Is resveratrol intake associated with functional and structural amelioration following uninephrectomy?

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Background: Uninephrectomy (Unix) is generally followed by structural and functional changes in the remaining kidney, as well as systemic metabolic changes. We investigated the effect of resveratrol, a naturally occurring polyphenol with strong antioxidant and nephro-protective properties, on these changes at 3, 5 and 7 months post uninephrectomy.

Materials & Methods: Uninephrectomy was performed in adult Wistar 54 rats aged 12 weeks; 26 of those received resveratrol 20 mg/kg/day by oral gavage starting 7 days post-uninephrectomy, and until termination of the experiment. A further 17 rats were sham operated and acted as controls. The experiment was terminated at 3, 5 or 7 months post-uninephrectomy, to study the progress of structural and functional renal changes over time.

Results: Uninephrectomy was associated with compensatory renal growth, with hypertrophy of the remaining kidney that were evident at 3, 5 and 7 months post-surgery. Fibrosis of the remaining kidney appeared at 7 months, with an increase of serum urea (−39%, P = 0.001) and creatinine (−32.7%, P < 0.0001) relative to controls. Resveratrol significantly decreased hypertrophy of the remaining kidney (−17%, P = 0.0001) and limited compensatory growth (−14%, P = 0.0001), and ameliorated the renal fibrotic changes. At 7 months post uninephrectomy, resveratrol had also lowered fasting serum urea (−17.4%, P = 0.01), creatinine (−15.4%, P = 0.0002), triglycerides (−15%, P = 0.005), total cholesterol (−22%, P = 0.004), non HDL cholesterol (−50%, P = 0.002) and atherogenic index (−36%, P = 0.004) relative to the untreated uninephrectomy group. Moreover, resveratrol intake for 7 months post-uninephrectomy decreased 24-hour urine total protein (−42%, P = 0.01) and the urine protein/creatinine ratio (−35%, P = 0.06).

Conclusion: Early administration of resveratrol following uninephrectomy ameliorates long-term renal structural and functional changes and metabolic perturbations. Our data suggests that resveratrol may be potentially beneficial as an adjuvant therapy in human kidney donors.

Role of irisin administration in modulating testicular function in adult obese albino rats

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Background: Irisin, exercise-induced myokine, is known to improve obesity-induced metabolic disturbances by enhancing thermogenesis and increasing energy expenditure. Recent studies have reported that irisin promoted cell proliferation and protected cells from apoptosis. However, the effects of irisin on testicular function in obese rats is still to be investigated.

Objective: This study was designed to explore the probable effects of irisin treatment on modulating the adverse effects of obesity on testicular functions with a trial to clarify some of the possible underlying mechanisms.

Design: Thirty adult male wistar albino rats (200 ± 30g) were divided equally into 3 groups, group (I): Saline-vehicle treated normal fed group, group (II): Saline-vehicle treated rats were fed a high fat diet (HFD) for 10 weeks. group (III): irisin treated HFD-fed rats for 10 weeks and irisin was injected subcutaneously (150 µl daily for 4 weeks). Rats were weighed and serum levels of glucose, insulin, lipid profile, FSH, LH, estradiol & testosterone levels, epididymal sperm count and motility, testicular malondialdehyde (MDA) level, superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPX) activities, testicular and epidydymal fat weights were estimated. Testicular histopathological study was done as well.

Results: There was a significant increase in the body mass index (BMI) together with deterioration of metabolic, gonadal functions and testicular oxidant/antioxidant system in group (II), while exogenous irisin administration in group (III) resulted in: Significant decrease in BMI, insulin resistance with improvement in lipid profile, significant increase in serum FSH, LH & testosterone, sperm count and motility in male rats. Together with marked improvement in the testicular histoarchitecture. Additionally, there was a significant increase in testicular SOD, CAT & GPX activities. However, it significantly decreased testicular MDA level.

Conclusions: It could be suggested that irisin has a potential positive role against obesity-induced testicular dysfunction, which may be due to its role in maintenance of glucose & insulin homeostasis, its antioxidant properties and/or maintenance of gonadal hormonal function via indirect and/or direct effects on the gonads.

The effect of synbiotics on serum indoxyl sulfate in maintenance haemodialysis patients


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Background and Objectives: Indoxyl sulfate (IS) is a major uraemic toxin contributing to major cardiovascular morbidity and mortality. The aim of our study was to evaluate whether synbiotic (pre- and probiotic) therapy alters the gut microbiota and reduces serum concentrations of IS in hemodialysis patients.

