Artesunate-mefloquine combination induces oxidative stress and deranges hepatic histology.

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The resistance of malaria to anti-malaria drugs necessitated the need to bring forth new therapies to avert the resistance; one of these is the combination therapy (WHO, 2005). The individual drug particularly mefloquine have been reported to have low tolerance effects (Jhas and Kumar, 2006). This study was therefore setup to investigate the oxidative and hepatic histomorphological effect of artesunate-mefloquine combination therapy in rats. Female wistar rats (150-180g, n=10) were randomly divided into two groups designated control (2.5ml of distilled water), and artesunate-mefloquine group (22.5mg/kg of artesunate-mefloquine combination). All groups had access to food and water ad libitum, and the drug was orally administered for 28 days. After 28 days, the rats were anesthetized with urethane and chloralose intraperitoneally at a dose of 5ml/kg and blood sample was drawn via cardiac puncture for estimation of serum levels malondialdehyde and antioxidant enzymes. The animals were euthanized by cervical dislocation, and the liver was excised for histological analysis. There was a significant increase in malondialdehyde level in the artesunate-mefloquine group compared to the control group (p<0.05). The antioxidant enzymes analysis showed a significant decrease in glutathione level compared to the control (p<0.05) but a marginal decrease was observed in catalase and superoxide dismutase levels. The histopathological observation showed cellular abnormalities and inflammation in the liver of artesunate-mefloquine group. Following the oxidative analysis and the histopathological findings, artesunate–mefloquine combination might have induced oxidative stress which might consequently result in tissue damage as observed in the liver tissue.

References:

Modulatory role of Aqueous-ethanolic crude extract of Alysicarpus ovalifolius on blood glucose levels of alloxan-induced hyperglycemic (Diabetic) wistar rats

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This study was aimed to evaluate the effect of aqueous-ethanolic crude extract of Alysicarpus ovalifolius on blood glucose concentration and histopathology of the pancreas in alloxan induced hyperglycemic wistar rats. The preliminary phytochemical screening of the extract revealed the presence of Anthracene, flavonoids, saponins, steroids, terpenoids and tannins. Also, the LD50 of the extract was found to be 894.4mg/kg Ip. Rats were made diabetic by intraperitoneal injection of 150mg/kg body weight of Alloxan monohydrate and divided into groups 1-5 with group 5 as a positive control (treated with insulin). Groups 2-4 were treated with 50,100 and 200mg/kg body weight of the extracts and group 1 was used as a negative control and received 0.2ml of normal saline. The fasting blood glucose levels were determined at intervals of 0, 1, 3, 5, and 7 days. A significant (P<0.05) decrease in blood glucose levels of extracts 200mg/kg (213.0±20.32), and 100mg/kg (237±68.71) per body weights treated groups was observed on day 1. However, On day3 and 5 of the experiment, Blood glucose levels were significant (P<0.05) lowered in extract 50mg/kg treated group; 120.6±15.55 on day 3 and 123.44±19.17 on day 5 compared to normal saline treated group value (286.0±44.31) on day 3 and 266.6±45.06 on day 5. On day7 blood glucose levels was observed to be significantly lowered (197.0±33.27) in 200mg/kg, and (118.4±5.85) in 50mg/kg extract treated groups compared to negative control (normal saline 0.2ml) (262.8±55.56). Pronounced preservation of islets of Langerhans cells was seen in extract 50mg/kg per body weight treated group. Alysicarpus ovalifolious extract revealed; valued medicinal constituents, Antihyperglycemic activity, Preservative effects on islets of Langerhans cells. The results obtained provide the scientific rationale for the use of Alysicarpus ovalifolious plant as a medicinal plant (especially antihyperglycemic agent).

REFERENCES

Effect of tigernut (cyperus esculentus) supplement on liver enzymes of alloxan induced diabetic wistar rats

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Despite the progressive efforts to produce synthetic drugs for treating diabetic patients, there is a widespread preference of patients to herbal medicine due high cost and poor availability of modern drugs for many rural populations, particularly in developing countries. The aim of this study was to detect the effect of tiger nut supplement on liver enzymes of allxan-induced diabetic Wistar rats. A total of thirty Wistar rats of both sexes weighing 100-150 g were used. They were randomly assigned into five groups of six rats (n = 6 rats/group). Group one was diabetic rats given distilled water and serve as the negative control. Group two were diabetic rats that received 5mg/kg body weight of glybenclamide orally for four weeks. While group three, four and five were diabetic rats that received 12.5, 25, and 50% tiger nut supplement mixed with 87.5, 75 and 50% of vital feed for four weeks respectively. Diabetes mellitus was induced by a single intraperitoneal injection of 150mg/kg body weight. Results of this study indicated a significant (p<0.05) increase in the activity of serum aspartate aminotransferase (64.60 ± 8.90, 51.60 ± 2.70, 43.20 ± 5.44), alanine aminotransferase (126.60 ± 13.89, 131.4 ±10.97, 154.40 ± 11.08) and alkaline phosphatase (2.62 ±0.51, 5.34 ± 0.91 5.02 ± 0.86) for 12.5%, 25% and 50% respectively as compared with the control. On the other hand, tiger nut supplemented diet (12.5% w/w) showed a significant (p<0.05) decrease in the level of alkaline phosphatase compared to the control. Therefore, it was concluded that tiger nut tubers had no significant effect on liver enzymes effects of Allxan induced diabetic rats.


Role of Selenium and Vitamin E on Gastric Mucosal Damage Induced By Water-Immersion Restraint Stress in Wistar Rats


1Department of Human Physiology, College of Medical Sciences, Gombe State University, Gombe, Nigeria. 2 Department of Human Physiology, Ahmadu Bello University, Zaria. Stress factor is an averse stimulus which disturbs homeostasis. Stress induces organ injury causing diseases, including, gastric ulcers, hypertension, diabetes mellitus and cancer. The aim of the present study was to determine the effect of selenium and vitamin E on gastric mucosal damage and acid secretion induced by water immersion restraint stress (WRS) in Wistar rats. (n = 70) Male Wistar rats weighing 200-220 g were divided in to five groups of seven rats each, viz: (i) passive control (non-stress rats), (ii) active control (WRS + distilled water), (iii) WRS + selenium (iv) WRS + vitamin E, (v) WRS + selenium + vitamin E. The WRS procedure lasted for 3.5 hours. Gastric tissues were isolated and investigated macroscopically and histologically to determine mucosal damage. Gastric secretion was collected after additional 3 hours of pyloric ligation. Blood samples were collected through cardiac puncture for the investigation of plasma concentration of malondialdehyde (MDA). The result demonstrated that acute WRS significantly (P < 0.001) increase gastric ulcer and gastric secretion parameters as well as MDA concentration. Pre-treatment with selenium or vitamin E significantly lowered the gastric parameters and MDA concentration especially in rats co-administered with selenium and vitamin E. It was concluded that acute WRS exposure causes significant alteration in the structure of the gastric tissue and increased plasma MDA. Pre-treatment with selenium and vitamin E ameliorated the adverse effects of WRS, and co-administration of selenium and vitamin E exerted synergistic effects in the restoration of WRS-induced changes.

Investigation of blood pressure reducing property of different varieties of lycopersicon esculentum in wistar rats

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Hypertension remains a global challenge even in the 21st century with attendant increase mortality rate. The quest for alternative management medications suffixed our investigation using different varieties of Lycopersicon esculentum (tomatoes) commonly consumed within our locality. Tomatoes outside its juiciness and rich flavour are quietly gaining a place in the prevention and management of hypertension. This attribute is suggestive of the presence of lycopene, potassium, beta carotene and antioxidants in tomatoes. In the present study, 25 male wistar rats divided into 5 groups of 5 rats each were used. Group A served as the normal control group and was administered 0.9% normal saline as placebo. Group B was fed on 8% NaCl in feed and 1% NaCl in drinking water (to mimic a hypertensive model) and Jos variety fresh tomatoes. Group C received same treatment as group B but was fed on UTC variety of fresh tomatoes. Group D received same treatment as group B but was fed with Gboko variety of fresh tomatoes. Group E received same treatment as group B but was not administered tomatoes rather lisinopril at 25mg/kg. Administration lasted for 28 days and all animals were allowed access to food and water ad libitum. Standard methods were used to access systolic blood pressure, diastolic blood pressure, heart rate and total cholesterol levels in all groups. ANOVA was used to analyze data and probability level of p<0.05 considered significant. Result of the study showed a duration-dependent significant (p<0.05) increase in systolic and diastolic blood pressure in all the tomatoes treated groups compared to the control. Groups B and C showed decrease blood pressure compared to group D. However, lisinopril treated group (E) showed a decrease systolic and diastolic blood pressure compared to the tomatoes treated groups. There was no significant difference in heart rates among the tomatoes treated groups. However, group D, the Gboko variety tomatoes treated group showed decreased heart rate compared to the control group. But all the tomatoes treated groups showed decreased heart rate compared to the lisinopril group. Total cholesterol level was significantly higher in the tomatoes treated groups compared to the lisinopril group. But among the tomatoes treated groups, it was significantly higher in the Gboko variety group compared to the Jos and UTC variety groups. All these indices put together.

References


sugest that the Jos and UTC varieties of tomatoes shows a better blood pressure reducing ability compared to the Gboko variety. However, lisinopril still proves a better alternative. And if these results are applicable to man, the consumption of Jos and UTC varieties of tomatoes should be encouraged.

References


Effect of sympathetic autonomic stress on left ventricular function in young healthy adults

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Stress elicits changes in sympathetic and parasympathetic balance which precipitate cardiovascular diseases. The aim of study was to determine the effect of sympathetic autonomic stress stimulus on left ventricular function in young healthy adults. Fifty-one (51) normotensive young healthy subjects (age 23.55±0.51 years) took part in the study after giving informed consent. Ethical clearance was granted by the Health Research and Ethics Committee of Lagos State University Teaching Hospital. After obtaining baseline measurements, heart rate (HR), blood pressure (BP) and left ventricular function (assessed by means of ejection fraction (EF) obtained by transthoracic 2-D echocardiography) were determined before and after sympathetic activation using cold pressor test (CPT). Venous blood samples were obtained from a peripheral vein for the determination of plasma norepinephrine. Statistical analysis was carried out by means of student t-test and analysis of variance (ANOVA) using GraphPad Prism 5. Data were expressed as mean±SEM and statistical significance accepted at p < 0.05. Exposure to CPT led to significant increase (p<0.0001) in HR (70.39±1.43bpm to 91.63±2.00bpm), SBP (118.40±1.02mmHg to 137.90±1.92mmHg) and DBP (70.77±0.87mmHg to 90.86±1.41mmHg). Subjects’ EDV (101.1±2.15ml to 104.2±2.62ml), ESV (38.67±2.23ml to 40.26±1.57ml) and EF (61.90±0.78% to 60.89±0.85%) remained unaltered (p>0.05) following exposure to CPT. Plasma NE remained unaltered (p=0.49) following exposure to CPT (195.7±45.33pg/ml to 315.8±91.45pg/ml). We conclude that stress induced by increased sympathetic activation has marginal effect on left ventricular function in young healthy adults.

Reference

1. Brotman D. J., et al., 2016). The reactive oxygen species (ROS)-total anti-oxidant capacity (TAC) score (Sharma et al., 1999) to understand the effect of CS on oxidative stress and the possible anti-oxidative effect of melatonin and vitamin C. Fifty-four male albino rats were randomised to 9 oral treatment groups (n=6): Groups I and II were control and received 1 ml/kg normal saline and 10% ethanol (vehicle for CS administration) respectively. Groups III-V received melatonin (4 mg/kg), vitamin C (1.25 g/kg) and melatonin+vitamin C respectively. Group VI-IX received CS (2 mg/kg), CS+melatonin, CS+vitamin C, and CS+melatonin+vitamin C respectively. All treatment lasted for 30 days. CS reduced sperm parameters, TAC, and ROS-TAC score but increase ROS, while melatonin and/or vitamin C improved these parameters. CS-induced spermatotoxicity and oxidative stress were exacerbated by melatonin or vitamin C but ameliorated by their combination (melatonin+vitamin C). Furthermore, ROS-TAC score better predicted spermatotoxicity than either TAC or ROS. In conclusion, this study further implicates oxidative stress in CS-induced spermatotoxicity using the ROS-TAC score. It also provides evidences for the preventive effect of melatonin and vitamin C on sperm toxicity and oxidative stress when combined but not when administered separately in rats receiving CS.

References


Association between Adiponectin, Serum Lipids and Obesity in a University setting in Nigeria

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2Obesity, a condition of imbalance between energy intake and energy expenditure, is on the increase, and is usually accompanied with comorbidities including metabolic and cardiovascular disturbances. Adiponectin, produced by adipocytes, is an important adipocytokine that is involved in carbohydrate and lipid metabolism, and also exhibits cardio-protective activities. It is well documented that adiponectin level is altered in obesity in various populations. In Nigeria, however, very few studies regarding adiponectin exist, and none, to the best of our knowledge, investigated any relationship between adiponectin, lipid profile, and obesity. This study aims to evaluate the relationship between adiponectin, serum lipids and BMI in a Nigerian setting. A total of 280 staff and students (186 males, 94 females) of Kaduna State University, within the age group of 18 - 76 years participated in the study. Ethical approval was granted by Kaduna State Ministry of Health, Ethical Consideration Committee, and informed, written consent was obtained from each respondent. Anthropometric and haematologic parameters were determined in each participant after 12 hour fasting. Serum adiponectin level was evaluated by enzyme-linked immunosorbent assay (ELISA) using WKEA Human Adiponectin ELISA kit, while serum lipid profile was determined by enzymatic endpoint method using RANDOX kit. More females were obese than males. Adiponectin concentration was significant (normal 1.4 ± 0.03; overweight 1.6 ± 0.06; obese 1.5 ± 0.05 µg/L) between BMI classes in males but not in females (normal 1.5 ± 0.06; overweight 1.4 ± 0.07; obese 1.5 ± 0.05 µg/L). Serum lipids were also not significant between BMI classes. Pearson’s
correlation revealed no relationship between adiponectin and lipid profile in this study.

References

Cadmium-induced changes in reproductive activities of male Wistar rats: Protective role of Carpolobia lutea
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Generation of oxidative stress is one of the plausible mechanisms for cadmium-induced reproductive dysfunction. Carpolobia lutea is an effective free radical scavenger. The present study investigate the potential protective effects of methanol root extract of Carpolobia lutea against cadmium toxicity. Thirty six rats were randomly divided into six groups of six animals each. Group I (control) was administered distilled water, group II received 2 mg/kg BW of cadmium (i.p single dose), group III received 2 mg/kg BW of cadmium (i.p single dose) with 100 mg/kg BW of Carpolobia lutea extract, group IV received 2 mg/kg BW of cadmium (i.p single dose) with 200 mg/kg BW of Carpolobia lutea extract, while group V and VI received 100 mg/kg and 200 mg/kg BW of Carpolobia lutea extract respectively. Vehicle and extract were given daily orally for 8weeks. 40 mg/kg BW of sodium thiopentone was given (i.p). Cadmium treatment caused a significant (p=0.05) reduction in serum hormone levels, androgenic enzymes activities, acrosome reacted capacitated sperms. Cadmium also significantly (p=0.05) caused increase in acrosome intact uncapacitated sperms and abnormal sperm chromatin. Conversely, the extract significantly improved the reduction noticed in hormone characteristics, testicular androgenic enzymes activities and acrosome reacted capacitated sperms in cadmium-treated rats. Also, the extract significantly reduced (p=0.05) the acrosome intact uncapacitated sperms and abnormal sperm chromatin in cadmium-treated groups. In conclusion, Carpolobia lutea root extract attenuated cadmium-induced testicular toxicity and improves serum hormone levels of the rats.

References

Effects of Carpolobia lutea on cadmium-induced reproductive toxicity in male Wistar rats
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Cadmium is known to adversely affect reproductive functions. Carpolobia lutea is a protective herbal derivative due to its aphrodisiac potential. This study investigates the effects of methanol root extract of Carpolobia lutea on cadmium-induced reproductive toxicity in male rats. Thirty six rats were randomly divided into six groups of six animals each. Group I (control) received distilled water, group II received 2 mg/kg BW of cadmium (i.p single dose), group III received 2 mg/kg BW of cadmium (i.p single dose) with 100 mg/kg BW of extract, group IV received 2 mg/kg BW of cadmium (i.p single dose) with 200 mg/kg BW of extract, while group V and VI received 100 mg/kg and 200 mg/kg BW of extract respectively. The vehicle and extract were administered daily orally for 8weeks. 40 mg/kg BW of sodium thiopentone was given (i.p). Cadmium caused significant (p=0.05) reductions in relative testicular weight, sperm count, motility, viability, normal sperm morphology, catalase and superoxide dismutase activities in testes. Cadmium also caused a significant (p=0.05) increase in testicular malondialdehyde. Histopathologically, cadmium caused impairment in testicular cytoarchitecture of rats. Conversely, the extract significantly improved the reduction observed in testicular weight, sperm characteristics, activities of catalase and superoxide dismutase as well as histopathological alterations of the testes in cadmium-treated rats. Also, the extract significantly reduced (p=0.05) testicular level of MDA, in cadmium-treated groups. Overall, the extract ameliorates cadmium-induced testicular toxicity and improves sperm quality of the rats.

