Oxidative stress

Cod: 1243

THE INVESTIGATION EFFECT OF NIGELLA SATIVE OIL, THYMOQUINE, PROPOLIS AND CAFFEIC ACID PHENETHYL ESTER ON OXIDANT/ANTIOXIDANT SYSTEM IN LENS TISSUE IN RADIATION-INDUCED CATARACT IN RAT

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BACKGROUND: Cataract blindness is the major cause of preventable blindness worldwide especially in the developing countries. Eye morbidity is widely observed in patients receiving total-body irradiation prior to bone marrow transplantation or radiotherapy. The aim of this study was to investigate the antioxidant and radioprotective effects of Propolis and Caffeic acid phenethyl ester (CAPE), Nigella sativa oil (NSO) and Thymoquinone (TQ) against ionizing radiation-induced cataracts in lens after total cranium irradiation of rats with a single dose of 5 Gy.

METHODS: 74 Sprague-Dawley rats were used for the experiment. The rats were randomly divided into 8 groups. Group A (Irradiation (IR) plus NSO), Group B (IR plus Propolis), Group C (IR plus TQ), Group D (IR plus CAPE), Group E (IR) received 5 gray (Gy) of gamma irradiation as a single dose to total cranium plus 1-ml saline through an orogastric tube, Group F1 (the control group of A) just without 1-ml saline through an orogastric tube did not receive NSO, TQ, CAPE and Propolis, Group F2 received dimethyl sulfoxide intraperitoneally injections at an equal volume of that Propolis, TQ, and CAPE was dissolved for group B, C and D respectively, Group F3 (normal control group) only fed with standard laboratory chow and water. Supplementation period was 10 days. Propolis, CAPE and TQ were dissolved in dimethyl sulfoxide just before giving to the rats.

RESULTS: SOD activity in group E was lower but GSH-Px, XO activity and MDA levels was higher than all other groups. Total superoxide scavenger activity and non-enzymatic superoxide scavenger activity were not statistically significant in group E compared with the other groups.

CONCLUSIONS: These results suggest an important role of oxidative stress in the irradiation-induced cataractogenesis with naturally occurring compounds (NSO, TQ, CAPE and Propolis) playing the role of an antioxidant and free radical scavenger. However Propolis and NSO were found to be more potent than the others. These are likely to be a valuable drug for protection against gamma-irradiation and/or be used as an antioxidant against cataractogenesis.
Keywords: Oxidative stress, antioxidant, lipid peroxidation, irradiation

Oxidative stress

Cod: 1244

EFFECT OF WATER EXTRACT OF TURKISH PROPOLIS ON INTRACELLULAR CALCIUM AND HYDROGEN PEROXIDE LEVELS IN HUMAN LARYNGEAL EPIDERMOID CARCINOMA CELL LINES (HEP-2)

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BACKGROUND: Propolis is produced by bees from various plants and trees and is a resinious, a natural product used for health, food and a variety of purpose. One of the most biological effects of propolis is known as its anticancer property. In various cancer types investigated for this biological effect, it has been shown that propolis treatment may be cytotoxically to cancer cells. It has been suggested that this effect occurs to lead by apopitosis for cells. A major aim of the present study is to investigate intracellular H_2O_2 and free Ca^{2+} levels to explain the cytotoxic mechanism of propolis in a cancer cell-line (Hep-2).

METHODS: For this purpose, effects of water extract of Turkish propolis (WEP) and ethanolic extract of Turkish propolis (EEP) at concentrations of 0.05-3 mg/mL on intracellular H_2O_2 level and free Ca^{2+} index (a fluorescence ratio of 360/380 nm) were investigated by spectrofluorometric methods, 2′, 7′-dichlorofluorescein diacetate (DCFH-DA) and Fura-2 acetoxymethyl ester (Fura-2AM), respectively.

RESULTS: Both WEP and EEP increased intracellular H_2O_2 levels and Ca^{2+} index according to control (0 concentration) at first 5 minutes of fluorimetric readings.

CONCLUSIONS: It was concluded that WEP and EEP have cytotoxical effect on Hep-2 cells by increasing intracellular H_2O_2 and Ca^{2+} levels.

Oxidative stress

Cod: 1245

SERUM CERULOPLASMIN LEVELS OF COMMON MIGRAINE PATIENTS COMPARED TO HEALTHY CONTROLS

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BACKGROUND: In this study we aimed to evaluate the serum ceruloplasmin levels of Common Migraine Patients compared to healthy controls.

METHODS: This study was conducted as a prospective case-control study. Fourty Common Migraine Patients according to the diagnostic criteria of the International Headache Society and fifty two healthy volunteers as controls were included to the study. The participants were informed of the content and conduct of the study and informed consent forms were obtained. Serum samples were collected and were centrifuged. Serum ceruloplasmin levels were studied in same Clinical Biochemistry Laboratory at the same time.