DESIGN, SETTING, PARTICIPANTS, & MEASUREMENTS: 80 ESRD patients undergoing regular hemodialysis recruited (between January, 2017 and March, 2017) to a single-blind, placebo-controlled trial of synbiotic therapy over 6 weeks. The primary outcome was serum Indoxyl Sulfate (IS). Secondary outcomes included serum Creatinine, Blood Urea Nitrogen (BUN), Sodium, Potassium, Calcium, Phosphorus and C-reactive protein (CRP).

Results: All 80 individuals randomized (70% males) completed the study. Synbiotic therapy significantly reduced serum IS (change in serum IS is 13.55 ± 9.31 in the group receiving Synbiotics, in comparison to 3.18 ± 14.56 in the control group, p-values: <0.001, 0.176 respectively). Also Synbiotic therapy significantly reduced the levels of Creatinine, BUN, Phosphorus (p-values <0.001) and CRP (p-values: 0.011).
Conclusion: In Haemodialysis patients, synbiotics significantly reduced serum IS, besides a marked reduction in serum Phosphorus and CRP without recorded adverse effects.

**Haemostatic alterations induced by hyperthyroidism in wistar rats**

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**Background/Aims:** Various abnormalities of coagulation occur in patients with thyroid diseases, and may range from subclinical laboratory abnormalities to clinically significant disturbances of coagulation and, rarely, major hemorrhage or thromboembolism. The purpose of the study was to investigate the changes in the hemostatic system in an experimental rat model of hyperthyroidism with special emphasis on the possible role of oxidative stress in this aspect.

**Methods:** The study included 24 adult male Wistar rats allocated into 2 groups: control and hyperthyroidism (hyperthyroidism was induced by intraperitoneal injection of L-thyroxine (0.3 mg/kg) daily for 2 weeks). All rats were subjected to determination of body weight (BW), body mass index (BMI), serum levels of free triiodothyronine (FT3), free thyroxine (FT4) and thyroid stimulating hormone, complete blood picture, prothrombin time (PT), activated partial thromboplastin time (APTT), plasma levels of fibrin degradation products (FDPs), malondialdehyde (MDA) and catalase activity and C-reactive protein (CRP).

**Results:** Hyperthyroid group showed significant decrease in BW, BMI and their percentage change, associated with prolongation in PT and APTT, rise in plasma FDPs level, reduction in platelet count and plateletcrit, increase in white blood cell count and plasma MDA level together with decrease in catalase activity. CRP was increased, though the increase was statistically insignificant.

**Conclusion:** Hyperthyroidism potentiates a disturbed hemostatic balance in favor of bleeding tendency, manifested mainly by hypocoagulation, hyperfibrinolysis and thrombocytopenia. This could at least in part, be a direct effect of thyroid hormones excess as well as an effect of the accompanying oxidative stress and inflammatory state.

**Effect of visceral obesity on osteoporosis in overiectomized rats**

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The relationship between obesity and bone tissue has been widely studied. However, there are contradictory data about whether adipose tissue mass and bone mass are positively or negatively correlated.

Osteoporosis represents the most common metabolic bone disease. Postmenopausal women are particularly susceptible to osteoporosis when their production of estrogen declines. The Objective of this study was to investigate the possible effect(s) of increased visceral adiposity on ovariectomy-induced osteoporosis in rats.

**Methods:** We studied adult female Wistar rats divided into three groups: a) Sham-operated control (SHAM) rats (n = 12), rats were fed a control diet (51% of food intake from carbohydrates, 4-5% from fat, 12-13% from protein, 13% from minerals and ash) for 12 weeks, b) Ovariectomized (OVX) rats (n = 14), rats were fed a control diet as SHAM rats, c) High fat diet- fed ovariectomized (OVX-HFD) rats (n = 13), rats were fed a high fat diet (41-42% of food intake from carbohydrates, 16-17% from fat, 12-13% from protein) for 12 weeks.

At the end of the experiment, blood samples were collected. Serum levels of calcium, phosphorus, alkaline phosphatase (ALP), and osteocalcin were assayed. Unilateral left perirenal fats as a representative of visceral fat were surgically removed and weighed. Right perirenal fats and tibia specimens were isolated and processed for histological examination.

**Results:** Compared to SHAM, OVX-rats showed a significant increase in waist circumference (WC), visceral fat weight, and its percentage to body weight. The OVX-rats showed a significant decrease in serum calcium & phosphorus levels, and a significant increase in serum ALP. Serum osteocalcin was significantly increased in OVX-HFD group as compared to control group, while in the OVX group, it was increased but did not reach level of significance. Light microscopic examination of the tibia of the OVX rats revealed a significant decrease in the cortical bone thickness (CBBT) and the trabecular bone thickness (TBBT). In addition, there was a significant increase in the osteoclast number. These changes were further accentuated in OVX-HFD group.

**Conclusions:** Results suggest a detrimental effect of visceral adipose tissue on bone health in OVX- rats.