B1-adrenergic receptors are involved in caffeine-induced hepatic glycogen depletion in rabbits
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Caffeine has been reported to alter hepatic carbohydrate metabolism. However the role of B1-Adrenergic Receptors in caffeine induced alterations in carbohydrate metabolism in the liver is not known. The present study was thus designed to determine the role of B1-Adrenergic Receptor in caffeine induced alterations in hepatic carbohydrate metabolism in the rabbit. The study was carried out on adult male New Zealand rabbits divided into 3 groups (n=5). Group I rabbits served as control and were given 0.5ml/Kg of normal saline while group II and III rabbits were administered with 2 and 6mg/kg of caffeine respectively for 28 days. Blood samples were collected by retro orbital puncture and separated for plasma and serum. Blood glucose was determined by glucose oxidase principle. Plasma catecholamine (adrenaline, noradrenaline and dopamine) were determined by competitive Enzyme Immunoassay technique with the aid of LDN assay kit. Animals were sacrificed by cervical dislocation and hepatic tissue biopsies were collected on dry ice for biochemical and immunohistochemical analysis. Hepatic tissue glycogen concentration was determined with the aid of anthrone reagent. Hepatic cAMP tissue concentration was determined by ELISA technique with assay kit obtained from Biovision inc. Hepatic tissue adrenaline cyclase 9 (AC9) and B1-Adrenergic Receptor expressions and activity were determined by immunohistochemistry technique with assay kits obtained from Biovision inc. and antibody obtained from Bioss USA. The results show that Caffeine (2 and 6mg/kg) significantly decreased hepatic tissue glycogen concentrations from 122.5±3.751 to 80.55±10.9 and 81.52±6.6mg/100g respectively. It also significantly increased blood glucose throughout the post administration observation period (p<0.01). Caffeine increased circulating levels of catecholamines: plasma adrenaline increased from 0.3173±0.015ng/ml to 0.3711±0.031ng/ml and 0.4312±0.034ng/ml respectively, plasma noradrenaline increased from 0.05517±0.004ng/ml to 0.06809±0.007ng/ml and

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0.1205±0.021ng/ml respectively (p<0.01), and plasma dopamine increased from 2.694±0.133ng/ml to 3.099±0.091ng/ml and 3.287±0.083ng/ml respectively (p<0.01). The results also show an increase in hepatic tissue cAMP concentrations from 5.364±0.35pmol/well to 5.472±0.22pmol/well and 6.498±0.23pmol/well respectively (p<0.01) in response to caffeine. Caffeine increased the hepatic enzyme activity of AC9 from 5.8±2.3% to 28.3±6.7 and 38.7±7.8% respectively for the two doses. The two doses of caffeine showed increase in expression of hepatic adrenergic beta 1 receptor from 7.3±2.23 to 8.4±2.8 and 18.3±3.69% respectively. In conclusion, this study demonstrates that the effect of caffeine on carbohydrate metabolism in the liver is through the release of catecholamines and it involves activation of adenylyl cyclase 9 and up-regulation of hepatic beta-1 adrenergic receptors.

Inflammatory response and Insulin secretory activity in experimental type 2 diabetic rats treated orally with magnesium
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This study investigated insulin secretory activities and inflammatory response in experimental type-2 diabetic rats treated orally with magnesium. 32 male Wistar rats were randomly divided into 4groups. Experimental type-2-diabetes was induced with alloxan (50mg/kg) and high fat diet for 10weeks prior to experimental procedures. Group1 was control; group2, diabetic untreated while groups3 and 4 were treated with metformin (250mg/kg) and magnesium (250mg/kg) for 14days respectively. Blood glucose (BG) was monitored before diabetes induction, on day1 (after establishment of diabetes), day7,10 and 14 respectively. Blood samples was thereafter collected by cardiac puncture following light ether anaesthesia, serum was obtained and analysed for insulin, c-reactive peptide (CRP), interleukin-6 (II-6), magnesium and lipid profile using laboratory kits while pancreatic beta cell function and insulin resistance was estimated using Homeostasis Model Assessment equations. Significant increase (P<0.05) in BG was observed in groups 2-4 on day1 (after establishment of diabetes) compared to controls. On day14, BG, beta cell function, triglyceride, cholesterol and LDL was significantly increased (P<0.05) in group2 compared to other groups. Serum insulin, magnesium and insulin resistance was significantly increased in groups 2-4 compared to control. Serum CRP was elevated while II-6 was reduced in groups3 and 4 respectively compared to control. HDL was significantly increased in groups 3,4 compared to control and group2 respectively.
In conclusion, oral magnesium treatment exerts a hypoglycaemic and hypolipidemic effect, up-regulates insulin secretory activities, increases serum magnesium level, reduces interleukin-6 but doesn’t reduce c-reactive peptide and insulin resistance in experimental type-2 diabetic rats.

References:

Hepatic Effect of the Chronic Exposure to Mosquito Coil Smoke in Albino Mice

Ref:
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The hepatic effect of chronic inhalation of mosquito coil smoke in mice was investigated. Mosquito coil smoke is mosquito repellent incense made from dried pyrethrum powder. It is widely used in Africa, Asia and South America. Exposure to mosquito coil smoke can lead to coughing, sneezing, and inflammation of trachea, renal damage, body weight reduction, and headache, itching and skin reaction. It also decreases the protein biosynthetic activity of the liver. This could affect capacity of serum protein-mediated transport of various substances. Golddeer mosquito coil containing 0.03% Transfluthrin, manufactured in Kano, Nigeria and purchased in Zaria was used. Twenty four, (24) male mice (20-40g), were divided into four groups of six mice each and exposed for six weeks to mosquito coil smoke for 1, 2 and 3 hours in an inhalation chamber. The animals were humanely sacrificed and the blood sample collected was used to assay for liver enzymes, AST, ALP and ALT. Brain tissues were also collected, homogenized and centrifuged and the supernatants assayed for oxidative stress biomarker and antioxidant enzymes, superoxide dismutase (SOD) and Catalase (CAT). Data were analyzed using one way ANOVA and expressed as Mean ± SEM with value of P<0.05 considered statistically significant. The result showed that the mosquito coil smoke exposure in mice does not cause any significant change in liver enzymes, MDA and SOD. However, there was a significant increase in CAT activity (43.83 ± 1.85) and (41.67 ± 1.36) as compared to control (38.50 ± 0.92).
Reference:

Chronic administration of gabapentin and gabapentin-carbamazepine combination reversibly suppress testicular functions in male Wistar rat (rattus norvegicus)
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Introduction: Antiepileptics are used chronically, leading to adverse effects including decrease or loss of fertility. Multiple drugs are also used for prolonged periods leading to additive untoward effects. Aim: The effects of chronic administration of gabapentin-carbamazepine combination on some fertility parameter in male rats were investigated to see the effect of combining reduced doses of antiepileptics in the management of seizures, particularly the antifertility sequelae of chronic antiepileptic administration. Methodology Male Wistar rats were distributed into four groups of ten rats each. Group one, the control group, received normal saline 0.1ml per day, intraperitoneally (i.p); group two received gabapentin (GBP)16 mg/kg i.p per day; group three received carbaamazepine (CBZ) 20mg/kg i.p per day while group four received sub-therapeutic doses of both GBP (8mg/kg i.p) and CBZ (10mg/kg, i.p)
combination daily. The treatment lasted for 28 days. Twenty four hours after the last treatment, five rats from each group were sacrificed and the other five served as the recovery groups. Sperm characteristics evaluation, serum testosterone and histopathological alterations in the testis were assessed both after four weeks of continuous drug administration and four weeks of drug withdrawal. Result GBP, CBZ and GBP-CBZ combination significantly reduced the absolute weight of the testis, epididymis and seminal vesicle (p<0.05). Weights of the animals were also reduced significantly (p<0.05) in the CBZ and GBP-CBZ combination groups. The epididymal sperm motility/viability (life/death ratio) was significantly reduced (p<0.05) in CBZ and GBP-CBZ combination groups. Moreover, epididymal sperm count and morphology were significantly decreased (p<0.05) in GBP, CBZ and GBP-CBZ groups. Reduction in serum levels of testosterone for all the treated groups was statistically significant (p<0.05). The histopathological alterations observed in the testis of CBZ and GBP-CBZ groups show disorganization of cytoarchitecture of the testicular tissue. Fertility and other associated changes were almost restored in GBP treated rats within 28 days of cessation of treatment. Conclusion: CBZ and GBP-CBZ combination appear to have delayed but reversible antifertility action in the rats. Hence, chronic administrations of GBP, CBZ and GBP-CBZ combination have adverse effects on male fertility but these effects are reversible once the drugs are withdrawn.


Role of iron in learning and memory in growing wistar rats.

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Iron is an essential micronutrient and is required for the development and proper function of the brain, including myelination, monoamine metabolism and neurotransmission. Most studies focus on iron overload in learning and memory in the elderly but generally, a lack of iron in the neonatal period and early childhood is considered as a key to the development of disturbances in cognitive development. The present study investigated the role of iron in learning and memory in growing Wistar rats model. Thirty Wistar rats were assigned to three groups of ten each. Group I served as the control and fed with normal rat chow while groups II and III were given iron-containing diet 100 mg iron/kg and 1000 mg iron/kg for 30 days respectively and subjected to novel object recognition task and spontaneous alternation using the Y-maze. The results showed that rats fed with 1000 mg iron/kg diet had higher significant discrimination ratio (p<0.05) and percentage preference (p<0.05) in the Y-maze than 100 mg iron/kg and the control. The improvement in learning and memory in 1000 mg iron/kg fed diet using different behavioural paradigms indicate the need for iron containing diets during periods of growth and development.

References


Mineralocorticoid receptor activation in estrogen-progestin oral contraceptive-treated female rats as an experimental model of cardiometabolic disorder

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Metabolic syndrome (MetS) is rapidly becoming major public health challenges. It is of a complex and highly debilitating disorders including hypertension, insulin resistance (IR), diabetes mellitus, dyslipidemia, visceral obesity and inflammation. MetS increases the risk of atherothrombotic cardiovascular disease (CVD), which is the main cause of death worldwide, in both sexes, although it appears to inflict a greater burden in women. The incidence of CVD among women is low before menopause but steadily increases thereafter. However, the increase is thought to result in part from the decline in circulating estrogen. Estrogen-progestin oral contraceptive (COC) use is associated with increased risk of CVD and metabolic dysregulation. However, possible mechanisms responsible for COC-induced cardiometabolic disorder (CMD) are not well documented. We have attempted to develop an experimental CMD female rat model by COC treatment. The model is characterized by increased visceral adiposity, impaired glucose tolerance, insulin resistance, hyperinsulinemia, atherogenic dyslipidemia, hypertension, impaired NO-mediated endothelial function, increased proinflammatory and prothrombotic markers. Over-reactivity of systemic and upregulation of tissue renin-angiotensin system genes have also been implicated in this model (Olatunji et al., 2016a, 2016b). We also explored the role of the mineralocorticoid receptor (MR) which is a member of the steroid-responsive nuclear receptor family, and the efforts indicated that MR is activated irrespective of the classic (mineralocorticoid) and nonclassic (glucocorticoid) ligands. It has been implicated to be the primary underlying mechanism for the development of COC-induced CMD. Molecular studies provide further evidence that COC use upregulated expression of MR target genes such as serum angiotensinoid-regulated kinase 1 (Sgk-1), glucocorticoid-induced leucine zipper (Gilz), epithelial Na channel (Enac) and Na+–K+–ATPase subunit α1 (Atp1a1), plasminogen activator inhibitor-1 (Pai-1), and epidermal growth factor receptor (Egfr). COC treatment is also accompanied by increased recruitment of MR and PolI in parallel with increased H3Ac and H3K4me3 on the promoter regions of MR target genes, suggesting that COC activates MR through histone code modifications (Igunu et al., 2015). Taken together, this MR-centered hypothesis seems to provide a unifying mechanism for CMD-induced experimental model and the model promises to be a useful experimental tool in understanding MR-related CMD disorder.

References


Lower pitch voice produce by effort sound in previously uvulectomized children.
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The palatine uvula is conic projection composing of soft connective tissue which has a number of racemose glands. It hangs from the posterior edge of the middle of the soft palate of the roof of the mouth. It has circular muscle fibres at its base and helps in closing the nasopharynx during deglutition. Copious secretion from the uvula helps moisten the larynx and vocal cord to maintain quality speech. In the Hausas’ culture in Northern Nigeria, the uvula is highly demonized and blamed for a lot of health problems and risk of death and so all infants must ‘proactively’ undergo uvulectomy on the 7th day after birth, with few exceptions. This study aims at studying the effect of uvulectomy on pitch quality of crying infants and effort sounds of young children between 2 to 11 years of age. Eighty subjects were divided into two groups of 40 uvulectomized and 40 non-uvulectomized children which were further subdivided into various age ranges of equal mix of male and female. Audio frequency analyzer software is used to conduct the test and the result shows a reduction in frequency of the sounds produced by uvulectomized subjects, p<0.05. Uvulectomy does affect the quality of sound produced in children giving a significant lower pitch quality in effort sounds. Key words: Children Uvulectomy Non-uvulectomized Uvulectomized Sound Pitch Frequency REFERENCE:

Evaluation of 6 Hour Light/Dark Cycle on Serum Cortisol, Oxidative Stress Enzymes and Anxiety–Like Behaviors in Male Albino Wistar Rats
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Background: Ultradian rhythm of light and darkness is a complete cycle of light and dark exposure that is below the normal circadian rhythm. This leads to circadian misalignment causing a variety of circumstances, such as inappropriately timed sleep, wakefulness and feeding rhythms, Baron and Reid, (2014). Exposure to artificial light sources abound. Recent studies have demonstrated the association between artificial light sources and cardiovascular and metabolic diseases like obesity. Night shift workers and jet lag travellers suffer from abnormal sleep pattern and increase risks for cardiovascular, neuronal and metabolic diseases, Gumenyuk et al. (2014). Aim and Objectives: This study aimed at investigating ultradian rhythm on stress response, oxidative stress and anxiety–like behaviors in male Wistar rats. Materials and Methods: Twenty Wistar rats were randomly divided into two groups consisting of 10 animals each. Group 1 (control) was exposed to normal photo period, while group 2 was exposed to 6 hours light/dark cycles for 14 days. After which the animals were subjected to Elevated Plus Maze (EPM) and their blood samples were collected. Results and Conclusion: There was a statistical significant difference on the catalase and cortisol levels between the group 1 and group 2 (p < 0.05). However, there was no statistical difference in glutathione peroxidase (GPx) and superoxide dismutase (SOD) levels between group 1 and group 2 (p > 0.05). Similarly, there was no statistical difference in time spent in open arm, closed arm, urination and defecation in EPM. Ultradian rhythm of light increased stress level and mildly increased oxidation in the body. However, it did not affect anxiety–like behaviors of Wistar rats.

References

The effects of aqueous leaf extract of mangifera indica (mango) on ovarian functions in sprague dawley (SD) rats.
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Effects of Mangifera Indica (MI) on some reproductive functions as well as pregnancy outcome were reported earlier in both male and female rats respectively. More investigations of the effects of oral administration of MI on ovarian functions were done. 40 virgin female SD rats with body weight 110-150g were divided into 2 groups of control: 500mg/kg distilled water per day (n=20) and treated: 500mg/kg aqueous leaf extract of MI per day (n=20). Body weight and estrus cycle were monitored before and throughout the study. After 4 weeks of administration, blood samples were collected for Estradiol, Progesterone, Follicle Stimulating Hormone (FSH) and Luteinizing Hormone (LH) assay and animals were later sacrificed to harvest the ovary and uterus on proestrus, estrus, metestrus and diestrus. The results showed a significant (p<0.05) reduction in body weight gained in MI treated rats. Occurrence of diestrous and metestrus was higher p<0.05 while proestrus and estrus was lower p<0.05 compared with the control, FSH level was reduced (p<0.05) at proestrus and diestrus in MI treated rats, LH was lower (p<0.05) at proestrus and estrus but high (p<0.05) at diestrus. Estradiol level was only high (p<0.05) at proestrus and diestrus. Progesterone was significantly lower p<0.05 at diestrus. The decrease in weight of the ovary was not significant (p>0.05) throughout the estrus cycle when compared with control. Uterine weight was only significantly reduced (p<0.05) at metestrus. In conclusion, oral administration of extract of MI at a dose of 500 mg/kg/day altered the ovarian functions in rats by disrupting the hormone at each stage of the cycle.

References
Neck circumference is an independent predictor of relative systemic hypertension in young adult with sickle cell anemia

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A seemingly interesting observation in patients with sickle cell anemia (SCA) is that they usually have lower systemic blood pressures (BP) and insulin resistance than the general population in spite of chronic inflammation and vasculopathy (Pikilidou et al., 2015). However, the relative systemic hypertension (rHTN) has been linked to pulmonary hypertension, increased blood viscosity and renal insufficiency, and a risk factor for cardiometabolic disorder (CMD) in SCA (Gordeuk et al; 2008). It was hypothesized that neck circumference (NC) and CMD marker; triglyceride-glucose (TyG) index independently predict rHTN in young adults with SCA in steady state. Anthropometrical, hematological, hemorheological and CMD markers between SCA patients with normal BP < 120/70 mmHg; nHTN, n = 65) and those with rHTN (BP ≥ 120/70 mmHg, n = 32). SCA with rHTN had significantly higher body weight, waist circumference, NC, plasma viscosity, systemic BP. Neck circumference (OR: 2.98; 95% CI 1.46 to 6.10, p < 0.01) was a predictor of rHTN in SCA independently of gender, age, weight, waist circumference, BMI, blood viscosity, triglyceride or TyG. A receiver operating characteristic curve analysis also showed that NC was the most efficient predictor of rHTN than other CMD markers. This suggests that increased NC is a salient risk factors that promote the development of rHTN in SCA. It underscores the utility of NC in early detection and stratification of systemic hypertension, particularly in individuals with SCA.

References

Repletion of oestrogen by ethinylestradiol and levonorgestrel improves insulin resistance and pancreatic β-cell dysfunction independent of elevated circulating mineralocorticoid in ovariectomized rats

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Objective: Postmenopausal oestrogen deficiency has been associated with increases in cardiovascular diseases (CVD) (Ho and Mosca, 2002) and recent randomized clinical trials of standard formulations of hormonal therapies (HT) have not demonstrated a benefit in reducing CVD, hence, it is apparent that innovative alternative strategies for HT in postmenopausal women are necessary. Oral contraceptives (OCs) have been used as exogenous oestrogen to normalise the physiologic drop in oestrogen level seen during menopause (Rossouw et al., 2002). Ovariectomized rodents model human postmenopausal state in that they develop metabolic dysfunction (Ko et al., 2013), including insulin resistance (IR). We therefore hypothesized that repletion of oestrogen by OC containing ethinylestradiol and levonorgestrel will improve IR and pancreatic β-cell dysfunction through reduction in circulating mineralocorticoid level in ovariectomized rats. Methodology: Twelve week-old female Wistar rats were divided into four groups; sham-operated (SHAM) and ovariectomized (OVX) rats treated with or without OC (1.0μg ethinylestradiol and 5.0μg levonorgestrel) daily for 8 weeks. IR was estimated using homeostatic model assessment (HOMA) whereas homeostatic model of assessment of β-cell (HOMA-β) and 1hr post-load glucose level were estimated as pancreatic β-cell dysfunction. Circulating aldosterone and oestradiol levels were estimated by ELISA kits. Results: Results showed that ovariectomized and sham-operated rats treated with OC led to increased HOMA-IR, 1hr post-load glucose level, HOMA-β, triglycerides (TG), total cholesterol (TC), TC/HDL-cholesterol, TG/HDL-cholesterol, plasma insulin and aldosterone. On the other hand ovariectomized rats treated with OC ameliorated all these effects except aldosterone. Conclusion: The results showed that OC improves insulin resistance and pancreatic β-cell dysfunction independent of circulating aldosterone. The results also suggest a possible role of OC in hormonal therapy in postmenopausal women.

