of lithium chloride pilocarpine-induced epilepsy

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ABSTRACT

INTRODUCTION: Hippocampal-mediated functions and structure were investigated in a lithium-chloride pilocarpine rat model during the acute, latent, and chronic phases of epileptogenesis and also proper understanding of the events occurring at the different phases of epileptogenesis is essential for development of potential therapeutic agents. Hence, why this study was conducted.

METHODS: Forty-eight male Wistar rats weighing (80-120 g) were utilized and randomly assigned into groups A-D (n= 12 each). Neurobehavioral assessments (open field and radial arm maze tests) were conducted. Rats for biochemical assays were sacrificed by cervical dislocation while rats for histology and immunohistochemistry were transcardially perfused with normal saline and 10% neutral buffered formalin. H and E stain was used for investigation of the hippocampal structure while GFAP expression was used to evaluate astrocytic function. Glutamate, Gamma Aminobutyric Acid (GABA) and Tumor Necrosis Factor- α levels and Glutamate Decarboxylase (GAD) activity were assayed.

RESULTS: Significant decrease in exploratory activities and impairment in memory across all groups compared to control. Neurotransmitter levels were slightly altered. Histological results showed evidence of neuronal degeneration in the acute, latent and chronic phases compared to the control group. Astrogliosis was more prominent at the chronic phase (Group D) of epileptogenesis.

CONCLUSION: Conclusively, there was impairment in memory and neurodegeneration which was a feature of all phases of epileptogenesis, while astrogliosis was more pronounced at the chronic phase of epileptogenesis. Even though the activity of GAD was increased, however not significantly, GABA and glutamate levels were slightly altered.

A12 - Neurodegenerative defects in diet induced Alzheimer-like deficits in insulin resistant rats

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ABSTRACT

INTRODUCTION: A rodent model of insulin resistance was employed to ascertain previously reported metabolic neurodegenerative changes associated with hyperglycemia and accompanying hyperinsulinemia consistent with type 2 diabetes mellitus. Curcumin from the spice turmeric was the candidate therapy tested for its possible ameliorative benefits.

METHODS: 36 male rats of the Wistar strain were randomized into six groups and treated as follows: olive oil for control; 200mg/kg bw curcumin for curcumin group; HFD plus three doses 40 mg/kgbw of STZ for the diabetic group; HFD, three doses of STZ and concurrent treatment with curcumin for the protective group; pre-treatment with curcumin, followed by HFD and three doses of STZ for preventive; and lastly HFD, three doses of STZ followed by curcumin for the therapeutic group. Fasting blood glucose was measured with a glucometer; cortical and hippocampal sections were stained for histomorphological investigations. ELISA was used for quantifying PI3K, AKT and GSK3 β . Data was analyzed using one-way ANOVA and Turkey's post hoc test.

RESULTS: Our findings revealed that oral curcumin corrected hyperglycemia and reduced insulin resistance. It further show that insulin resistance was connected with neuronal pyknosis, chromatolysis, atrophy and related deficits in the rat model, while curcumin ameliorated these changes; reduced the expressions of A β plaques in rodent brains; plus it reversed impaired signaling of PI3K, AKT and GSK-3 β .

CONCLUSION: The study concluded that oral curcumin showed ameliorative potentials against prevailing neuronal death associated with Alzheimer's-like deficits and insulin resistance. Curcumin should therefore offer some benefits to demented patients with underlying insulin resistance.

A13 - Anatomical Evaluation of the neuroprotective potentials of Trans-cinnamaldehyde in a rat model of insulin-resistant

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ABSTRACT

INTRODUCTION: The incidence of insulin-resistance is on the increase globally. Earlier reports linked impaired insulin signaling and glucose intolerance to cognitive decline, suggesting that improving insulin signaling could enhance neuronal survival. Trans-cinnamaldehyde (TCA) is an active component of cinnamon and it has many pharmacological importance. However, the effects of TCA on insulin resistance-induced neurodegenerative changes are unclear. This study therefore aimed at evaluating the effects of trans-cinnamaldehyde on hippocampal histomorphology in insulin-resistant rats.

METHODS: In the present study, we investigated the neuroprotective effects of trans-cinnamaldehyde on the hippocampus of insulin-resistant rats. Twenty adult Wistar rats were fed with HFD for 8 weeks and then injected with a low dose of STZ (30 mg/kg body weight intraperitoneally). 60mg/kg of Trans-cinnamaldehyde was orally administered for 4 weeks once daily. Histological and immunohistochemical techniques were used to investigate the ameliorative potentials of TCA on the hippocampus of Wistar Rats.

RESULTS: TCA administration to insulin-resistant rats histologically and immunohistochemically reduced pyknosis, astrogliosis, and neurodegenerative changes in the hippocampus when compared with untreated insulin-resistant rats.