RESULTS: Serum ceruloplasmin levels were statistically increased in Common Migraine Patients group compared to control group (p<0,005).

CONCLUSIONS: In migraine pathogenesis, Trigemino-vascular system and Trigeminal ganglion is stimulated and vasoactive neuropeptides from nerve endings (CGRP, SP, NKA) are released. So that meningeal artery expands, plasma extravasation with mast cell degranulation occurs and leads to the release of proinflammatory agents. An acute phase reactant of ceruloplasmin releases, and the level of this parameter increases in certain diseases such as migraine and usually indicates the severity of inflammation. As a result, Migraine is an inflammatory disease and serum ceruloplasmin level increases in patients with Common Migraine.
Key Words: Ceruloplasmin; Common Migraine; Acute-Phase Reactants

Oxidative stress

Cod: 1246

THE LEVELS OF MALONDIALDEHYDE, NITRIC OXIDE, THE ACTIVITY OF XANTHINE OXIDASE AND SUPEROXIDE DISMUTASE ENZYMES OF PATIENTS WITH RHEUMATOID ARTHRITIS AND SYSTEMIC SCLEROSIS

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BACKGROUND: Oxidative damage to essential cell components caused by oxygen free radicals has been proposed as an important mechanism in the pathogenesis of systemic sclerosis (SSc) and rheumatoid arthritis (RA). SSc is a chronic inflammatory disease characterized by vascular injury, immunological abnormalities and widespread fibrosis of skin and internal organs. Although the etiology of disease is unknown, It is thought that oxidative stress has an important role in the pathogenesis. RA is a chronic disease characterized by inflammation in periferic joints. Although the pathophysiological basis of RA is not yet fully understood, some investigations have been shown that oxidative stress have implicated in its pathogenesis. In this study, the levels of malondialdehyde (MDA) and nitric oxide (NO), the activity of xanthine oxidase (XO) and erythrocyte superoxide dismutase (SOD) enzymes of patients with RA and SSc were investigated.

METHODS: Forthy-two patients with SSc, Forthy-three patients with RA and 40 healthy controls were taken into the study. The levels of serum MDA and serum NO, the activity of serum XO and erythrocyte SOD enzymes were determined. MDA levels was determined by the thiobarbituric acid method. NO levels were measured by griess method. XO activity was studied according to the method of Prajda and Weber. Erythrocyte SOD activity was assayed according to Sun et al. and Durak et al. SOD activity was expressed as U/gr Hb [SOD activity (U/ml)/Hb (gr/ml)]

RESULTS: While patients with SSc had significantly higher serum MDA levels compared to normal subjects ($p<0,008$); there were no difference between RA groups and normal subjects ($p= 1.00$). Besides patients and the control group did not show any difference the level of serum NO, the activity of serum XO and erythrocyte SOD ($p= 0.211$, $p= 0.593$, $p= 0.508$).

CONCLUSIONS: In conclusion, increased MDA levels in our study may be importance as a marker but are not sufficient to show that there is an increased oxidative stress in SSc patients because supporting results were not obtained from SOD, NO and XO measurements. In addition, in our study the similarity in the levels of MDA, SOD, NO and XO in RA patients might be related to the remission phase of the disease.

Oxidative stress

Cod: 1247

THE EFFECTS OF SILVER NANOPARTICLES ON THE GENOTOXICITY

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BACKGROUND: The aim of this study was to assess the genotoxic potentials of silver (Ag) nanopaticles on peripheral blood mononuclear leukocytes (ML) with an in vitro experiment.

METHODS: Human peripheral ML was isolated from fresh blood by using Histopaque 1077. Viability of the cells was evaluated by trypan blue dye exclusion method. All cells were cultured in DMEM equilibrated with 5% CO_2. Genotoxic activity was assessed by using single cell alkaline electrophoresis assay (Comet Assay) and micronucleus (MN) assay after treatment of Ag nanoparticles at various doses (12.5 to 250 μg/mL) on ML cells.

RESULTS: We have demonstrated that all the doses of the Ag nanoparticles significantly induced DNA damage in human peripheral ML and, the mean values of ML DNA damage were found to be dose dependent manner. Total DNA damage scores of the samples with 12,5, 50, 250 μg/ml were found 25 ± 1.66, 184 ± 0.52 and 290 ± 0.83 arbitrary unit respectively. The MN rates of treatment group were also significantly higher than those of control. The percentages of MN were 16 ± 0.77 in treatment group and 1 ± 0.33 in control group ($p<0.05$).