References

Effects of Rutin Supplement on Memory, Learning and Brain Lipid Peroxidation in Swiss Albino Mice
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Background:– Learning is acquiring new or modifying existing knowledge, behaviours, skills, values or preferences, memory on the other hand is the process by which information is encoded, stored and retrieved Daniel et al. (2011). Rutin belongs to a group of plant compound, bioflavonoids which are powerful antioxidant agents that scavenges excess free radicals in the body system.
Researches revealed that rutin supplementation improved hippocampal based memory in rat koda et al. (2002) and attenuate age-related memory deficit in mice Kishore (2004). Aim and Objectives: The aim of this study was to determine effects of rutin supplementation on memory and learning performance and brain lipid peroxidation in mice. Materials and Method: 75 mice of both sexes were used for the study. Twenty five mice were used in each behavioural paradigm: Morris water (MMW), Barnes (BM) and Elevated plus (EPM) mazes. The animals were divided into five groups of five mice each (n = 5). Group I control group (10ml/kg dH2O) Group II, III, and IV (50mg/kg, 100mg/kg, and 200mg/kg) respectively, Group V Piracetam (100mg/kg) orally. Mice were euthanized and brain tissues was collected for acetylcholinesterase enzyme activity and lipid peroxidation assay. Results and Conclusion: Rutin supplementation at the 50mg/kg increased time spent in the target quadrant when compared with control in MWM (p<0.05). Further, there was a statistical significant decrease in the level of lipid peroxidation of the brain samples of mice in elevated plus maze at 200mg/kg. However, there was no statistical significant difference of rutin supplementation and control in Barnes and elevated plus maze paradigms. There was also no statistical significant difference in acetylcholinesterase enzyme activity. Rutin supplementation improves memory in MWM, but has no effect in BM and EPM. It also affect lipid peroxidation but not acetylcholinesterase enzyme activity.

References

Assessment of Prolonged Use of Personal Computer on Color Perception among Undergraduate Students in Ahmadu Bello University Zaria
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Background: Color blindness is the inability to distinguish certain colors. Molecular studies have shown that defects in color vision result from the absence, malformation or alteration of one (monochromatism), two (dichromatism) or all (achromatism) of the pigment receptors in the retina. These defects may be inherited, acquired, or caused by a variety of other factors. The prevalence of color blindness is estimated to be around 8% of the male population and 0.5% of the female population. This study was designed to evaluate the effect of prolonged use of personal computer on color perception.

Methods: A total of 50 undergraduate students from the College of Medical Sciences, Gombe State University were recruited for the study. They were divided into two groups, group A (n=25) who used personal computers for a total of 6 hours per day and group B (n=25) who did not use personal computers. The color perception test was conducted using the Ishihara color vision test. The results were analyzed using the chi-square test. Results: A significant difference was observed in the color perception test between the two groups (p<0.05). Conclusions: Prolonged use of personal computer may lead to impairment of color perception.

References:

Effect of resveratrol on oxidative stress biomarkers in chlorpyrifos-treated mice
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Chlorpyrifos (CPF) has been associated with cognitive and psychomotor impairments in both humans and animals. This related cognitive impairment has been linked to its enhanced reactive oxygen species (ROS) generation capacity. Therefore, antioxidant treatment may provide a novel therapeutics for the management of these related impairments.

The aim of the study was to evaluate the effect of resveratrol in oxidative stress biomarkers profile mice. Swiss albino mice were divided into (4) four groups of four mice each (n=4). Group I served as the control and were administered olive oil (2 ml/kg). Group II received chlorpyrifos (CPF) 3 mg/kg, group III received resveratrol 30 mg/kg and group IV received CPF (3 mg/kg) after the oral administration of resveratrol (30 mg/kg). All administrations were done by oral gavage for a duration of 21 days. Cognitive function was assessed using Y-maze test and oxidative stress was evaluated using oxidative biomarkers techniques. The results showed that resveratrol at dose 30 mg/kg significantly (p<0.05) improved the activities of superoxide dismutase (SOD), catalase (CAT), as well as decreased (p<0.05) malondialdehyde (MDA) concentration when compared with the control. Glutathione (GSH) significantly (p<0.05) increased in the treated group when compared with the control.

References:

Hepatoprotective effect of camel milk on poloxamer 407 induced hyperlipidemia in wistar rats
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Hyperlipidemia results in complications such as atherosclerosis and metabolic syndrome. Poloxamer 407 (P407) has been utilized as a model to induce hyperlipidemia in animals. Camel milk has been reported to have therapeutic benefits against many diseases. This study was designed to investigate the effect of oral administration of camel milk on serum liver enzymes, total protein, albumin/globulin ratio and histology of the liver tissues in Poloxamer 407 induced hyperlipidemic Wistar rats. Adult male wistar rats were divided into six (6) groups of five each (n=5). Group I received distilled water (control), group II received...
Poloxamer P407, group III P407 and Atorvastatin (20mg/kg) and, group IV, V and VI: received P407 and Camel milk 1000mg/kg, 500mg/kg and 250mg/kg respectively. The, Serum concentration of liver enzymes AST, ALT, Total Protein and Globulin were significantly (P<0.05) higher in hyperlipidemic control group when compared to normal control and all treated groups while A/G ratio was significantly (P<0.05) reduced. All Camel milk treated groups showed significant (P<0.05) decrease in ALT and AST. Groups treated with camel milk at a dose of 1000mg/kg and 250mg/kg showed significant (P<0.05) decrease in Total Protein, Globulin with all camel milk treated groups having significant (P<0.05) increase in A/G ratio. Histological examination of liver tissues showed hepatocytes necrosis and adipocytes infiltration in all P407 induced groups except the group treated with camel milk at a dose of 250mg/kg which had only slight adipocytes infiltration. The findings showed the hepatoprotective effect of camel milk in poloxamer 407 induced hyperlipidemic wistar rats.

Reference

Effect of curcumin on blood glucose and neurobehavioral response in alloxan-induced diabetic swiss albino mice

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Cognitive deficit is an emerging health concern in diabetic patients and hyperglycemia and reactive oxygen species are well believed to be among the prime candidates mediating the behavioral impairments and memory deficits. Therefore, curcumin, which is an antioxidant, may provide a better treatment for this disease. The aim of this study was to evaluate the effect of curcumin on blood glucose level and neurobehavioral response in Alloxan-induced diabetic Swiss Albino mice. The animals were divided into five (5) groups each (n=4). Group I served as control and received distilled water, group II, III, IV and V were diabetic and received olive oil 1 ml/kg, glibenclamide 1 mg/kg, curcumin 50 mg/kg and curcumin 100mg/kg respectively. Diabetes was induced using Alloxan (150 mg/kg). All administrations were done for a duration of 14 days. Blood glucose level was determined using glucose oxidase principle and Allroach administrations were done for a duration of 14 days. Blood glucose level was determined using glucose oxidase principle and

Diabetes was induced using Alloxan (150 mg/kg). All administrations were done for a duration of 14 days. Blood glucose level was determined using glucose oxidase principle and cognitive impairment was determined using spontaneous alternation in the Y-maze. The result obtained from this study showed that curcumin at both doses (50 mg/kg and 100 mg/kg) recorded a higher percentage alternation when compared with olive oil (1 ml/kg). This study demonstrated that curcumin significantly (p<0.05) attenuated diabetes-induced cognitive impairment in the Y- maze. The findings of this study suggest that curcumin may ameliorate diabetes-induced cognitive impairment in Swiss albino mice.

Reference

Elevated extracellular potassium-ion concentration suppress hippocampal oscillations in a mouse model of Dravet syndrome in-vitro

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Transition from interictal to ictal activity, ictal discharges and seizure-like events, has consistently been demonstrated in hippocampal slices perfused with ≥ 5 mM high [K+] artificial cerebrospinal fluid (ACSF). But then, how reliable is this ionic model of seizure when employed for in-vitro studies of epileptic brain tissues with dysregulated K+ homeostasis? To address this important question, we examined how elevations of [K+]o affect hippocampal oscillations in Scn1a mutant mouse, a mouse model of Dravet syndrome, a devastating genetic-epilepsy associated with gliosis, a major cause of dysregulated K+ homeostasis in epileptic brain. To this end, performing local field potential (LFP) recordings from hippocampi of P30 to P38 Scn1a mutant mice (Scn1a +/-) and wild-type littermates (Scn1a +/-/+), maintained on a C57BL/6 genetic background, in brain slice preparations in normal and high K+ conditions, we studied the effect of 4 mM and 5 mM high [K+] ACSF(s) on hippocampal oscillations. Hippocampal hyperexcitability was observed only in Scn1a +/-/+ but not in Scn1a +/+ mice. In Scn1a +/-/+ mice, spontaneous hippocampal hyperexcitability was observed in standard ACSF but was significantly suppressed by 4 mM and 5 mM high [K+] ACSF(s). In conclusion, these findings, for the first time, provide evidence of spontaneous hippocampal activity in Scn1a+/- mice older than P30, a potential target for screening anti-epileptic approaches beneficial for the treatment of DS. Depolarization block of neuronal action potentials is involved in epileptic brain tissues modulated in elevated [K+]o. It underlies the suppressing effect of high [K+] ACSF on hippocampal oscillations in Scn1a+/- mice in vitro. Future studies employing the high K+ ionic model are required to determine how K+ homeostasis is handled by neurons and glial cells during spontaneous activity in this model.

References


Comparative Evaluation of the Anxiolytic property and Anticonvulsant Efficacy of Virgin Coconut-oil and Regular Antiepileptic Drugs in Wistar-Rats


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Background: Virgin Coconut oil (VCO) has been recognized as anxiolytic agent, efficacious in the treatment of intractable epilepsy for over 80 years. The mechanisms underlying its action remain an enigma and its pattern of protection is distinct from that of regular anti-epileptic drugs (AEDs), suggesting its uniqueness. To this end, the anxiolytic property and the anticonvulsant efficacy of VCO, Diazepam, Phenobarbital and Sodium Valporate were compared using the rat Vogel’s conflict test (VCT) and maximum electroconvulsive shock (MES) respectively. Methods: Fifty (50) male rats weighing (180-220) grams, randomly allocated into 10 groups of 5 rats each were used for the study. 1 VCO-group, 2 treated (1.5mg/kg/i.p. Diazepam or 50mg/kg/i.p Phenobarbital) and 1 control groups for VCT. 3 VCO-groups (2
treated [Phenobarbital or Sodium Valproate] and 1 untreated), 2 treated non-VCO-groups (50mg/kg/p Phenobarbital or 400mg/kg/p Sodium Valproate) and 1 control groups for MES. All rats were fed with standard feeds ad libitum. The VCO-groups received in addition, 10 ml/kg/day/6wks/oral-route of VCO, while the non-VCO groups similarly received 0.9% normal saline. In VCT, all rats were first habituated to 5 minutes (after first electric shock received) VCT every 3 days for 2 weeks following a 24 hours water-deprivation. Electric shocks: 20 volt, single pulse/10sec. using Slid-up Type Voltage regulator: P-I-240V, 50/60Hz; P-O-0-240V, 5AMP. Anti-conflict response occurs when drinking behavior becomes less sensitive to aversive condition. In MES, 80 volts/60Hz/sec. electric-shock delivered through ear clip electrodes and duration of tonic-seizure was measured. Data was analyzed by Student’s t-test. Results: The results showed that, anti-conflict response in VCO group was significantly higher than in diazepam or Phenobarbitral treated groups. In MES, Phenobarbital and Sodium Valporate showed greater reduction effect on seizure duration than VCO but it appears to potentiate the effects of the drugs. Conclusion: VCO has a higher anxiolytic profile than diazepam or Phenobarbitral in the VCT but its efficacy in MES appears to be unrelated to seizure duration.

References

The Effect of the Rho–kinase Inhibitor (Y-27632) on the Relaxation of Thromboxane A2 mimetic (U-46619) Induced Contraction in the Presence and Absence of the Endothelium

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Previous work shown that contraction of aortic vessels treated with the thromboxane mimetic (U-46619) persists for a much longer time compared to contractions evoked by other agonists. The slow relaxation in response to the TxA2 mimetic is dependent on the relaxation of Rhokinase inhibitor. In order to eliminate production of nitric oxide (NO) contributes to the faster relaxation of blood vessels treated with the Rhokinase inhibitor. In order to eliminate production of NO, vessels were either denuded with forceps to remove the endothelium or treated with L-NAME (specific inhibitor of NO). Isolated segments of aorta from white New Zealand rabbits (n=21) were divided into two groups; in the first group the endothelium was denuded using forceps while in the second group NO synthesis was inhibited by using L-NAME (100 µM). Acetylcholine relaxation was significantly different between rings with endothelium and rings without endothelium (P<0.001). Isolated segments of rabbit aorta were treated with U4 (0.5 µM) followed by addition of Y2 (1.0 µM). Following treatment with Y2, there was no significant difference between the E+ and E-vessels both in forceps denuded vessels (P=0.57) and L-NAME treated vessels (P=0.68). We therefore concluded that, even though Y2 significantly reduced the sustained contraction induced by U4, it does not require the release of nitric oxide from the endothelium for its action.

References

Insignificant Variation in Humidification of Inhaled Air in Response to Physiological Variation in Specific Gravity of Urine in Healthy Young Adults

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Hormonal and neural mechanisms are involved in homeostatic control of Extracellular fluid volume. Water inadequacy can trigger conservation effort that is to a large extent modulated by reduction in the quantity of water loss in urine thus resulting in excretion of smaller volume urine of higher specific gravity, an index that signals higher concentration. Dehydration is known to reduce the availability of water secretions by the body that includes tears, and saliva etc. Availability of water in the ECF is known to affects specific gravity of urine. This work aims at establishing the relationship between variation in urine specific gravity under normal condition and the humidification level of inhaled air measured by humidity of exhaled air. 50 male and 50 female healthy young adults were used for the study after ethical clearance. Five normal and successive nose-exhaled air was captured in air tight 2500 ml capacity polythene bag with a portable digital hygrometer within. In both sexes, there were no significant correlations between humidity of expired air, the extent of humidification and the specific gravity of urine (p > 0.05). This work suggests that variation in concentration of urine in normal condition, possibly triggered by reduction in ECF volume, has no relationship with the humidity of exhaled air and the extent of humidification of inhaled air. Conditioning of inhaled air is important and normally preserved in non-extreme situation.

References

Protective effect of Nigella sativa Oil on Aluminium Chloride Induced Cognitive Impairment and Hematological changes in Male Wistar Rats

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Background: Aluminium is a neurotoxic compound that interfere with a variety of cellular metabolic processes in the nervous system. In the brain, it accumulates in sensitive areas such as hippocampus and is considered a potential contributing factor to the pathogenesis of neurodegenerative disorders resulting in memory impairment. Nigella sativa, also known as black seed is a plant that have a neuroprotective effect against aluminium chloride induced memory impairment. AIMS: This study was designed to investigate the memory enhancing effects of Nigella sativa oil (NSO) on Aluminium chloride-induced memory impairment.
impairment. Methodology: A total of 45 male wistar rats (130g-250g) were randomly assigned into 5 groups (n=9), Group 1 (control), received 1ml/kg distilled water; Group 2 (AlCl3 50 mg/kg); Group 3 (AlCl3 50mg/kg + NSO 0.5ml/kg); Group 4 (AlCl3 50mg/kg + NSO 1ml/kg), and Group 5 (AlCl3 50mg/kg + NSO 2ml/kg) orally. Learning and memory was evaluated using elevated plus maze in which transfer latency (time taken to enter closed arm) was measured on day28 (acquisition trial) and day29 (retention trial) and spatial recognition memory and working memory were evaluated using Y-maze. Result: The result showed a significant increase (p<0.05) in TL for groups 3 (72.0 ± 1.4), 4 (63.5 ± 11.0) and 5 (85.8 ± 4.2) compared to group 1 (41.8 ± 12.3) and 2 (43.3 ± 13.9) in acquisition trial. In retention trial, there was significant increase in group 5 (78.5 ± 11.3) compared to groups 1 (33.5 ± 8.7), 3 (77.0 ± 10.1) and 4 (67.8 ± 11.4). In Y-maze there was a significant increase in group 3 and significant decrease in group 5 compared to group 2 in spatial recognition memory. In percentage spontaneous alteration, there was a significant decrease in group 4 and group 5 compared to group 2. Hematological indices shows that there was an increase in RBC count in group 2 compared to all other groups, in WBC count there was a decrease in group 2 compared to all other groups and PCV shows an increase in group 2 compared to all other groups. Conclusion: It was concluded that NSO has a neuroprotective effect against aluminium chloride induced memory impairment by increasing spatial recognition memory and spatial working memory and also AlCl3 causes an increase in RBC count and PCV but a decrease in WBC count. Key Word: Nigella sativa oil, aluminium chloride, hippocampus, elevated plus maze (EPM), Y-maze, memory impairment, neurotoxic

Zanthoxylum zanthoxyloides extract inhibits lipopolysaccharide-induced neuroinflammation in BV2 microglia
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Zanthoxylum zanthoxyloides (Z. zanthoxyloides) commonly called ‘toothache bark’ is widespread in West Africa. The plant is known for its anti-oxidant, anti-parasitic, anti-bacterial, anti-tumoral, anti-plasmodial and anti-hypertensive properties (Adefisoye et al., 2012, Williams et al., 2016). The root bark of Zanthoxylum zanthoxyloides have also been reported to have anti-inflammatory activity (Prempe and Attipoe, 2009). However, whether the root extract of Zanthoxylum zanthoxyloides could help suppress lipopolysaccharide-induced neuroinflammation remains unclear. In this study, we investigated an extract of Z. zanthoxyloides on selected cariogenic and enteric bacterial isolates. J Intercell Ethnopharmacol 2012; 1: 1-6


Effect of light-dark exposure on performance of animals in various neuro-behavioral paradigms
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Background: The hippocampus is well-known for its role in memory processing and learning and for its ability of neurogenesis. Any factor that influences neurogenesis in the hippocampus may lead to subsequent memory and learning deficiencies. Light is one of the factors that exert powerful effects on the hippocampal structure and function. Due to the importance of neurogenesis, the effects of the light-dark cycle on memory and learning deficiency need to be determined.

Materials and methods: A total of forty five (45) healthy litter albino mice of both sexes were used for the study. The animals were divided into three (3) groups. Group I (permanent light group (PL)) were kept and bred under constant (24 hours) light using fluorescent lamp, for eight (8) weeks. Animals in group II (permanent dark (PD)) were bred under permanent dark condition (24 hours daily) for eight weeks. Group III animals (alternate group (ALT)) were bred under normal light-dark cycle for eight weeks. Memory and learning were accessed using Barnes maze, elevated plus maze, Morris water maze and T-maze. At the end of the study, the animals were humansly sacrificed using chloroform anaesthesia. The brain was dissected and the hippocampus removed for histological study.