CONCLUSION: TCA prospect as a novel therapy in insulin-resistant subjects with neurogenerative diseases could be further explored.

A14 - Microscopic Assessments of Phoenix dactylifera L. Effect in a Rat Model of Mercury-Triggered Cerebral M1 Changes.

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ABSTRACT

INTRODUCTION: Mercury is a widespread environmental and industrial pollutant with toxic effects on vital organs. The cerebrum, composed of cortical areas such as the primary motor cortex (M1), is a vulnerable target of mercury toxicity within the central nervous system. Phoenix dactylifera is used in folk medicine to treat various disorders, such as loss of consciousness, memory disturbances, and nervous disorders. This study microscopically evaluated the neuroprotective effect of aqueous fruit pulp extract of *P. dactylifera* (AFPD) on mercury-triggered M1 changes in Wistar rats.

METHODS: Twenty-four Wistar rats were divided into six groups (I–VI; n = 4). Group I was administered distilled water (2 ml/kg); Group II administered mercuric chloride (MCL, 5 mg/kg); Group III administered Vitamin C (100 mg/kg) + MCL (5 mg/kg); Groups IV, V, and VI were administered AFPD (250 mg/kg, 500 mg/kg, and 1000 mg/kg, respectively) followed by MCL (5 mg/kg). The neuroprotective property was evaluated by microscopic assessment of the M1 region applying histological techniques and Analysis of histometric features of M1 neurons. Statistical Analysis Used: One-way ANOVA and paired sample t-test were used.

RESULTS: Microscopic examination of MCL-treated cerebral sections revealed M1 histoarchitectural distortion and neurodegenerative changes such as pyknosis, neuronal shrinkage, chromatolysis, loss of pyramidal neurites, and altered Nissl substance reactivity relative to the control. Administration of AFPD remarkably ameliorated MCL triggered M1 changes, especially at a dose of 500 mg/kg with neuroprotective properties comparable to the reference drug, Vitamin C.

CONCLUSION: AFPD is potentially efficacious in ameliorating mercury-triggered microscopic alterations in the M1 region of Wistar rats. The neuroprotective property of AFPD could be attributed to the antioxidant properties of constituent phytochemicals

A15 - Ameliorative potential of coconut oil and lauric acid on sperm quality and testicular function in diabetic male Wistar rats

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ABSTRACT

INTRODUCTION: Diabetes mellitus is often associated with testicular dysfunction and impaired sperm quality. Coconut oil (CO) which is widely consumed in the tropics, has been proven to possess anti-diabetic properties and also mitigates testicular dysfunction. Lauric acid (LA), being the most abundant constituent of CO is hypothetically proposed to be responsible for its therapeutic properties. This study thus sought to evaluate the potential ameliorative effects of CO and LA on sperm and testicular dysfunction in diabetic male rats.

METHODS: The rats were divided into 6 groups. Group I (NC): normal control; Group II (DUT): diabetic untreated; Groups III (LA90), IV (LA180) and V (LA360): diabetic groups treated with LA at 90, 180 and 360 mg/kg body weight respectively; and Group VI (DCO): diabetic treated with coconut oil. Diabetes was induced by an intraperitoneal injection of streptozotocin. All treatments were given by oral gavage for 4 weeks, then the final body weight of the rats was measured before they were euthanized. Testis weight, semen analysis, testosterone assay, testicular histology were then carried out.

RESULTS: The results showed a significant decline ($p < 0.05$) in gonadosomatic index, testosterone level and sperm parameters in DUT compared to NC. Gonadosomatic index and sperm parameters were significantly ($p < 0.05$) improved in DCO compared to DUT. Compared to DUT; progressive motile sperm cells were significantly ($p < 0.05$) increased in LA90 and normal sperm cells were significantly ($p < 0.05$) increased in LA90 and LA360 respectively. Testicular histology showed degradation in DUT and was considerably improved in LA360 and DCO.

CONCLUSION: Treatment with CO showed better improvement in sperm quality than LA in diabetic rats. However, appreciable improvement of the testicular histology and some sperm parameters by LA shows promising therapeutic potential.

A16 - Pulmonary status of Diabetes Mellitus subjects: A call for concern

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ABSTRACT

INTRODUCTION: Despite various reported multi-organ complications associated with diabetes mellitus (DM), pulmonary complications of DM have been poorly characterized in spite of some imminent underlying consequences. This study therefore assessed lung function of DM subjects with the aim of establishing possible threatening and pathophysiological mechanism(s) which could explain any such pulmonary dysfunction.

METHODS: A total of sixty-four (64) female subjects consisting of 32 control and 32 DM subjects were used for this study. Forced vital capacity, forced expiratory volume in one second, percentage of forced expiratory volume in one second and peak expiratory flow rate were lung function indices measured. These indices were measured using Schiller spiromit SP-1 Spirometer. Other related parameters measured were; Fasting blood sugar, glycated haemoglobin, β -hydroxybutyric acid, serum electrolytes (HCO₃⁻ and K⁺), oxygen saturation, oxygen content of blood, haemoglobin concentration and surfactant protein A.