Result: Results of the study shows that performances of the animals in the different memory paradigms were statistically significant between groups (P<0.05). Animals in the PD group showed better performance using the Barnes maze.

Conclusion: Exposure of laboratory animals to light-dark conditions improve their performances in some memory and learning paradigms.

References:


Serotonin-Kynurenine Theory of Depression

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Depression is a significant mental disorder with physiological and psychological consequences, including sluggishness, diminished interest and pleasure, and disturbances in sleep and appetite Haddad et al. (2011). Biological factors such as low-grade
inflammation and endothelial dysfunction also induce depression. Various hypotheses have been proposed as an explanation for the association of inflammation with depression. Resscently, activation of the kynurenine (KYN) pathway has been suggested as a specific pathogenic mechanism that can explain the link between inflammation and depression Schwieler et al. (2016). Tryptophan degradation along this pathway produces several neuroactive compounds, such as quinolinic acid (QUIN) a neurotoxic metabolite of the pathway, and kynurenic acid (KYN) due to the action of the enzyme indoleamine 2,3-dioxygenase (IDO). The role of neurotoxic metabolites in depression is supported by studies showing upregulated levels of peripheral and central KYN and increased QUIN in the CNS, correlating with IFN-α induced depression Raison et al. (2010). Further evidence of the role of IDO and KYN in depression comes from preclinical studies showing an induction of depression-like behavior after administration of L-kynurenine (L-KYN). This review aims at discussing the role of kynurenine in depression and the significance of blocking the metabolites of this pathway in the treatment of depression.

Key words: Inflammation, Indoleamine 2,3- dioxygenase, Kynurenine, and Depression.

References

Effect of aqueous extract of cowpea (vigna unguiculata) (l) walp) on visuospatial learning and memory in acute lead induced neurotoxicity in mice

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Background: Lead is a poisonous metal, which exist in both organic (Tetraethyl lead) and inorganic (lead acetate and lead chloride) forms in the environment Shalan et al., (2005). Exposure to lead mostly occurs through the respiratory and gastrointestinal systems. This affects many biological activities at the molecular, cellular and intercellular levels, which may result in morphological alterations that can remain even after lead level has fallen Flora et al., (2006); Ibrahim et al., (2012). Aim and Objectives: To assess the effect of Cowpea (Vigna unguiculata (L) walp) on learning and memory in acute lead-induced neurotoxicity in mice using Morris water and Barnes mazes. Methodology: The LD50 of the aqueous extract of Vigna unguiculata was determined using the method described by Lorke (1983) in mice. The neurobehavioural studies was conducted using Morris water and Barnes mazes paradigms respectively at the doses of 250, 500 and 1000 mg/kg of the extract. Results: No sign of toxicity was observed in all the animals in the groups during the two phases of the toxicity study. The oral median lethal dose (LD50) value in the mice was estimated to be greater than 5000mg/kg. However, during the two day training sessions in Morris water maze, there was no significant difference in performance (latency to find the escape platform) in the Vigna unguiculata treated groups when compared with the control f = (4.20) = 3.451, p = 0.2 0. The result was also similar in Barnes maze paradigm in both day one and two, F (4,20) = 0.857, P = 0.506. Conclusion: Vigna unguiculata at the doses administered has no effect on learning and memory in acute lead induced neurotoxicity in mice, but that does not mean it lacks total therapeutic benefit.

References

Effects of Lycopene on Liver Function Parameters and Glucokinase Activity in Experimentally-induced Diabetes Mellitus in Wistar Rats

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The study examined the effect of lycopene on liver function parameters and glucokinase activity in experimentally-induced diabetes in Wistar rats. Diabetes was induced by single intra-peritoneal administration of streptozotocin (60 mg/kg b w) into animals. Diabetic and normal animals were randomized into the following groups: Group I: Normal control rats that received (0.5 mL) of olive oil; Group II: Diabetic control animals that received (0.5 mL) of olive oil); while Group III- VI received (10, 20 and 40 mg/kg of lycopene and 2 mg/kg of glubilcanbamide) respectively. All treatments were given orally once daily for four weeks. There was a significant (P < 0.05) reduction on blood glucose concentration, with non-significant (P > 0.05) increase in serum insulin level when compared with diabetic control group. There was a significant (P < 0.05) increase in the activity of liver glucokinase enzyme and a significant (P < 0.05) decrease on the activities of serum liver enzymes (AST, ALT and ALP) in diabetic animals administered with lycopene when compared with diabetic control animals. Following available evidence from our findings, lycopene may be suggested as a promising dietary agent in the management of diabetes and hepato-cellular damage that usually occurs in diabetes mellitus.

References

Outcome of Sub-acute Insulin Administration on Long-Term Visio-Spatial and Short-Term Working Memory in Mice

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In the past, insulin was considered a peripheral hormone, unable to affect the central nervous system. Now, it is well established that insulin occurs in the brain where it exerts regulatory and trophic effects. This study was undertaken to determine the effect
of sub-acute insulin administration on long-term visio-spatial and short-term working memory. Twenty four mice, weighing between 18 – 22 g, were used. Two groups of six mice each were used during elevated plus maze and Y-maze, to determine long-term visio-spatial and short-term spatial working memory, respectively. Control group received deionized water, while insulin group received insulin at 10 IU/kg/day, subcutaneously. In the elevated plus maze, acquisition and retention latencies were the same (P > 0.05) when compared between groups. In the Y-maze test, number of entries into arms was similar (P > 0.05) within and between groups. Time spent in the novel arm by mice in the insulin (103.83 ± 7.4) and control (108.00 ± 13.6) groups was higher (P < 0.05) when compared to arm A (68.33 ± 10.0 and 74.50 ± 5.6, respectively) and B (59.17 ± 9.5 and 69.67 ± 10.7, respectively). Number of triads and percent alternations were also the same (P > 0.05) when compared between groups. It was concluded, that sub-acute insulin administration did not affect long-term visio-spatial memory and short-term working memory in mice.

Contrasting views on the role of mesenchymal stem cells in tumor progression: A systematic review
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The role of mesenchymal stromal/stem cells (MSCs) in tumor progression remains controversial. Strong experimental evidence supports both inhibitory and stimulatory roles for MSCs on tumor growth (Ljubic et al. 2013; Chao et al. 2012). To assess factors responsible for contrasting effects of MSCs on tumor growth, we did a systematic review of existing literature on the effect of MSCs on tumor growth from 01/01/00 to 01/05/16. A total of 168 original research articles with 315 experiments were assessed. Factors considered in the complex relationship between MSCs and tumor growth include: type of experiments (in-vivo, in-vitro), experimental models for the in-vivo studies (syngeneic or xenogeneic), immune status of the experimental animal (competent or deficient), sources and types of cancer and MSCs, status of the MSCs (naïve or engineered), methods of inducing cancer as well as methods of administering the MSCs in vivo and methods used in the in vitro experiments (co-culture or conditioned media). 55% of the studies favor the stimulatory effect of MSCs on tumor growth. The type of experiment is divided almost evenly, as about 53% of all the experiments were conducted in-vitro with 60% of the cancer cells were exposed to the MSCs via co-culture methods. 78% of the in-vivo experiments were xenogeneic and 63% of these were carried out in immunocompetent animals. About 80% of both MSCs and cancer cells were sourced from human and 86% of these MSCs were used in their naïve form while 14% were engineered to produce factors that could alter the activity of the MSC itself or that of the cancer cells. About 61% of the MSCs were derived from bone marrow while 15% each were derived from adipose tissues and umbilical cord; the remaining 8% MSCs were derived from various other tissues. Tumor growth was inhibited in 86% of experiments that used engineered MSCs. Tumor growth was inhibited in 82% of experiment that used umbilical cord MSCs while tumor growth was promoted in 62% of experiment that employed bone marrow MSCs, but the effect of MSCs on tumor growth was about 57% and 43% stimulatory and inhibitory respectively when adipose tissue derived MSCs were used. Thus several factors determine what effect MSCs would have on the progression of tumor growth.

Neuroblastoma cell lines with acquired resistance to tubulin-binding agents as a model system
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High risk neuroblastoma patients often die from a disease relapse after initial therapy response (Park et al. 2013). Chemoresistance can either be intrinsic or acquired; here, we investigated acquired resistance. Intrinsic resistance is exhibited by cancer cells that possess resistance-mediating factors pre-existing before therapy. Acquired resistance is developed by tumours that were initially responsive to chemotherapy. We characterised a panel of neuroblastoma cell lines with acquired resistance to tubulin-binding agents. Tubulin-binding agents belong to the most frequently used anti-cancer drugs (Jordan and Wilson 2004). They either inhibit microtubule formation (destabilising agents) or degradation (stabilising agents) thereby interfering with the dynamics required for microtubule function. This leads to disruption of the cell cycle, prolonged check-points and eventually, cell death. Neuroblastoma cell lines with acquired resistance to docetaxel (UKF-NB-3rDOC) or epothilone B (UKF-NB-3rEPO) (destabilising agents) were investigated against a range of stabilising and destabilising tubulin binding agents including newly synthesised drug candidates to establish cross-resistance profiles. MTT viability assays showed an overall decrease in sensitivity of UKF-NB-3rDOC cell lines and UKF-NB-3rEPO sublines to combretastatin-A4, its derivatives and the other agents. Furthermore, we established that adaptation of a cell line to the same drug in independent experiments results in varying sub-lines and not in the reproducible selection of a certain pre-existing resistant clone.

References

Steroidogenic activities of methanol extract of sida corymbosa leave in male wistar rats treated with lead acetate
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One of the mechanisms of action of lead acetate (Pb) in male reproductive toxicity is distortion in hypothalamic pituitary testicular axis. The present study was therefore designed to evaluate pituitary testicular axis and steroidogenic enzymes activities of methanol extract of Sida corymbosa leave in male Wistar rats treated with Pb. Forty-eight (48) male Wistar rats (130 to 170 g) were used for this study. The animals were grouped randomly into six (6) with 8 rats per group and treated as follows: control (vehicle), 15 mg/kg Pb, 100 and 200 mg/kg MSC, 15 mg/kg Pb co-administered with 100 and 200 mg/kg MSC respectively. All the administration were done orally for 54 days except Pb which was administered through intraperitoneal injection once every week of 54 days. Serum hormones (testosterone, FSH and LH), testicular androgen receptors and steroidogenic enzymatic activities were assays using ELISA, immunohistochemistry and spectrophotometry methods respectively. Lead acetate significantly reduced (p<0.05) serum testosterone, FSH, LH, androgen receptors expression, 3 and 17 β hydroxysteroid dehydrogenase and steroidogenic acute regulatory protein when compared with the control group. Methanol extract of Sida corymbosa significantly increased (p<0.05) FSH, 17 β hydroxysteroid dehydrogenase, testicular androgen receptors expression and steroidogenic acute regulatory protein relative to the control group. The extract significantly improved (p<0.05) serum testosterone, FSH, LH, androgen receptors expression and steroidogenic enzymes activities when co-administered with Pb
relative to the Pb group. Methanol extract of Sida corymbosa leaves may ameliorate lead induced reproductive damage in male Wistar rats through its steroidogenic activities and hypothalamic pituitary testicular axis.

References


Effects Of Methanol Extract Of Sida Corymbosa Leaves On Sperm Parameters In Male Wistar Rats Treated With Lead Acetate
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The effects of methanol extract of Sida corymbosa leaf (MSC) on sperm parameters in lead acetate (Pb) treated male Wistar rats were evaluated. Forty-eight (48) male Wistar rats (130 - 170 g) were used for the study. The animals were grouped randomly into six (6) with 8 rats per group and treated as follows: control (vehicle), 15 mg/kg Pb, 100 and 200 mg/kg MSC, 15 mg/kg Pb co-administered with 100 and 200 mg/kg MSC respectively. All administrations were done orally for 54 days except Pb which was administered intraperitoneally once every week for 8 weeks. Caudal epididymal sperm was analysed with computer aided sperm analyser and sperm acrosome status was evaluated using Coomassie brilliant blue stain while epidymid and testis histology were stained with H&E and PAS for total sperm storage and spermatogenesis assays respectively. Sperm concentration, progressive sperm motility, viability, normal sperm cells, average path velocity, amplitude lateral head, beat cross frequency line moving, mean move angle, acrosome reacted capacitated sperm, epididymal sperm storage and spermatogenesis were significantly reduced (p<0.05) in Pb treated group relative to control group. Two hundred mg/kg MSC significantly increased (p<0.05) sperm concentration and progressive sperm motility compared with control. Co-administration of Pb and the extract (100 and 200 mg/kg MSC) significantly increased (p<0.05) in progressive sperm motility, viability, normal sperm cells, average path velocity, amplitude lateral head, beat cross frequency line moving, mean move angle, acrosome reacted capacitated sperm, epididymal sperm storage and spermatogenesis compared to Pb group alone. The results suggest that methanol extract of Sida corymbosa leaves possess protective properties on spermatozoa of lead acetate treated male Wistar rats.

References


Effect Of Allium Sativum (Garlic) Extract On Pregnancy, Fetal Weights And Some Hematological Parameters In Female Wistar Rats
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Excessive weight gain during pregnancy has shown to increase blood volume, cardiac output and blood pressure during pregnancy and remains a global challenge even in the 21st century with attendant increase in mortality rate during child bearing. Hence, the quest for alternative management medication suffixed our investigation of the effect of allium sativum (garlic) on pregnancy, fetal weights and some hematological parameters. In this present study, 40 female wistar rats were divided into 4 groups of 10 rats each. Group A served as a normal control group and was fed with normal rats chow and clean drinking water ad libitum. Group B were induced with pregnancy and received 100mg/kg body weight of the allium sativum extract. Group C were also induced with pregnancy and received same dose of the extract as group B. Group D was non- pregnant group but received the same dose of the allium sativum extract as B and C respectively. Their body weights and hematological parameters (RBC, WBC, PLATELETS, HB and PCV) were accessed prior to commencement of the experiment and on weekly basis for 28 days. ANOVA was used to analyze the data and probability level of P<0.05 considered significant. Result of the study shows there was a significant decrease in the body weights of the groups (D>b>c>a0.05) between groups B,C and D when compared with control group A. Groups A & D showed a significant increase in the packed cell volume (PCV) while B and C decreased significantly. The Platelet counts decreased significantly in all the groups compared to group A and there was no significant difference (P>0.05). The fetal weights, decreased in the groups that received the allium sativum extract than those that did not receive it, though there was no significant difference between them(P>0.05). Therefore, the result of this study suggests that the consumption of garlic during pregnancy has a beneficial effect in the reduction of both maternal and fetal body weights and could serve as useful agent in the maintenance of blood parameters including the fasting blood sugar level.

References

Comparison of Anti-Oxidative Activity of Insulin, Ocimum gratissimum and Vernonia amygdalina in Type 1 Diabetic Rats
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Background: Diabetes mellitus (DM) is known to be associated with increase oxidative stress product. The direction of effect of any treatment on this product could therefore be a reliable measure of its efficacy or otherwise on DM.
Aim: To investigate the activity of insulin, Ocimum gratissimum (OG) and Vernonia amygdalina (VA) on oxidative stress products (RBC-catalase, methaemoglobin, sulphaemoglobin). Methods: Forty eight female wistar rats weighing 150 to 200g were randomly divided into eight groups of six rats each. Thirty rats were induced for diabetes with a single intraperitoneal injection of streptozotocin (STZ). Group 1 was normal control and was administered distilled water while group 2 and 3 served as non-diabetic group treated with OG (208mg/kg) and VA (52mg/kg) leaves extracts respectively. Group 4 served as diabetic control group (DMC). Group 5, 6, 7 and 8 were diabetic rats treated with OG (DM-T1), VA (DM-T2), OG+VA (DM-T3) and insulin (DM-T4) respectively. Determination of methaemoglobin and sulphaemoglobin was done by the absorption spectrum principle. RBC catalase was assayed by continuous spectrophotometric method. Results: There was a significant (p<0.05) increase in RBC catalase in DMC compared
to control. RBC catalase concentration in all the treated groups were significantly (p<0.05) lower than DMC. Methaemoglobin (MetHb) concentration in DMC was significantly (p<0.001) lower than control. MetHb concentration in non diabetic rats treated with OG and VA was significantly (p<0.05) lower than control. DM-T2 showed significant (p<0.05) reduction in MetHb concentration compared to DMC. Sulfhaemoglobin (SulfHb) concentration increased significantly (p<0.001) in DMC compared to control. There was a significant (p<0.05) reduction in SulfHb concentration DM-T1 (p<0.01) compared to DMC. Conclusions: DM appears to protect against the formation of MetHb but increases the concentration of RBC catalase and SulfHb. The anti-oxidant activities of the natural extracts were similar to that of insulin a standard drug treatment for type I DM.

References

Administration of Nicotinamide and Niacin Alleviates Oxidative Stress in Diabetic Rats
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Background: Oxidative stress appears to be the underlying pathogenesis mechanism for most diabetic complications. Nicotinamide and niacin are the same chemical compound with different formulations and possess antioxidant activity. Aim: This study was therefore designed to assess the effect of Nicotinamide and niacin on oxidative stress indices (RBC catalase, metHb and sulfHb). Methods: Twenty-four female albino wistar rats weighing between 150-200g were randomly divided into 4 groups of 6 rats each. Group 1 served as normal control and were administered distilled water. Groups 2, 3, and 4 were induced for diabetes with a single intraperitoneal administration of 65mg/kg body weight of streptozotocin (STZ). Group 2 served as diabetic control (DM-C), group 3 (DM-T1) was pre-treated with 100mg/kg body weight of nicotinamide before diabetes induction and group 4 (DM-T2) was pre-treated with 100mg/kg body weight of niacin before diabetes induction and continued daily for 28 days. Determination of methaemoglobin and sulfhaemoglobin was done by the absorption spectrum principle. RBC catalase was assayed by continuous spectrophotometric method. Results: There was a significant (p<0.05) increase in RBC catalase in DMC compared to control. RBC-catalase was significantly (p<0.05) reduced in DM-T1 and DM-T2 compared to DMC. There was a significant (p<0.05) reduction in metHb in DMC compared to normal control while DM-T1 and DM-T2 significantly increased metHb compared to DMC. MetHb was significantly (p<0.05) reduced in DM-T2 compared to DM-T1. There was a significant (p<0.05) increase in sulfHb in DMC compared to normal control. DM-T1 and DM-T2 significantly (p<0.05) reduced sulfHb compared to DMC. RBC-catalase and metHb were significantly (p<0.05) lower in DM-T2 compared to DM-T1. Conclusion: Diabetes increases oxidative stress indices (RBC catalase, metHb and sulfHb) and Nicotinamide and Niacin treatment ameliorated this derangement with Niacin being more potent. Niacin may serve as a potent adjuvant treatment in Diabetes mellitus.

References

Relationship between Haemoglobin Genotype, Incidence of Diabetes Mellitus and some Clinical Complications in Southern Nigeria Tertiary Health Institutions
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Background: Haemoglobinopathies are among the most common genetic disorders. There appears to be paucity of literature on the relationship between genotype, diabetes mellitus (DM) and its complications. Aim: This study was therefore aimed at investigating the relationship between haemoglobin genotypes, incidence of DM and some clinical complications
Method: The study adopted a cross sectional survey design and questionnaire was developed and filled accordingly. 445 subjects took part in the study with 244 making up the test group (diabetics) and 221 as the control group (non-diabetics). Subjects were interviewed and samples collected during their weekly clinic visit. Blood sample was collected by venepuncture and haemoglobin genotype was determined by electrophoretic method. Analysis was done to determine the blood sugar concentration in both groups. Other relevant data were obtained from Subjects case file. Data were analyzed using Instat graph pad 2.5a and Chi-square. Student’s T-test was employed to compare the two sets of data. Result: From the result, diabetics had a significantly (p<0.01) higher fasting and random blood sugar than the non-diabetics. The prevalence of diabetes mellitus with haemoglobin–AA genotype was significantly (p<0.01) higher than subject with haemoglobin–AS genotype compared to the study population percentage. Neuromuscular complication was significantly (p<0.01) higher than eye complication. Conclusion: From this result, it is evident that haemoglobin-AS (sickle cell trait) may protect against DM, within the limit of exclusion of other contributory factors. Neuromuscular complication was more common than eye complication.

References

Relationship between serum Iron, CRP and BMI in Saudi university females students
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Background: Both iron deficiency and obesity are global epidemics affecting billions of individuals. There is accumulating data that iron deficiency in obesity may be mediated by low grade chronic inflammation seen in individuals with excess weight. Objectives: The goals of this study were to: 1- Determine
the body mass index (BMI of Saudi females students 2- Measure the serum iron &CRP levels 3-Determine any significant correlation between serum iron &CRP levels with obesity. Methods: This was a cross sectional descriptive study conducted during the period of 2013-2014 among 33 females students from Dammam University Alneeria College age range (19-24) years. Their height &weight were recorded. BMI was calculated according to WHO using the formula of the weight divided by the height square. Obesity classification was based on WHO criteria. Levels of serum iron& CRP of the samples were assessed using Dimension RxL Max Integrated chemistry system. Statistical analysis was done by SPSS. Results: The prevalence of obesity among the participants was 57.6% (19 students). Obese female students showed lesser serum iron than normal female students (46.00±34.64µg/dl and 58.00±34.64µg/dl respectively P<0.05). The mean serum CRP was significantly greater among obese students than normal ones (0.35±0.544 mg/dl and 0.2±0.544 respectively . P<0.004) Serum iron showed significant negative correlation with the BMI (P<0.05) Serum CRP was positively and significantly associated with BMI (p value=0.05). Conclusion: Obesity is associated with low serum iron which may be attributed to obesity induced inflammation.

Gum Arabic as Novel anti-oxidant agent in Sickle Cell Anemia; in vivo study
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Introduction: Sickle cell anemia patients are characterized by hyperoxidative state which caused by chronic inflammatory state and self-oxidation of Hb S. Chronic oxidative stress contributes to endothelial dysfunction, inflammation and multiple organ damage in SCD. Medication increases the antioxidant capacity it will be beneficial. Gum Arabic (GA), is edible, dried, gummy exudates from Acacia Senegal tree. GA has been claimed to act as an anti-oxidant and cytoprotective agent and protect against experimental hepatic, renal and cardiac toxicities in rats. We hypothesized that regular intake of GA increases anti-oxidant capacity and reduce oxidative stress. Methods: 47 patients (5-42 years) carrying hemoglobin SS were recruited. Patients received 30/day GA for 12 weeks. Total anti-oxidant capacity (TAC), malondialdehyde (MDA) and hydrogen peroxide (H2O2) level were measured by spectrophotometric methods before and after GA intake. Results: Gum Arabic significantly increased TAC level P= 0.000. And decreased oxidative markers MDA and H2O2 (P= 0.045 and 0.004 respectively). Conclusion: GA has potent anti-oxidative properties as demonstrated by its ability to increase TAC and decreased oxidative stress markers in humans. This is a novel effect of GA as potent anti-oxidant agent that can be utilized in various clinical conditions and diseases characterized by increased lipid peroxidation and tissue injury.

Prevalence of metabolic syndrome in adolescents living in Mthatha – South Africa
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Background: Obesity in childhood and adolescence is associated with higher prevalence of chronic diseases of lifestyle. The metabolic syndrome is being increasingly mentioned among children and adolescence though there is no consensus on how it should be defined in this population. Given that similar measurements are used as risk factors for both the metabolic syndrome and atherosclerosis, this study was aimed at determining the prevalence of the metabolic syndrome and risk factors for atherosclerosis in adolescents living in Mthatha, South Africa. Methods: 13-18 year old male and female adolescents were recruited into this cross sectional cohort study. Anthropometric measurements (weight, height, waist and hip circumferences) were performed for each subject and fasting venous blood collected for lipid profile, c-reactive protein (hs CRP) and blood glucose analysis. Blood pressure was measured and metabolic syndrome was assessed using appropriate diagnostic criteria for children and adolescents. Results: 302 adolescents were recruited into the study. With the exception of BMI and LDL-C, all risk factors for the metabolic syndrome were elevated in the overweight/obese subjects compared to the lean and more so in the males. Of the 302 subjects 41.1% were overweight/obese (47.9% females; 22.5 males). Using two criteria for defining the metabolic syndrome was diagnosed in 3.3% female and 7.9% in male subjects vs 5.6% and 6.7% respectively.

A Preliminary Study on the Evaluation of Pulmonary Functions among Singers and Non-Singers in Ahmadu Bello University, Zaria.
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The physiology of singing involves the use of the lungs as well as accessory structures of respiratory tract. High lung volume has been associated with singers and decreased lung volumes with non-singers due to the rise or decent of the larynx. This study was aimed at investigating pulmonary function in singers and non-singers. Fifty-eight individuals voluntarily participated in the study and they were grouped into two groups (singers and non-singers; n=14 and males =14) and non-singers (n=30, females = 15 and males = 15). The exercise was carried out using the desktop Vitalograph according to ATS/ERS recommendations, in which the forced expiratory volume in one second (FEV1), forced vital capacity (FVC) and forced expiratory volume ratio and percentage (FEV1/FVC ratio and FEV1%) were studied. Anthropometric indices of singers and non-singers showed no significant difference when the two groups were compared except for age, which was significantly lower in singers (21.89 ± 0.48and 23.90 ± 0.42 years respectively). All pulmonary function parameters were significantly lower in non-singers: FEV1; 3.16 ± 0.12 and 2.56 ± 0.08 ml, FVC; 3.75 ± 0.11and 3.36 ± 0.08 ml, FEV1/FVC ratio; 0.84 ± 0.12 and 0.76 ± 0.01 and FEV1%; 83.99 ± 1.56 and 76.16 ± 1.20 % (P < 0.05). The subjects were further divided by sex into groups, the male singers and non-singers were matched anthropometrically, but FEV1, FVC, FEV1/FVC ratio and FEV1% were significantly higher in male singers (P < 0.05). While the female group FEV1, FEV1/FVC ratio and FEV1% were also significantly higher in the female singers (P < 0.05). This study found that singing has a positive effect on pulmonary function and can improve lung function.

Effect of Selected Vegetables on Blood Pressure and Cardiac Biomarkers in Myocardial Infarction – Induced Male Wistar Rats.
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Effects of five selected Nigerian vegetables extracts on blood pressure (BP) and cardiac biomarkers were investigated in isoproteenol (ISO)-treated (20 mg kg⁻¹ b.wt; subcutaneously) myocardial infarction (MI) male Wistar rats (Radhika et al., 2011). Dried ground leaves (350g each) of Basella alba Linn. var. alba, Crassocephalum crepidioides (Benth.) S. Moore Launaea taraxacifolia Amin Ex. C. Jeffrey, Senecio biafrae Oliv. & Hiern., and Solanum nigrum L., were each extracted with 3 litres of water using maceration techniques (Handa, 2008). Rats (150g – 200 g) randomized into 14 groups of 6 rats each, were fed rat pellet, water and vegetable extract for 28 days. Groups 1 and 8 served as normal and ISO controls respectively while groups 2 to 6 received 200 mg kg⁻¹ b.wt. of each vegetable. Groups 9-14 were pretreated with each vegetable extract and MI induced on days 29 and 30. Group 7 received a combination of all the extracts in ratio 1:1:1:1. Group 14 received extract combination and ISO. Thereafter, BP was measured via arterial cannulation. Lactate dehydrogenase (LDH) and C-reactive protein (CRP) were measured in cardiac homogenates. CRP, LDH and BP fell (p<0.05) in all vegetable pre-treated groups with mixture group displaying the lowest activities of CRP. Pre-treatment with vegetables abolished the increases in CRP, LDH and BP (p<0.05) due to ISO. Results suggest that the selected vegetable extracts reduced BP and improve cardiac functions in ISO-induced myocardial infarction male rats.

References


Cimetidine at therapeutic dose induces derangements in serum levels of some male sex hormones: ameliorative effect of vitamin C

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Cimetidine is a potent histamine H2-receptor antagonist widely used in treatment of peptic ulcer disease. The aim of this study was to evaluate the effect of chronic cimetidine treatment at therapeutic dose on serum levels of testosterone, FSH, LH and estradiol and possible ameliorative effect of vitamin C on any derangements induced by cimetidine treatment. Forty adult male Wistar rats were divided into four groups (n = 10) and treated orally for 60 days with distilled water (control); cimetidine (30 mg kg⁻¹); cimetidine (30 mg kg⁻¹) + vitamin C (25 mg kg⁻¹) and cimetidine (30 mg kg⁻¹) + vitamin C (50 mg kg⁻¹). At the end of the study each animal was anaesthetized by chloroform inhalation in a gas chamber and blood was collected by heart puncture. Serum testosterone, FSH, LH and estradiol levels were determined using commercially available kits. Serum levels of testosterone (5.11 ± 0.89), FSH (4.07 ± 0.16) and estradiol (3.13 ± 0.08) of the cimetidine-treated group was higher than that of the control (1.94 ± 0.53, 1.96 ± 0.04 and 1.52 ± 0.23, respectively), while the value for LH of the two groups was not significantly different. Treatment with vitamin C reversed the cimetidine-induced increase in the levels of these hormones. It was concluded that chronic cimetidine administration at therapeutic dose increased serum levels of testosterone, FSH and estradiol, but not LH and vitamin C at the dose of 25 mg kg⁻¹ co-administered with cimetidine ameliorated these negative effects.

References


Effects of Ethanolic Extract of Moringa oleifera (Lam.) Seeds on Some Markers of Renal Function and Electrolytes in Wistar Rats.

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Background: Most literatures attribute the medicinal benefits of Moringa oleifera to its therapeutics and pharmacological values. However, the effects of ethanolic extract of the seeds of this plant on renal function have not been reported, hence this study.

Objective: To study the effect of ethanolic extract of the seeds of Moringa oleifera (EEMOS) on the renal functions of rats. Methods: A total of 35 male Wistar rats, housed in separate metabolic cages, were divided into 4 groups as follows; Group 1 (control group) consisted of 5 rats received propylene glycol for 28 days. Group 2, 3 and 4 consisted of 10 rats each, received EEMOS orally for 4 weeks at graded doses of 100, 200 and 400 mg/kg respectively. Five rats from each group were sacrificed under ketamine anesthesia 24 hours after the last administration of EEMOS. The remaining 5 rats were sacrificed after 2 weeks recovery period. Results: EEMOS administration for 28 days induced no significant differences in the plasma and urine levels of creatinine, urea, sodium and chloride (P > 0.05) as well as renal histoarchitecture in the experimental groups, when compared with the control group. There was a significant reduction in the plasma level of potassium (P < 0.05) with no significant difference in its urine level in the experimental groups when compared with the control group.

Conclusion: EEMOS has no appreciable adverse effects on the renal function and plasma electrolyte balance of Wistar rats.

References:


Moringa oleifera leaf extract ameliorates the genotoxic effects of hydroxyurea in phenylhydrazine induced anaemia in rats.

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Hydroxyurea (HU), used in the management Sickle Cell Anaemia may have toxic effects on the subjects. This study sought to investigate whether Moringa oleifera leaf extract (MOLE) can mitigate the genotoxic effects of HU in phenylhydrazine (PHZ)-induced anaemia in rats. MOLE was obtained using 80% methanol after leaf maceration. Thirty-six male Sprague Dawley rats were distributed into 6 groups of six animals each and labeled groups I-VI. Group I (control) did not receive any extract or drug. Anaemia was induced in groups II-VI by intraperitoneal administration of PHZ (20 mg/kg-1 body weight) on alternate days for 9 days. After PHZ treatment, group III received HU (25mg kg⁻¹). Groups IV-VI received three different doses of MOLE (100, 200 or 400 mg/kg-1) and HU (HUMO) once daily orally for ten days. After treatment, blood was collected by ocular puncture for haematological analysis and animals sacrificed by cervical
dislocation to harvest liver for the determination of malondialdehyde (MDA) levels and DNA fragmentation analysis. PHZ decreased packed cell volume (PCV), red blood cells (RBCs) and haemoglobin (Hb) (p<0.05) and increased MDA levels and DNA fragmentation. After PHZ treatment, HU increased PVC, Hb, MDA and DNA fragmentation but decreased RBC levels (p<0.05). Dose dependently HUMO (groups IV – VI), increased PCV, RBC and Hb and reduced MDA and DNA fragmentation. Study shows that MOLE ameliorated the genotoxic effects of HU in PHZ-induced anaemia in rats.

References:


**Gastro-protective Effect of Methanolic Extract of Vernonia amygdalina (Del.) Leaves on Aspirin-Induced Gastric Ulcer in Female Wistar Rats**

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This study investigated the protective effects of methanol extract of Vernonia amygdalina leaves on aspirin induced gastric ulcer in female rats. Fifty-five female Wistar rats, 120 – 200g were divided into 5 groups as follows: Group 1 (control) (n=5) rats received 2 ml/kg of propylene glycol for 28 consecutive days. Group 2 (n=10) received 150 mg/kg/day of aspirin suspended in 3 ml of 1% carboxymethylcellulose in water orally for 3 consecutive days during which the rats were fasted for the induction of ulcer. Groups 3, 4 and 5 (n=10 each) received Vernonia amygdalina (MEVA) orally at 100, 200 and 400 mg/kg/day respectively for 28 consecutive days and thereafter were treated with aspirin as group 2. Group 6 (n=10) received cimetidine at 100 mg/kg/day orally for 28 consecutive days and thereafter were treated as group 2. Five rats from each group were sacrificed 24 hours after the induction of ulcer and the remaining 5 rats were sacrificed after a 2-week recovery period to determine the gastric pH, gastric acidity, gastric ulcer score, haematological indices, SOD, GSH and MDA. The result showed that aspirin significantly caused alteration in gastric pH, ulcer score, gastric acidity, SOD, GSH and MDA levels (p < 0.05). It induced significant necrosis of the stomach tissue. MEVA administration significantly increased gastric pH, but decreased gastric acid secretion and reversed alteration of haematological parameters (p<0.05). It significantly increased activities of SOD, GSH and decreased MDA levels (p<0.05). In conclusion, Vernonia amygdalina possesses protective effects against aspirin-induced gastric ulcer.

**Elevated maternal testosterone causes insulin resistance, atherogenic dyslipidemia and poor pregnancy outcome: the role of mineralocorticoid receptor activation**

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Objective: Elevated maternal testosterone levels have been associated with pathological pregnancies such as preeclampsia which cause fetal growth restriction and increase the risk of development of cardiometabolic disorders in adult life (Salamaleks et al. 2008). This study sought to investigate the effect of elevated maternal testosterone on insulin sensitivity, atherogenic lipids, pregnancy outcome, proinflammatory and prothrombotic biomarkers. We also tested the hypothesis that these effects would be due to activation of the mineralocorticoid receptor (MR). Design and method: Pregnant Wistar rats received olive oil (vehicle, s.c.), testosterone propionate (0.5mg/kg b.w., s.c.), spironolactone (MR blocker; 25.0mg/kg b.w., p.o.) or testosterone-spironolactone between gestational days 15 and 19. Insulin resistance (IR) was estimated by homeostatic model of assessment (HOMA-IR). Triglyceride/high-density lipoprotein-cholesterol (TG/HDLC) and total cholesterol/high-density lipoprotein-cholesterol (TC/HDLC) ratios were estimated as indices of atherogenic dyslipidemia. Circulating proinflammatory (uric acid and C-reactive protein) and prothrombotic (plasminogen activator inhibitor-1; PAI-1) biomarkers were also evaluated. Result: The results showed that elevated maternal testosterone led to increase in fasting glycemia, insulinemia, 1-hour postload glycemia, IR, atherogenic dyslipidemia, PAI-1 and fetal resorptions. Conversely, elevated maternal testosterone led to decreased fetal weight, placenta weight and number of fetus, whereas proinflammatory biomarkers were unaffected. However, MR blockade led to improvement in IR, atherogenic dyslipidemia, prothrombotic biomarker and pregnancy outcome. Conclusion: These results demonstrate that elevated maternal testosterone causes increased IR, atherogenic dyslipidemia, prothrombotic biomarker and poor pregnancy outcome through MR activation. The data also indicate that these effects were independent of circulating proinflammatory biomarkers.

Reference


**Effects of aqueous extract of Citrullus lanatus fruit on antioxidant activities and reproductive functions in arsenic-treated male Wistar rats.**

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The present study investigated the effects of aqueous extract of Citrullus lanatus fruit (ACEL) on antioxidant activities and reproductive functions in arsenic (As2O3) treated Wistar rats. Thirty-six male Wistar rats weighing 150-190 g were randomly grouped into six and treated as follows; group 1 (control) was administered distilled water, group 2 was administered 3 mg/kg As2O3, groups 3 and 4 were administered 200 and 100 mg/kg AECL while groups 5 and 6 were treated with As2O3 and co-administered with 200 and 100 mg/kg AECL. All administration was done orally for thirty days. The animals were sacrificed by cervical dislocation. Testicular antioxidant activities, hormones level and Sperm analysis were determined by spectrophotometry, ELISA and microscopy methods respectively. There was a significant increase (p<0.05) in malondialdehyde level in As2O3 group compared with control while a decrease (p<0.05) was observed in the groups administered with 200 and 100 mg/kg AECL+As2O3 compared with the arsenic group. Superoxide...
Molecular characterization of the adipose tissue and pathophysiology of pansteatitis in the Nile crocodile (Crocodylus niloticus)

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Background: Pansteatitis is the widespread inflammation of adipose tissue, the common lesion responsible for the death of Nile crocodiles along the olifant river. Kruger National Park, Mpumalanga, South Africa in 2008/9. In an attempt to unravel the pathophysiology of pansteatitis; a study of the histomorphology, ultrastructure, molecular biology, and long chain fatty acid composition of adipose tissue from healthy farm bred crocodiles and from pansteatitis samples was undertaken. Methods: Adipose tissue samples were collected from the subcutaneous, visceral, intramuscular fat and the abdominal fat body of ten, 4 years old juvenile crocodiles from Izhinaha Crocodile Farm (Pty) Ltd, Pretoria. Pansteatitis samples were collected from visceral and intramuscular fat of crocodiles that died of pansteatitis at the olifant river. Histology, fatty acid methyl ester (FAME) analysis and molecular characterization using Trueq stranded total RNA library preparation and sequencing on Illumina HiSeq 2500 were performed.