RESULTS: From the results, there was no significant difference in the anthropometric indices between DM and non-DM (Control) subjects. FEV₁, FEV₁% and HCO₃⁻ were significantly decreased ($P < 0.05$) in DM subjects when compared to control. SPO₂, O₂ content and Hb concentration were all significantly reduced ($P < 0.05$) in DM subjects when compared to control. BHBA, HbA_{1c}, SP-A were all significantly raised ($P < 0.05$) in DM subjects when compared to control. There was a strong positive and significant correlation ($P = 0.000$) between HbA_{1c} and SP-A. There was a strong negative and significant correlation ($P = 0.001$) between oxygen content and SP-A. A negative correlation was seen between oxygen saturation and SP-A. Same trend was seen for FEV₁ % and SP-A. There was a negative correlation between duration of DM and FVC. There was a negative correlation between duration of DM and SP-A. In this study, most DM patients recruited were poorly controlled as seen in their HbA_{1c} values above 6.8%.

CONCLUSION: This study revealed a reduction in some lung function indices such as FEV₁, FEV₁%, SPO₂, O₂ content of blood as well as changes in related parameters (SP-A, BHBA, HBA_{1c}, HCO₃⁻). These changes in pulmonary indices and some related parameters calls for concern on regular monitoring of lung function status of diabetic patients.

A17 - Inhibition of Hypertension by Potassium adaptation in Sprague Dawley rats treated with high salt diet – a potential mechanism for blood pressure regulation

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ABSTRACT

INTRODUCTION: There is an increasing prevalence of hypertension all over the world and dietary salt intake has been inextricably linked as its risk factor. The critical role of potassium in blood pressure regulation has also been severally reported. Associating potassium adaptation with high blood pressure development especially with high salt diet has been scarcely reported and that form the basis of this study. We therefore aimed at defining the role of potassium adaptation in the development of salt –induced hypertension in Sprague Dawley rats.

METHODS: This study was divided into two phases viz: the induction and confirmation of hypertension and the effect of potassium adaptation. The rats were divided into two groups of control and test. The test group received high salt diet (8% NaCl) for 6 weeks while the control animals were fed with standard rat chow and given water ad libitum. Phase II comprised of pre-treated animals with KCl before induction of hypertension and post induction treatment group with KCl. Blood pressures were monitored as well as blood samples taken for analysis of the gene expressions of I-CAM-1 and PSGL-1 as well as an inflammatory marker (Hs-CRP) in the test animals and controls.

RESULTS: We observed a spontaneous significant increase in the blood pressures of the test animals as from the 4th week compared with the control ($P < .05$, respectively), the potassium –adapted group and KCl post treated groups exhibited relatively stable blood pressure compared with the control. There were significant increases in the levels of Hs-CRP in all the test groups compared with control and in the expression of PSGL-1 in all the test groups ($P < 0.05$), though lower in the potassium adapted group compared with hypertensive and post-treated group while ICAM-1 expression was relatively lower in both potassium adapted and post-treated animals.

CONCLUSION: Raised arterial blood pressure is inducible by high salt diet. This is associated with an increased concentration of Hs-CRP with concomitant high expressions of PSGL-1 and ICAM-1. Potassium adaptation inhibited the development of hypertension and reduced ICAM-1 expression significantly.

A18 - Cadavers for education and research: Overcoming challenges in Rwanda

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ABSTRACT

INTRODUCTION: The anatomy is the foundation for medical education and practice. Teaching anatomy has evolved with decades however the dissection remains a golden standard for a quality delivery of the anatomy learning. In Rwanda, anatomy has been introduced in medical program 7 years after the beginning of medical education. The development of clinical anatomy unit in 2002. At the beginning, the collection of anatomical specimen was from amputated limbs and body organs from autopsy.

METHODS: The law that regulates the use of human bodies, organs and tissues in teaching and research was promulgated in 2010.

From 2020, the S-CAR in collaboration with the UR department of surgery and the UR clinical anatomy unit is regularly organizing surgical anatomy dissection with a positive impact on the surgical trainees' skills. Those courses have increased the need of cadavers at the UR clinical anatomy unit. To overcome that specific challenge, the UR clinical anatomy unit has signed MoU on cadavers for teaching purpose supply with various hospital in Rwanda.

RESULTS: Challenges for getting cadavers range from mindset even with health professionals including medics. The logistics to supplying cadavers, conserve them and having a disposal system is another challenge. An anatomy lab to function needs enough financial resources which is not the case in Rwanda as low resourced country.

CONCLUSION: However, despite all those challenges, the anatomy is alive in Rwanda as we are able to mobilize additional resources from various partners

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