Results: Histomorphology revealed regional variations in adipocytes shape, collagen and blood vessel distribution between the abdominal fat body and the other adipose tissue in healthy animals, while pansteatitis samples showed considerable inflammatory cell infiltration and fibrosis. FAME analysis showed higher composition of saturated and monounsaturated but lower polyunsaturated fatty acid in pansteatitis samples. From de novo assembly of the transcripts from the sequenced reads using Bridger 37,835 (90%) transcripts were mapped successfully with salt-water crocodile (Crocodylus porosus) genes. 70 genes were shown to be differentially expressed in pansteatitis samples, using RSEM. Discussion: Regional variation in histomorphology of adipose tissue was an interesting observation. The upregulated genes in pansteatitis and the processes they control may hold the key to understanding the pathophysiology of pansteatitis. Conclusion: The study provided an insight into the mechanism involved in pansteatitis, data for further study on Nile crocodile biology and a platform for complete genome sequence in the future.

Polyphenol-Rich Extract of Zingiber officinale (Rosco) Rhizome Improves Fractional Excretion of Sodium and Potassium in Wistar Rats with Cyclosporin-Induced Kidney Injury

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Cyclosporin is a common immuno-suppressing agent with clinical relevance following solid organ transplants, but associated with nephrotoxicity. The health impact of relatively cheaper and easily accessible natural products of plant origin should be explored, especially in a world with increasing incidence of kidney injury. The effects of polyphenol-rich extract of Zingiber officinale (PEZO) on the fractional excretion of Na+ and K+ in rats with cyclosporin (CYP)-induced kidney injury was determined. Fifty male rats of about 2.5 months old, 120 – 150 g, were used for this study such that graded doses of PEZO were administered following CYP-induced kidney injury and comparisons were made against a control, toxic and a toxic + recovery group at p < 0.05. The synthetic drug (CYP, 50 mg/kg p.o. for 10 days) as well as PEZO (100, 200 and 400 mg/kg p.o. for 21 days) was administered to the rats at 0.2 mL/100g. CYA induced nephrotoxicity as evidenced by significantly lowered creatinine clearance (p < 0.05); perturbation in both plasma and urine levels of Na+ and K+ as well as fractional excretion of Na+ and K+ (p < 0.05); and deleterious alteration in GSH and SOD levels (p < 0.05). Histopathological examination showed features of interstitial and tubular vacuolation with atrophic glomeruli. These conditions were significantly reversed (p < 0.05) following PEZO administration. It was, therefore, concluded that PEZO can potentially be a suitable therapeutic choice to reverse deleterious alterations in fractional excretion of Na+ and K+ in patients with CYP-induced kidney injury.

References:

Anti-hyperlipidemic and renoprotective effects of Bridelia micrantha leaf extract in salt-induced insulin resistance are accompanied by improved cardiac glycogen synthase kinase-3 in female Wistar rats

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Excessive salt intake has been reported to induce insulin resistance (IR) and hypertension in rodents (Ogihara et al., 2001, Sofola et al., 2002). For millennia, medicinal plants have been a valuable source of therapeutic agents and still many of today’s drugs are plant-derived natural products and their derivatives (Newman and Cragg, 2012). The study was designed to investigate the anti-hyperlipidemic and renoprotective effects of the methanolic leaf extract of Bridelia micrantha (B. micrantha) in salt-induced insulin resistance IR in female Wistar rats. IR was investigated by homeostasis model of assessment for IR (HOMA-IR) and triglyceride-glucose (TG/G) index. Triglyceride (TG)/HDL-cholesterol (HDL-C) and total cholesterol (TC)/HDL-
C ratios were also assessed as the atherogenic indices of plasma (AIP). Plasma levels of urea and uric acid were employed as indicators of renal function. Plasma and cardiac glycogen synthase kinase-3 (GSK-3) levels were determined by ELISA. Feeding rats with a high-salt (8%) diet resulted in significant increases in HOMA-IR, TyG index, TG/HDL-C ratio, TC/HDL-C ratio, plasma urea and uric acid levels, with a decrease in cardiac GSK-3 level. On the other hand, oral administration of B. micrantha or metformin ameliorated these alterations, comparatively. In conclusion, results from the present study suggest that B. micrantha has anti-hyperlipidemic and renoprotective potentials are accompanied by improved cardiac GSK-3 level.

References

Effect of Tulbaghia violacea on the blood pressure and heart rate in male spontaneously hypertensive Wistar rats
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Tulbaghia violacea Harv. (Alliaceae) is a small bulbous herb which belongs to the family Alliaceae, most commonly associated with onions and garlic. In South Africa, this herb has been traditionally used in the treatment of various ailments, including fever, colds, asthma, paralysis, hypertension and stomach problems. The aim of this study was to evaluate the effect of methanol leaf extracts (MLE) of Tulbaghia violacea on the blood pressure (BP) and heart rate (HR) in anaesthetized male spontaneously hypertensive rats; and to find out the mechanism(s) by which it acts. The MLE of Tulbaghia violacea (5–150 mg/kg), angiotensin I human acetate salt hydrate (ang I, 3.1–100 μg/kg), angiotensin II human (ang II, 3.1–50 μg/kg), phenylephrine hydrochloride (phenylephrine, 0.01–0.16 mg/kg) and dobutamine hydrochloride (dobutamine, 0.2–10.0 μg/kg) were infused intravenously, while the BP and HR were measured via a pressure transducer connecting the femoral artery and the Powerlab. Tulbaghia violacea significantly (p < 0.01) reduced the systolic, diastolic, and mean arterial BP; and HR dose-dependently. Ang I, ang II, phenylephrine and dobutamine all increased the BP dose-dependently. The hypertensive effect of ang I and the HR-increasing effect of dobutamine were significantly (p < 0.01) decreased by their co-infusion with Tulbaghia violacea (60 mg/kg). However, the co-infusion of ang II or phenylephrine with Tulbaghia violacea (60 mg/kg) did not produce any significant change in BP or HR when compared to the infusion of either agent alone in the same animal. Tulbaghia violacea reduced BP and HR in the SHR. The reduction in BP may be due to actions of the MLE on the ang I converting enzyme (ACE) and β1 adrenoceptors.

Gastroprotective effect of folic acid and omeprazole: roles of neutrophil-lymphocyte ratio, c - reactive protein and BCI-2
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Although the gastroprotective potential of folic acid has been reported, little is known about the role of inflammation and apoptosis in the said activity. This study, therefore, assessed Neutrophil-lymphocyte ratio (NLR) and C-reactive protein (CRP) and BCI-2 in ethanol-induced gastric ulcer pretreated with Folic acid (FA) and Omeprazole (OMEP). Thirty five (35) adult male Wistar rats weighing between 180-250 grams were used for this work. The rats were divided into seven groups of five rats each viz: (1) Overall control group (2) Ulcer control group (treated with ethanol only), (3) 2FA (2 mg/kg folic acid + ethanol), (4) 3FA (3 mg/kg folic acid + ethanol), (5) OMEP (20 mg/kg omeprazole + ethanol), (6) 2FA + OMEP (2 mg/kg folic acid and 20 mg/kg omeprazole) + ethanol and (7) 3FA + OMEP (3 mg/kg folic acid and 20 mg/kg omeprazole) + ethanol. The rats were treated with FA and OMEP for 21 days and 7 days respectively before ulcer induction. Blood samples were collected via cardiac puncture for haemocytometry, and analysis of serum CRP concentration via agglutination method. Paraffin gastric sections were stained with H&E for cyto-architectural alteration and inflammatory cells infiltration score, then immunostained for BCI-2. Ethanol caused gastric lesion with an index of 3.0 ± 0.2. Ulcer severity was significantly decreased in the 2FA, 3FA, OMEP, 2FA+OMEP and 3FA+OMEP treated groups (26%, 30%, 56%, 66.7% and 70% respectively). White blood cell concentration decreased in all the treated groups when compared with the ulcer control group. Similarly, NLR was reduced significantly in the 2FA, 3FA, OMEP and OMEP+3FA group (3.4±0.2, 4.3±1.5, 7.2±0.5 and 8.9±2.5 versus 11.9±1.4 of the ulcer control group). Qualitatively, there was absence of C-reactive protein in the 2FA group while quantitatively, presence of CRP appeared sustained in the 3FA and OMEP treated groups. Also, there was reduced inflammatory cell infiltration score in all the treated groups when compared with ulcer control. The expression and labeling index of BCI-2 were significantly enhanced more in the FA and OMEP combination than OMEP alone. Hence, it can be concluded that folic acid ameliorates the development of gastric ulcer in rats via reduced Neutrophil-lymphocyte ratio, reduced C-reactive protein concentration and enhanced BCI-2.

References

Suitability of octanoylcarnitine + malate for assessment of beta-oxidation capacity by respirometry in aconitase-inhibited samples
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The capacity of cells to oxidize fatty acids is often measured by respirometry using acyl carnitines + malate as substrates [1]. Inclusion of malate as a co-substrate is essential to prevent feed forward inhibition of beta oxidation arising from matrix CoA depletion [2]. Oxaloacetate from malate dehydrogenation condenses with the beta-oxidation-derived acetyl-CoA to form citrate and CoA. Therefore, as long as citrate does not accumulate in the mitochondrial matrix, beta-oxidation reactions proceed unhindered. However, a number of disease conditions are known to inhibit mitochondrial aconitase, an enzyme that has profound effects on citrate metabolism [3, 4]. The purpose of this study was therefore to investigate the validity of β-oxidation assessment by respirometry using...
octanoylcarnitine + malate in rat soleus muscle when mitochondrial aconitase is chemically inhibited by oxalomalic acid. Our results indicate that a 25% aconitase inhibition does not decrease oxygen flux at all respiratory states but increases citrate levels in the mitochondrial media by 40% compared to controls. However oxygen fluxes were significantly diminished at OXPHOS and ETS respiratory states by ~50% when MCAD, a rate limiting beta-oxidation enzyme, was inhibited 2-mercaptoacetate.

Taken together, our data indicate that in respirometric assays, use of octanoylcarnitine + malate allows for a valid assessment of beta-oxidation capacity in skeletal muscle under conditions where mitochondrial aconitase activity is compromised.


Zhang et al., (2007). Mitochondrial dysfunction due to long-chain Acyl-CoA dehydrogenase deficiency causes hepatic steatosis and hepatic insulin resistance. Proc Natl Acad Sci USA 104, 17075-17080


Comparative Effect of Aqueous Extracts of Brachystegia Eurycoma, Detarium Microcarpum and Mucuna Prurien on the Sperm Parameters and Testosterone Level on Male Wistar Rats

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A body of data suggests that poor semen quality is markedly increasing and is likely to be a contributing factor to a decline in human fecundity (Skakkebaek et al., 2006). Many people still think of infertility as a “woman’s problem”, in about 40% to 50% of infertile couples, the man is the sole cause or a contributing cause of the inability to conceive (Brugh & Lipshultz, 2004). In this present study, the comparative effect of aqueous extract of BE, DM and MP on the sperm parameters and testosterone level of male wistar rats was investigated. 25 adult male wistar rats were used and were divided into 5 groups of 5 rats each. Control group received distilled water, group I = 200mg/kg BE, group II = 200mg/kg DM, group III = 200mg/kg MP, group IV = 200mg/kg BE + 200mg/kg DM + 200mg/kg MP. All administrations were done orally for 14 days. 24 hours after the last treatment, the rats were anaesthetized using chloroform. Blood samples were obtained via cardiac puncture for testosterone assay. The testes were removed along with the caudal epididymis for analysis of sperm characteristic. Statistical analysis showed that the sperm motility, sperm count, normal sperm morphology, sperm viable cells and testosterone level of rats in all experimental groups were significantly increased (p<0.05) compared to the control group. However, there was more increase (p<0.05) in group IV when compared to the other experimental groups. In conclusion co-administration of the aqueous extracts of BE + DM + MP have been proven based on results obtained to improve sperm parameters and testosterone levels, hence can be said to have a significant increase on male fertility.

References:


Comparative Effect of Ethanolic Extracts of Tetrapleura Tetraptera Seed and Bark on the Thyroid Functions of Clomiphene Citrate Treated Female Wistar Rats

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Clomiphene citrate (CC) is a nonsteroidal selective estrogen receptor modulator (Clark & Markaverich, 1981; Nelson et al., 1990), which is highly effective in inducing ovulation in females with anovulation. Use of this drug in treatment of infertility has an agonistic effect on the hypothalamus which also shares a connection with the thyroid gland and may lead to thyroid disorder. The aim of this study was to examine the comparative effect of ethanolic extracts of Tetrapleura tetraptera (TTE) seed and back on the thyroid function in CC treated female wistar rats. 24 female wistar rats weighing between 150g to 230g were used in this study. They were grouped into 6 groups with 4 wistar rats respectively according to individual phase of oestrus cycle. Oestrus cycles of the rats were monitored between 7:00am to 9:00am for 14 consecutive days. Group I (control rats) received only rat feed and water. Group II were orally administered with 1mg/kg of CC, Group III received 200mg/kg ethanolic extract of TTE back, Group IV received 50mg/kg ethanolic extract of TTE seed, Group V received 1mg/kg of CC + 200mg/kg ethanolic extract of TTE back, Group VI received 1mg/kg of CC + 50mg/kg ethanolic extract of TTE seed for 14 days. Result showed that thyroid hormones (T3 & T4) level respectively were significantly higher (p<0.05) in experimental groups; II (15.50 ± 2.10) (117.50 ± 3.00 ± 1.30) showed statistical significant decrease (p<0.05) compared to control group I (7.60 ± 0.60) (73.40 ± 9.40) when compared with Control Group I (7.60 ± 0.60) (73.40 ± 1.90). However, experimental groups V (6.20 ± 0.05) (64.80 ± 9.40) and VI (5.60 ± 0.60) (63.00 ± 1.30) showed statistical significant decrease (p<0.05) compared to control group I (7.60 ± 0.60) (73.40 ± 1.90). These findings showed that ethanolic extracts of TTE seed and bark as well as CC individually produced hyperthyroidism. Whereas, CC + ethanolic extracts of TTE seed and bark synergistically produced marked reduction in thyroid hormones in non-pregnant female wistar rats.

References:


Impact Of Occupational Noise On Blood Pressure And Heart Rate Of Workers In Lagos, South West Nigeria

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This study was designed to investigate the effect of long term exposure to occupational noise on blood pressure and heart rate of workers in Lagos, South West Nigeria. A cross sectional study was conducted on 90 noise exposed and 30 unexposed male and female workers within 29-50 year age group selected from different work environments. The blood pressure (BP) and Heart rate (HR) of the three different groups of workers exposed to noise levels above 65dBA for 6 to 12 hours per day in 5 to 6 days...
for 1 to 7 years were studied and compared with those of the unexposed workers. Data analysis was carried out with ANOVA test, with significance level at P<0.05. Mean SBP, DBP and MABP were found to be significantly higher in the 3 noise exposed groups of workers compared with the unexposed group. Similarly, mean HR was found to be significantly higher in only 2 of the three noise exposed workers when compared with the unexposed group. However, only 9(10%) were found to be hypertensive, while 32(35.6%) were prehypertensive and 49(54.4%) had normotensive SBP. None (0.0%) of the control subjects had elevated BP. We conclude that chronic exposure to occupational noise results in significantly higher SBP, DBP, MABP and HR in noise exposed workers when compared with unexposed workers. We therefore recommend that exposure to occupational noise be minimized at workplaces.

Reference:

Watermelon juice modulates fructose-induced placental oxidative stress.
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Nutrition in pregnancy can provoke long-term effects on placental growth and health of offspring (Vickers et al. 2011). Effects of maternal high fructose intake and watermelon juice on placental morphology and oxidative status were investigated. Twenty pregnant rats were randomly assigned into four groups (n=5) and treated from gestation day (GD) 1-21 as follows; Control (water), Fructose (10% w/v), Watermelon juice (50% v/v) and Fructose + Watermelon juice. Caesarean section was performed on GD 21 under thiopentone anesthesia (i.p., 50mg/kg). (Pereda et al. 2006) during which the placentas were harvested. Placental morphology, oxidative status and histology were assessed. Data were analyzed using ANOVA and p<0.05 was considered statistically significant.

There was a significant reduction in placental weight and circumference, and an increase in placental thickness in the fructose group compared with the control. Placental superoxide dismutase, reduced glutathione and catalase activities decreased in the fructose group and increased in the fructose + watermelon group compared with the control and the fructose groups respectively. Levels of placental malondialdehyde increased in the fructose group and decreased in fructose + Watermelon group compared with the control and the fructose groups respectively. Placental histology of fructose group showed moderate congestion and severe infarction of chorionic villi. It is concluded that watermelon juice ameliorated fructose-induced changes in placental morphology and oxidative stress.

References


Fasting serum insulin among type 2 diabetic patients in Kano, North Western Nigeria
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Background: Type 2 diabetic patients may present with either of low or high insulin levels indicating β – cell malfunction or insulin resistance, but detailed assessment of the hormone in routine patient management is often overlooked especially in poor resource settings. This study aimed at estimating insulin levels of type 2 diabetic patients in Kano, Nigeria to characterize the patients and establish baseline for effective patient management. Methodology A descriptive cross-sectional design was used to study a random sample of 183 type 2 diabetic patients in Kano, Nigeria. Fasting blood glucose was estimated using glucose oxidase method. Serum Insulin level was estimated using enzyme linked immune-sorbent assay (ELISA) kits. Data was analyzed using mini tab statistical software. HOMA IR score was used to determine insulin resistance in this study subjects. Result: The mean fasting insulin levels (± S.E) for the respondents was 4.49 ± 0.01 and higher in the male patients (4.49 ± 0.01). The mean HOMA- IR scores (± S.E) for the female and male patients was 1.81 ± 0.05 and 1.90 ± 0.07 respectively (p = 0.001). The mean fasting blood sugar levels (± S.E) between the male and the female diabetic subjects was (4.49 ± 0.01 and 4.46 ±0.01) respectively. Conclusion: The study observed hypoinsulinemia and insulin resistance in the subjects suggesting that a combination of insulin replacement, treatment with drugs that improve insulin sensitivity and/or physical exercise has more potential for treatment of such patients than single drug therapy.

Plasminogen activator inhibitor-1 is an independent determinant of high pulse pressure in sickle cell anemia
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Background: Sickle cell anemia (SCA) patients do not suffer from arterial hypertension in spite of high incidence of cardiovascular disease (CVD). However, some SCA patients have elevated pulse pressure (PP), which is a surrogate of arterial stiffness and an independent risk factor for CVD (Novelli et al., 2014). Studies have reported that elevated level of plasminogen activator inhibitor-1 (PAI-1) is associated with an increased risk of CVD (Van De Craen et al., 2012). Aim: We hypothesized that PAI-1 would be an independent determinant of elevated PP in young adults with SCA in steady state. Methods: We compared the clinical characteristics, laboratory and cardiometabolic disorder makers between SCA patients patients with normal (PP = 35 – 55 mmHg; n = 43) and those with high PP (PP > 55 mmHg, n = 20), all in steady state. Results: Our results showed that SCA with high PP had significantly higher age, waist circumference (WC), systolic and diastolic blood pressure, fasting glucose, TG/HDL, uric acid, PAI-1 and IR markers. Using multivariate regression analysis, results showed that PAI-1 (β = 0.277; p<0.0001) was an independent determinant of high PP in SCA. The area under the receiver operating characteristic (ROC) curve analysis for PAI-1 (0.699) also showed that it was an efficient predictor of high PP. Conclusion: These findings suggest that increased PAI-1 may be a salient risk factor that would promote the development of arterial stiffness and CVD in SCA.

References


**Insulin resistance induced by glucocorticoid treatment is accompanied by increased dipeptidyl-peptidase 4 activity in pregnant rats**

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Background: Exposure to excess glucocorticoid(GC) during pregnancy has been linked to metabolic disorders such as type 2 diabetes, insulin resistance (IR) and increased body weight in later life of offspring (Gomes et al., 2014). Elevated dipeptidyl-peptidase (DPP4) activity has also been implicated in the development of type 2 diabetes and IR (Rohrborn et al., 2015). However, the role of DPP4 in maternal glucose dysregulation has not been documented. We therefore sought to determine whether glucose dysregulation and atherogenic dyslipidemia induced by excess GC exposure during late pregnancy would be accompanied by increased DPP4 activity.

Methods: Pregnant Wistar rats received either vehicle (control) or dexamethasone (DEX; 0.2mg/Kg; p.o.) between gestational days 14 and 19. Glucose tolerance was determined by oral glucose tolerance test (OGTT), whereas IR was determined by homeostasis model of assessment of IR (HOMA-IR). Atherogenic dyslipidemia and cardiometabolic disorder (CMD) were assessed by triglyceride/HDL-cholesterol ratio and triglyceride-glucose index (TyG), respectively. Circulating insulin and DPP4 activity were measured by ELISA and fluorometry method respectively. Results: DEX treatment resulted in impaired glucose tolerance, increased IR, atherogenic dyslipidemia, TyG, insulin and DPP4 activity. Conclusion: These results show that maternal exposure to excess GC results in IR and CMD that are accompanied by increased DPP4 activity.

**REFERENCES**


**Gastric mucosa homeostatic activities of coconut on experimentally induced ulcers in wistar rats**

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The report in literature about the gastroprotective and wound ameliorative effects of coconut has been marred by incompletely comprehended mechanisms. Poised to fill this gap, inflammatory markers, mucosal damage severity, expression of epidermal growth factor (EGFR) and CD31 were investigated using immunohistochemistry technique. In this biphasic study, 64 male wistar rats were divided into 8 groups. In Phase 1, Group 1 was the overall control, group 2 ulcer control, groups 3 and 4 received coconut water (Cw) and milk (Cm) (4ml/100g BWt) for 4 weeks while group 5 received Omeprazole (Ome). (20mg/kg BWt) during terminal week. 95% Ethanol-induced ulceration followed the treatments in all except group 1. Blood collection after 1 hour was through cardiac puncture for haemocytometry, and gastric tissues harvested for histopathological investigations. Results showed significantly reduced ulcer sites/score and gastric lesion index in Ome (2.8±0.10), Cw (3.4±0.2) and Cm (3.3±0.1) groups compared to ulcer control (4.4±0.1). WBC (7.9±0.52; 8.5±0.76; 9.2±2.35), neutrophil (4.3±0.21; 4.7±0.48; 6.0±0.57), lymphocyte counts (2.9±0.32; 3.2±0.23; 3.9±0.61) in Omep, Cw and Cm groups respectively were significantly reduced compared to ulcer control group (15.2±0.74; 7.8±0.49) and overall control (12.3±0.67; 5.7±0.83; 3.5±0.48). C-reactive protein was significantly reduced in Cm compared to control while neutrophil Infiltration and score reduced while mucus cell density increased significantly in Omep (11.8±1.2; 18±1.0; 1.6±0.1); Cw (19.0±0.7; 2.3±0.1; 14.0±1.2); Cm (15.3±0.6; 1.8±0.1; 18±0.12) compared to control (23.0±1.0; 3.1±0.1; 11.8±0.9). In the second phase, Group 6 received Cm + acetic acid, group 7 acetic acid only, and group 8 ome + acetic acid. Cm and omepr were administered post-ulcer induction for 3 and 6 days twice daily. Coconut milk (group 6) significantly decreased ulcer severity on days 4 (3.0±0.1) and 7 (2.5±0.1) compared to ulcer control (4.5±0.2; 2.6±0.8). Additionally, inflammatory cell infiltration score on days 4 (2.5) and 7 (2.0) compared to control (4.0; 3.0). Immunohistochemical analysis revealed significantly higher expressions in coconut-milk group compared to the ulcer control. We conclude that coconut (water and milk) both protects the gastric mucosa via inflammation suppression and stimulation of mucus secretion and improves ulcer-healing via angiogenesis and mucosal cell proliferation thereby catalysing mucosa homeostasis following impairment/erosion.

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**Effect of nicotine on blood glucose level and hepatic glucose uptake in sucrose fed male sprague dawley rats**

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Nicotine, acknowledged as the major pharmacologically active chemical in tobacco is known to alter a number of metabolic pathways such as lipid profile and glucose homeostasis leading to increased risk of cardiovascular diseases. This study was designed to investigate the effect of orally nicotine administration (0.5 mg/kg body weight) on Sprague Dawley SD rats for 4 weeks on blood glucose level and hepatic glycogen content in rats fed with high sucrose diet. 40 male SD rats with body weight 110-150g were randomly divided into 4 groups of control (CG), high sucrose diet (HSD), nicotine only (NO) and high sucrose diet + nicotine (HSDN). At the 2nd and 4th week of study, 12 hours after the treatment, blood glucose level o the rats was determined after which the animals were sacrificed and the liver harvested to determine the glycogen content. Results showed a significant (p<0.05) increase in blood glucose level in HSDN and NO rats when compared to the HSD and CG groups. Furthermore,
results also showed marginal increase in the hepatic glycogen content in HSDN, NO and HSD rats when compared to the CG at week 2 and 4, with the HSDN rats having a significantly higher (p<0.05) percentage change in hepatic glycogen content at week four, when compared with other groups. In conclusion, it appears that sucrose and nicotine increases blood glucose level thereby increasing the risk of developing diabetes and its complications.

References


Petroleum-induced renal dysfunction among petrol vendors in Kano, North-Western-Nigeria.

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Petrol hawkers and pump attendants are exposed to both petrol fumes, vehicular exhausts and other roadside pollutants which have both been reported to cause significant human cardiopulmonary morbidity, hepatotoxicity, myelotoxicity, endocrine and metabolic dysfunctions as well as glomerular and tubular diseases among animals. There is a dearth of information defining the nephrotoxicity of petroleum exposure among humans. This study assessed markers of renal function among petrol hawkers and pump attendants.

The effects of petroleum were compared using an independent sample t-test with significance level set at p<0.05. The result shows a significant increase in serum urea, creatinine and potassium with significantly lower serum levels of sodium, chloride and bicarbonate among hawkers when compared to controls. Equally, they were found to have significantly higher serum levels of urea, creatinine and potassium but lower levels of serum chloride and bicarbonate than a cohort of pump attendants. On the other hand, pump attendants were found to have a significantly higher serum levels of urea, creatinine and potassium and a significantly lower serum levels of sodium and chloride relative to the controls. For both exposure groups, derangement of serum analytes was more pronounced among those with long term exposure. Also, proteinuria was much higher among petrol hawkers (54%) and pump attendants (38%) as compared to the controls (12%). Our findings suggest that exposure to petroleum predisposes to renal dysfunction which is possibly accentuated by road-side pollution.

Reference


Effects of co-administration of cannabis sativa and alcohol on learning and memory

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Cannabis sativa is a commonly abused illicit drug. Some of its effects are impaired short memory, attention and reduced motor skills. Alcohol is a depressor of the central nervous system and under its influence, confusion and disorganized thinking results. Both drugs have a detrimental effect on prospective memory in adults but users may not be aware of this. This study was set out to assess the combined effect of Cannabis sativa and alcohol on learning and memory in mice, using the Y-maze. 24 adult male albino mice were assigned into four (4) groups of six (6) each (n=6). The groups A, B, C, and D were administered distilled water (control), Cannabis sativa, Alcohol, Cannabis sativa and Alcohol, respectively. The dosage for Cannabis sativa was 30% of LD50 (482mg/kg) while Alcohol dosage was 20% ethanol/kg. Memory was assessed using the Y-maze paradigm after 28 days of administration/ Results of the number of possible triads for group B indicated that the mean test scores after administration (M = 9.0, SEM = 2.30) was significantly lower than the mean scores prior to the administration (M = 14.0, SEM = 1.69). For group C, results indicated mean test scores after administration (M = 10.50, SEM = 1.57) was significantly (p<0.05) lower than the mean scores prior to the administration (M = 18.83, SEM = 1.67). For group D, results indicated mean test scores after administration (M = 7.83, SEM = 1.17) was lower than the mean scores prior to the administration (M = 22.17, SEM = 1.05). The findings showed that alcohol impaired learning and memory and more so when co-administered with Cannabis sativa.

Phytochemicals in Malus domestica (Red delicious variety) and its hypocholesterolemic effect

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Phytochemicals in Malus domestica (Red delicious variety) and its hypocholesterolemic effect were studied. Thirty albino wistar rats of either sex weighing between 200 ± 50g were randomly divided into 6 groups of 5 rats each. Hypercholesterolemia was induced by intraperitoneal administration of pure cholesterol (Merck) 1ml/kg in all the animals except in control group. The groups were as follows: Group I received distilled water and served as control, group II received cholesterol only; group III, IV, V and VI received cholesterol with 100,200,400 and 800mg/kg body weight of red delicious apple extract orally for 21 days. Total Cholesterol, Triacylglycerol, HDL and LDL level in serum were analyzed using standard methods. Statistical significance between treated and control groups was analyzed using One-way ANOVA, followed by student’s t Test where P<0.05 was considered significant. The results showed that the red delicious apple extract significantly (P<0.05) decreased total cholesterol when compared with the control, representing about 55.4, 63.0, 64.8 and 63%, in groups III, IV, V and VI respectively. Phytochemical study carried on the red delicious apple variety showed that it contained significant amount of flavonoids, phenols and saponins among other constituents that are known to have hypocholesterolemic effect. The findings of this study concluded that red delicious apple variety extract of Malusdomestica exhibited antihypercholesterolemic activity.

References


A study of Helicobacter pylori infection among subjects with complete, partial and follow up booster immunization in Samara Zaria-Nigeria

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Background: Helicobacter pylori is one of the largest worldwide infectious diseases known to mankind. Helicobacter pylori colonizes the gastric mucosa of almost half of the world's population and is the major culprit associated with gastroduodenal diseases ranging from superficial and chronic gastritis, duodenal and gastric ulcers in about 20% of those infected, to gastric carcinoma and mucosa-associated lymphoid tissue (MALT) lymphoma. Each year, more than half a million people die from gastric cancer. Helicobacter pylori is responsible for 10,900 deaths per year in the US and about 738,000 deaths annually worldwide (Bray et al. 2011). In many developing countries, the infection has a high prevalence rate (80 – 95%). More than 50% of children are infected by the age of 10 years with the prevalence of infection rising to over 80% in young adults (McColl, 2010). H. pylori infection, usually acquired in childhood, leads to the recruitment of immune and inflammatory cells to the stomach. H. pylori infection is linked with the intensity and quality of the innate and adaptive chronic immune responses in the gastric mucosa (Atherton, 2006). Aim and objectives: The study is to investigate the incidence of Helicobacter pylori infection in immunized adults with complete, partial and following up booster immunization in Samara, Zaria-Nigeria.

Methods: Ethical approval for this research was granted by the Protocol and Ethical Review Committee of the Ahmadu Bello University Teaching Hospital, Shika Zaria. Seventy-eight (78) adults comprises of male and female subjects within the age of 18-50 years were randomly selected and tested for H. pylori infection. H. pylori infection was determined using whole blood infection. Usually acquired in childhood, leads to the recruitment of immune and inflammatory cells to the stomach. H. pylori infection is linked with the intensity and quality of the innate and adaptive chronic immune responses in the gastric mucosa (Atherton, 2006).

Result: 51 subjects were vaccinated in their early child for BCG, polio, TB and some with later adulthood booster vaccination for meningitis, hepatitis, tested negative. Chi-square test showed statistical difference with value of 27.128 between vaccinated negative and positive subject (p < 0.05). Conclusion: In conclusion, more than 85% subjects with complete immunization were tested negative for H. pylori infection.

Reference:

Effects of Amlodipine on Blood Pressure and Baroreceptor Reflex Sensitivity in Sprague Dawley Rats fed a High Salt Diet

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The elevated blood pressure response to high dietary salt intake in rats has been shown to be ameliorated by calcium channel blockers (CCBs) (Akinola et al., 2016). The precise mechanism by which amlodipine, a commonly used CCB ameliorates salt-induced hypertension is not clearly understood. This study therefore sought to investigate the effect of amlodipine on blood pressure parameters and baroreflex sensitivity in Sprague-Dawley rats fed a high salt diet. Twenty-eight (28) 6-week-old weaning Sprague-Dawley (SD) rats weighing 110-120g were divided into three experimental groups. Control Rats (CR, n=10) were given normal rat chow and water ad libitum. The Salt loaded rats (SR, n=10) were fed on rat chow containing 5% sodium chloride as described earlier (Sofola et al., 2002); while the third group were Salt-loaded rats that were concomitantly administered with amlodipine (SR+Am, n=8). Amlodipine was given by oral gavage at a dose of 0.3mg/kg body weight. These procedures were carried out for 6 weeks. The blood pressure measurements were obtained by cannulation of one femoral artery via a pressure transducer attached to a computerized data acquisition system with LabChart-7 pro software (Power Lab-4/24T, model MLT844/P, AD Instruments) following anaesthesia with urethane and α-chloralose at a dose of 5mls/kg bw. The heart rate was determined by counting the number of arterial pulses over a period of 60 seconds. Both common carotid arteries were isolated in the neck and sutures put around them for subsequent bilateral carotid occlusion. At the end of the experimental procedures, blood was collected through cardiac puncture for determination of plasma concentrations of sodium and potassium ions. Baroreflex sensitivity was calculated as change in heart rate per unit change in mean arterial blood pressure. Systolic, diastolic, mean and pulse pressures and plasma Na+ concentration were significantly (p<0.001) higher in the SR group compared to the CR group. These parameters were however significantly (p<0.01) lower in the SR+Am group when compared with the SR group. Heart rate responses were not significantly (p>0.05) different between CR and SR. However, the rate was reduced but not significantly in the SR+Am group compared to the SR group. Baroreflex sensitivity and plasma K+ concentration were significantly (p<0.05) lower in the SR compared to the CR. They were however significantly higher (p<0.01) in the SR+Am group when compared with the SR group. Baroreflex sensitivity and potassium concentrations in CR and SR-Am were not significantly different. This study shows that administration of amlodipine during salt loading in SD rats blunts the pressor response of salt load through mechanisms that include correction of changes in serum Na+ and K+ concentrations, as well as correction of impaired baroreceptor reflex sensitivity.

Combination of Renal Denervation and Arginine Supplementation Improves Physical Parameters and Myocardial Oxygen Demand in Salt-Induced Hypertension in Sprague-Dawley Rats

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Hypertension remains the most prevalent cardiovascular risk factor worldwide. Treatment of hypertension has largely evolved from single drug therapy to combination of drugs exhibiting different mechanisms of action. This study sought to investigate the effect of combined use of renal denervation and arginine supplementation on physical parameters and myocardial oxygen demand in salt-induced hypertension in Sprague-Dawley rats. Fifty-six (56) weaning Sprague-Dawley (SD) rats weighing 50-60 g were used. They were divided into 7 groups of 8 animals each as follows: Group I was fed with normal rat chow containing 0.3% NaCl. Groups II and III were fed normal and high salt diet respectively then sham-denervated without any treatment. Groups IV and V were fed normal and high salt diet respectively then...
renalin-denervated while Groups VI and VII were fed normal and high salt diet respectively then administered with arginine (100mg/kg/day). Blood pressure parameters were determined via left carotid artery cannulation following anaesthesia with urethane and α-chloralose at a dose of 5mls/kg/bw. Rate pressure product (RPP) was calculated and used as an index of myocardial oxygen demand. Heart and kidney weights were also measured. Salt-loading caused significant (p<0.05) loss of weight in the rats. It also significantly (p<0.05) increased heart and kidney weight indices as well as the RPP. Renal denervation caused an increase in mean body weight and a significant (p>0.05) decrease in percent mean kidney index of the salt-loaded rats. The change in percent mean heart index and the demand for oxygen by the myocardial cells were also not significantly. Combined use of renal denervation and arginine supplementation however caused a significant (p<0.01) reduction in salt-induced increase in percent mean heart index, kidney index and the RPP without significantly changing the salt-induced weight loss. This study shows that combined use of renal denervation and arginine supplementation ameliorates impaired physical parameters and myocardial oxygen demand in salt-induced Sprague-Dawley rats.

Sleep-Deprivation and Coffee Consumption-Induced Changes in BMI, Blood Pressure and Blood Glucose in Male Wistar Albino Rats

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Intentional sleep-restriction is progressively high and common among those experiencing environmental/psychological stress due to work demands, abnormal working hours and psychiatric/physical disorders in developing and industrialized societies. Deficiency of sleep has several concerns, which include increased prevalence of disease risks and mortality. 30 adult rats randomly divided into six groups with sleep deprivation (SD) (using multiple platform method) and coffee administration for 30 days: A (control), B (SD only), C (416.75ml/kg coffee), D (833.50ml/kg coffee), E (SD + 416.75ml/kg coffee) and F (SD + 833.50ml/kg coffee). Blood pressure was determined by cannulation of carotid artery using pressure transducer and a polygraph. Glucose concentration was determined after enzymatic oxidation and BMI calculated using rat weights’ and lengths’. Mean arterial pressure (MAP) was significantly increased in groups B, D, E and F compared to control. Blood glucose demonstrated a significant reduction in groups B, C, D, E and F compared to control. SD rats had a significant decrease in BMI compared to control while groups C, D, E and F were significantly increased compared to B. Reduction in glucose across the treatment groups could indicate an improved glucose tolerance. Also, increased energy expenditure, may explain the reduction in BMI in high and low doses of coffee + SD groups and increase in MAP. SD + coffee induced stress may aide in the prevention of obesity, type 2 diabetics although the significant increase in MAP.

References

Obesity and salivary secretion in Wistar rats

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Obesity is currently a challenging health issue worldwide as increased prevalence of periodontal diseases has been reported in obese individuals. Salivary secretion plays a vital role in the normal functioning of the oral cavity as well as the body systems. Thus, this study aimed at investigating the changes induced by obesity in salivary secretion from Wistar rats. Five weeks old rats were randomly divided into 2 groups (obese and control groups) of seven rats each. The rats were fed with different dietary formulae to induce normal weight and obesity for 15 weeks. Following anesthesia with ketamine (75 mg/kg bw i.p.) and Xylazine (0.5 mg/kg bw i.m.), stimulated (using pilocarpine, 5 mg/kg bw i.p.) whole saliva samples were collected. Samples were evaluated for lag time, flow rate, total protein, pH and electrolytes levels. Parotid and submandibular glands were also removed surgically for histological analysis. In the obese group, body weight, serum total cholesterol, and serum triglycerides levels were significantly higher than those in age-matched control (p < 0.001, all comparisons). Salivary levels of calcium and phosphate were elevated compared with the normal weight group (p < 0.001 and p = 0.02 respectively). There were no significant differences in the salivary lag time, flow rate, total protein, pH, as well as electrolytes comparing obese group with the normal weight group. These findings indicate that obesity is associated with elevated levels of salivary calcium and phosphate. This suggests their roles in the pathophysiology of oral diseases associated with obesity.

References

The organophosphate pirimiphos methyl alters estrous cyclicity and hormonal concentrations in female rats

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Background: Pirimiphos methyl is an organophosphate (OP) which has widespread agricultural and domestic use against pests of stored grain and various insects. Apart from their intended effects, pesticides have been linked with some adverse effects on the environment and non-target organism. The aim of this study was to evaluate the effect of exposure of pirimiphos methyl on estrous cyclicity and hormonal changes in female rats. Methods: 96 female rats were divided into four groups: group 1 received distilled water (control) orally while those in groups 2-4 were exposed to pirimiphos methyl orally at a dose of 10mg/kg, 60mg/kg and 120mg/kg body weight respectively. The pattern of estrous cycle was monitored during the administration and blood samples were collected at the various phases of estrous cycle and were assayed using enzyme-linked-immunosorbent serologic assay (ELISA) techniques. RESULTS: Rats treated with pirimiphos-methyl exhibited an extended estrous cycle with a significant decrease (P<0.05) in the proestrus and estrus phases of the cycle. There was a disruption in the level of secretion of LH, FSH, Estradiol and Progesterone during the different phases of the estrous cycle in female rats treated with pirimiphos methyl. CONCLUSION: These results indicate that pirimiphos methyl caused an imbalance in these hormones which led to irregularity in ovarian function and changes in the duration of estrous cycle as observed in this study.

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Glycemic allostatic and cognitive performance

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Introduction: Contrary to the long-held view on the constancy of the internal environment (homeostasis), biological parameters actually equilibrate between ranges of constant values. The phenomenon is called allostatic. The concept was first proposed in 1988 by the Englishmen Sterling and Eyer to describe an additional process of reestablishing homeostasis. The term “allostasis” is gradually gaining attention in the scientific community. Glycemic allostatic is the process by which blood glucose stabilization is achieved through the balancing of glucose consumption rate and release into the blood stream under a variety of stressors. It involves glucose acting as a peripheral signal for the secretion of the respective hormones and mediators by pancreatic endocrine cells or other involved cell types. Different types of stressors to varying degrees constantly act on blood glucose or its regulatory systems at the peripheral and/or central levels. In normal condition, the actions of the stressors are consistently counterbalanced by the organism’s organs and systems by maintaining an allostatic set point. The aim of this study was to conduct a review of data on the relationship between glycemic allostatic regulation and cognitive performance.

Methods: The study is a retrospective analysis of the authors’ published data on mechanisms of glycemic maintenance and cognitive performance in different mental states in young adults aged 18–30 years, obtained during the last decade. Results and Discussion: The data indicate that glycemic allostatic is related to the cognitive load. In the absence of potential exogenous stressors such as alcohol; sleep disturbances, etc., cognitive load was associated with glycemic levels and showed a stronger relationship with increasing load. The Spearman and Pearson linear correlation and regression analyses revealed a significant positive relationship between cognitive loads and glycemic levels. Analysis of the coefficient of determination (η² and r²) showed that the proportion by contribution of glycemia to cognitive errors was approximately 26.0–39.3% (P<0.01) in different instances of cognitive loads. The contribution of glycemia to cognitive performance varies between 12.0 and 59.3% (P<0.01), depending on the type and phase of execution of the cognitive loads. The calculated contribution of glycemia in the supply of energy for cognitive functions is in agreement with literature data. Importantly, the error commission recovery rate confirms our previously formulated hypothesis about the role of glycemic allostatic on the error monitoring and processing system.

Conclusion: The relationship between glycemic allostatic regulation and cognitive performance is of a curvilinear character. Adequate glycemic allostatic regulation is integral in the maintenance of cognitive performance and the error monitoring and processing system; reaffirms our previous hypothesis. Future direction: There is need to investigate the effects of various cognitive loads and stressors on the peripheral and central integrators of glycemic allostatic in normal and pathology. This will provide further information on some of the mechanisms of peripheral and central control of glucose sensing under the action of different cognitive loads or stressors.

Ulcera healing activities of Chrysophyllum albidum bark extract

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Methanolic bark extract of Chrysophyllum albidum (MeCaB) has been well documented for varied physiological homeostatic properties. There is dearth of information on its activity during ulcer healing which this study sought to investigate. 120 male wistar rats (120-150g) were divided into 8 groups (n=15) viz: Groups I -delayed ulcerated untreated; II and III – 500 and 250mg/kg b.w MeCaB respectively; IV, III and IV -100mg/kg b.w chromatographic fractions A, B and C (CFrA,B and C) respectively; VII - 30mg/Kg.b.w Omeprazole and VIII -ulcerated untreated. Delayed gastric ulcer was induced using acetic acid with oral drug treatments occurring simultaneously for 14 days. Body weights were monitored daily, stomach ulcer score, biochemical and histological analysis were assessed on days 3, 7 and 14 post-treatment after quick decapitation. Data were expressed as Mean ± SEM, analyzed using one-way ANOVA and p<0.05 was considered significant. In this study, MeCaB (250 and 500mg/Kg b.w) showed complete ulcer healing by day 3 with CFrA, B and C by day 7. The MeCaB; CFrA, B and C significantly reduce Neutrophil/lymphocyte ratio, lipid peroxidation and H+K+ pump activities. The extract and its chromatographic fractions significantly increased Superoxide dismutase, Catalase, Glutathione, Nitric oxide levels and Mucin content by days 3 and 7 resolving by day 14 compared with untreated groups. These observed results were further buttressed by histological evaluations. Methanolic bark extract of C. albidum and its chromatographic fractions exhibited accelerated ulcer healing potentials probably by enhancing antioxidant levels, mucin content and decreasing H+K+ pump activity of gastric tissue.

Serum Aldosterone not Angiotensin II Correlates Positively with Blood Pressure in Obese Sudanese Patients with Essential Hypertension

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Objective: To investigate the effect of oral glucose with NaCl on the renin angiotensin aldosterone system and blood pressure (BP) in adult patients with essential hypertension. Design and Method: 20 newly diagnosed untreated essential hypertensive patients and 15 normotensive control subjects matched for age gender and BMI were studied. Patients fasted overnight (8- 10 hrs) then each subject took: 75gm glucose, 75gm glucose plus 3 gm NaCl in 250 ml; each solution on a different day. Results: Subjects were classified into obese (BMI≥ 30Kg/m2) (11 patients, 8 normotensives) and nonobese BMI<30 Kg/m2) (9 patients, 7 normotensives). In obese hypertensive patients after intake of glucose and glucose with NaCl, aldosterone showed significant positive correlation with systolic BP (P=0.009), (P=0.05), diastolic BP (P=0.02) and mean BP (P=0.01), (P=0.01) respectively. Aldosterone was significantly higher in hypertensive patients (obese and nonobese) compared with their normotensive controls. In nonobese normotensive subjects after intake of glucose, aldosterone showed highly significant positive correlation with systolic BP, diastolic BP and mean BP (P<0.005). In hypertensive patients, the correlation between serum AngII and BP was not significant. However, AngII was significantly higher in obese hypertensive than nonobese patients after glucose (P=0.04) and glucose with NaCl.
(P=.05). Conclusion: The association of aldosterone with BP in normotensive and hypertensive subjects in suggests a promising effect of aldosterone blockers on management of hypertension especially obese African patients.

References:

Combination of Renal Denervation and Arginine Supplementation Improve Physical Parameters and Myocardial Oxygen Demand in Salt-Induced Hypertension in Sprague-Dawley Rats
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Hypertension remains the most prevalent cardiovascular risk factor worldwide. Treatment of hypertension has largely evolved from single drug therapy to combination of drugs exhibiting different mechanisms of action. This study sought to investigate the effect of combined use of renal denervation and arginine supplementation on physical parameters and myocardial oxygen demand in salt-induced hypertension in Sprague-Dawley rats. Fifty-six (56) weanling Sprague-Dawley (SD) rats weighing 50-60 g were used. They were divided into 7 groups of 8 animals each as follows: Group I was fed with normal rat chow containing 0.3% NaCl. Groups II and III were fed normal and high salt diet respectively then sham-denervated without any treatment. Groups IV and V were fed normal and high salt diet respectively then renal-denervated while Groups VI and VII were fed normal and high salt diet respectively then administered with arginine (100mg/kg/day). For the bilateral denervation, the left kidney was exposed via a flank incision following anaesthesia with a solution of 25% (w/v) urethane and 1% (w/v) chloralose injected intraperitoneally at a dose of 5 mls/kg body weight. Rate pressure product (RPP) was calculated and used as an index of myocardial oxygen demand. Heart and kidney weights were also measured. Salt-loading caused significant (p<0.05) loss of weight in the rats. It also significantly (p<0.05) increased heart and kidney weights as indices of the RPP. Renal denervation caused an increase in mean body weight and a significant (p<0.05) decrease in percent mean kidney index of the salt-loaded rats. The change in percent mean heart index and the demand for oxygen by the myocardial cells were also not significant. Combined use of renal denervation and arginine supplementation however caused a significant (p<0.01) reduction in salt-induced increase in percent mean heart index, kidney index and the RPP without significantly changing the salt-induced weight loss. This study shows that combined use of renal denervation and arginine supplementation ameliorates impaired physical parameters and myocardial oxygen demand in salt-induced Sprague-Dawley rats.

Exposure to trivalent chromium inhibited glucose transport across mouse intestinal membrane in vitro.
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Trivalent chromium (Cr3+) supplementation has long been associated to management of type-2 diabetes in human. Meanwhile, the gastrointestinal tract and especially the small intestine play significant role in the regulation of glucose of both normal and diabetics. This study was investigated to determine the effect of Cr3+ exposure in the absorption of glucose in the normal gut.
Male slc:ddY mice (26.2±1.1 g) were grouped into three: Control (tap water), 10ppm (Cr3+) and 100ppm (Cr3+) and exposed for 12 weeks through their drinking water. After period of exposure, mice (n=5) were sacrificed with intranasal isoflurane. Thereafter, the intestines were excised gently and quickly, rinsed with cold Ringers solution and divided into the required segments. The everted sac method was determined by spectrophotometry following an hour of incubation of the tissue in a 5mL glucose free Ringers after the initial addition of 200µL Ringers solution to the sac. Transmural potential difference (PD) following the application of glucose to the mucosal end of an opened sac following standard procedures. The results showed a decrease glucose concentration at the lower jejunum part of the serosa in the test groups compared with control in the everted sac experiment. However, the mucosa glucose concentration was elevated at the same region when compared with the control mice. In the PD across the membrane, there was significant reduction in the PD in the distal jejunum and ileum of Cr3+ exposed groups compared with the control signifying a reduced uptake of the solute (glucose) across the membrane. We concluded that Cr3+ probably reduces intestinal glucose transport by down-regulating SGLT-1 transporters. However, this mechanism was not elucidated in this study.

BMI and lipid profile improvement after regular ingestion of Gum Arabic (Acacia Senegal); an intervention case control study
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Introduction: Gum Arabic is a safely consumable water soluble fiber which is used in food and drug industry. The beneficial effects of gum Arabic in renal disease, colon cancer and body weight management has been documented in many reports. Increasing the intake of water soluble fibers has long been recognized as dietary intervention in patient with obesity, DM, Hypertension and other conditions to decrease the complications of hyperlipidemia. The study was conducted to evaluate the effectiveness of regular intake of an appreciable dose of Gum Arabic (Acacia Senegal) on body mass index (BMI) and the lipid profile in healthy individuals. Methods: This study was an Intervention case control study. The study population was a total of 53 young and healthy females (age 17-21 years old) recruited by volunteering from the students of the Faculty of the medicine. University of Khartoum the volunteers were blindly and randomly allocated into two groups. An intervention group (n=32) and control group (n=21). Both groups were followed up for a period of 8 weeks. At both the start and end of the follow up period data was collected from volunteers, being: Measurements of starting and ending body weight; height; skin fold thickness and fasting blood samples for lipid profile analysis. Both groups had to follow their normal life style regarding for habits and daily activity. The intervention group had to consume 30 grams of gum
Arabic (15g dissolved in 400 ml of water twice per day) on daily bases all through the follow up period. The study was ethically approved and all volunteers consented to participate. Results: There was an observed reduction in the mean body weight and BMI in the study group and not in the control group but the difference before and after was not significant. On the other hand the intervention group showed a significant improvement of their lipid profile in the form of a significant reduction in serum cholesterol level (160.7 ± 25 to 106.7±14, p < 0.001), triglyceride level (28.2 ± 21 to 52.3 ± 10, p = 0.02) and LDL level (118.9 ± 24 to 72 ± 15, p < 0.001) and a significant increase in HDL Level (24.2 ± 5 to 30±7, p < 0.001). Conclusion: Regular ingestion of Gum Arabic improved the lipid profile of the study group by decreasing cholesterol and LDL levels and increasing the HDL level with minimal infrequent side effects in the form of GIT disturbance in the first few weeks. The possibility of using Gum Arabic as an effective dietary intervention to prevent complications of hyperlipidemia in risk groups such as Obese, DM and hypertensive patient is likely and should be investigated.

Sodium valproate, a glycogen synthase kinase-3 inhibitor, improves insulin resistance and reduces plasminogen activator inhibitor-1 during oral contraceptive treatment independent of circulating aldosterone

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Objective: Glycogen synthase kinase-3 (GSK-3) is a negative modulator of insulin action and an enhancer of plasminogen activator inhibitor-1 (PAI-1) synthesis (Eldar-Finkelman and Krebs, 1997). Aldosterone has also been shown to impair insulin action and increase PAI-1 (sheraje et al., 2013). We therefore, hypothesize that sodium valproate (SV), a GSK-3 inhibitor, would improve oral contraceptive (OC)-induced insulin resistance (IR) and elevated PAI-1 through aldosterone dependent pathway. Methodology: Female Wistar rats (aged 8-10 weeks) were randomly allotted into four groups namely; control, SV (100 mg/kg), OC (1 µg ethinylestradio + 5 µg levonorgestrel) and OC + SV. Animals were treated (p.o.) daily for six weeks. Glucose tolerance was estimated by area under the curve (AUC) of oral glucose tolerance test (OGTT) whereas IR was estimated using homeostatic model assessment of IR (HOMA-IR). Triglyceride (TG) /HDL-cholesterol and total cholesterol (TC)/ HDL-cholesterol were estimated as atherogenic dyslipidemia. Fasting plasma insulin, PAI-1 and aldosterone levels were estimated by ELISA kits. Results: OC treatment led to impaired glucose tolerance, increased HOMA-IR, atherogenic dyslipidemia, plasma insulin, PAI-1 and aldosterone levels. However these alterations were normalized and /or improved by SV treatment except aldosterone. Conclusion: Our results suggest that SV improves OC- induced impaired glucose tolerance, IR, dyslipidemia and elevated plasma PAI-1 levels independent of circulating aldosterone.

References
Microscopic Blood film Appearance and Some Haematological Indices of Normal Albino Rats after Garlic Administration.


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Despite high acceptability of Allium sativa (Garlic) as a remedy for many diseases as earlier stated by many researchers. Some research works have demonstrated that chronic and unregulated consumption of garlic may result to intra vascular haemolytic anaemia in rats. This prompted the present study to examine the effect of crude extract of garlic on microscopic status of red blood cells and some haematological indices of normal albino rats. The animals were grouped into two, group 1 as control and group 2 as experimental. Group 1 were fed with normal feeds and water and group 2 were fed with normal feeds and 150mg/kg body weight of crude extract of garlic on alternate days for three weeks. The results showed that the PCV was 43.20 ± 0.80 and 45.00 ± 0.36 in both control and experimental groups respectively. However, the RBCs were significantly decreased (P≤ 0.05) from 166.80 ± 3.44 to 87.80 ± 9.34, while the reticulocyte counts significantly increased from 34.00 ± 4.25 in control group to 145.8 ± 16.4 cells in treated group. Fragmented RBCs with a lot of schistocytes with adequate platelets were seen on blood film of crude garlic treated rats as compared to control. Our results suggested intravascular haemolysis and numerous reticulocytes on blood film confirmed our view and that bone marrow responded well. Presence of schistocytes also prove liver involvement.