CONCLUSIONS: In conclusion, Ag nanoparticle caused genotoxicity, and oxidative stress may be responsible for the toxicity of these Ag nanoparticle. Further in vivo studies are nedeed to clarify the molecular mechanisms involved in the genotoxicity of Ag nanoparticles.
Key words: DNA damage, Micronucleus, silver nanoparticles

Oxidative stress

Cod: 1248

THE EFFECT OF THYMOQUINONE ON OXIDANT/ANTIOXIDANT SYSTEM IN SALIVARY GLAND OF RATS EXPOSED TO TOTAL CRANIAL IRRADIATION

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BACKGROUND: Treatment for a majority of patients with head and neck cancers includes radiation as part of their therapy. The patients treated with radiotherapy suffer severe side effects during and following their treatment. Salivary glands in the field of radiation are severely damaged, and radiation treatment can result in chronic salivary hypofunction. Xerostomia is a common and severe side effect and affects quality of life in these patients. A radioprotector amifostine is approved for head and neck cancer patients treated with radiotherapy to decrease radiation related salivary gland injury. Our goal was to investigate the radioprotective effects of thymoquinone (TQ) against radiation-induced damage in salivary glands of rats exposed to total cranial gamma irradiation.

METHODS: 32 Sprague-Dawley rats were used for the experiment. The rats were randomly divided into 4 equal groups. Control group (CG) only fed with standard laboratory chow and water. Sham control group (SCG) received dimethyl sulfoxide (DMSO) intraperitoneally (ip) injections at an equal volume of that TQ used in irradiation (IR) plus TQ group. IR group received total cranium 5 Gy of gamma irradiation as a single dose plus physiological saline ip. IR and plus TQ group received both 5 Gy of gamma irradiation as a single dose to total cranium and TQ (50 mg/kg/day daily by ip.) injection starting 30 minutes before the radiation dose and subsequently daily for 10 days after irradiation. TQ was dissolved in DMSO just before giving to the rats.

RESULTS: GSH-Px, GST, TSSA, NSSA, and SOD activities in the IR group were significantly decreased when compared to the CG and SCG's. NO•, ONOO–, MDA levels, XO and NOS activities significantly increased in the IR group when compared to the other groups.

CONCLUSIONS: Results showed that by reducing the formation of NO•, ONOO– and MDA, an indicator of lipid peroxidation, and decreasing XO, NOS activities, TQ had the antioxidant effects and a free radical scavenging activity and reduced oxidative and nitrosative stress conditions in the salivary gland of rats exposed to gamma irradiation.
Keywords : Thymoquinone, antioxidant enzymes, irradiation, oxidative stress, salivary gland

Oxidative stress

Cod: 1249

COQ10 LEVELS AND OXIDATIVE DNA DAMAGE IN PATIENT WITH MULTIPLE SCLEROSIS

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BACKGROUND: Multiple Sclerosis (MS) is a demyelinating disease of the nervous system. Reactive oxygen species-antioxidant balance in favor of the reactive oxygen species leads to the formation of oxidative stress. Evidence about Oxidative stress plays an important role in the pathogenesis of MS is increasing day by day. 8-hydoxy 2 deoxy guanosine is biomarker of oxidative DNA damage. Coenzyme Q10 (CoQ10) (ubiquinone) indicates oxidative damage in mitochondria. Malondialdehyde (MDA) is used for the evaluation of the oxidative damage in lipids. In our study, we aimed that determine oxidative DNA damage, oxidative damage in mitochondria and lipid in patients with MS.

METHODS: Blood samples were obtained from during an attack of MS patients (20 male and 10 female) (Group 1) and in the period between attacks (Group 2). In addition to blood samples for control group (Group 3) were obtained from 30 healthy volunteers. MDA levels in blood samples was detected using flourescence dedector with higy pressure liquid chromotograph (HPLC). DNA was extracted from leukocyte cells then we measured 8-OHdG by using HPLC methode with electirochemical detector and for measurement of deoxyguanosin was used UV detector. Measurement of COQ10 and COq10H was performed by using UV detector with HPLC method.

RESULTS: Serum MDA levels of Group 1 were significantly increased compared with Group 2 and Group 3 (Group 1: 4.57±2.36 μM, Group 2: 3.21±1.57 μM and Group 3: 2.76±1.00 μM respectively ; $p< 0.001$). Additionally levels of oxidative DNA damage (8-OHdG/ 106 dG) of Group1 (2.16±1.05) were significantly higher more than levels of Group 2 (1.3±0.35) and Group 3 (0.75±0.38) ($p< 0.001$). CoQ10/Coq10H rates of Group 1 were significantly increased compared with Group 2 and Group 3 (Group 1: 3.69±1.4, Group 2: 1.64±0.78 and Group 3: 1.14±0.73 respectively ; $p<0.001$).

CONCLUSIONS: In datas obtained from measurements, we detemined that oxidative DNA damage, lipid oxidative damage and mitocondria oxidative damage in patients with MS higher than the others gruops. In the light of these data, we concluded that oxidative stresses a play important role the pathogenesis of MS patients as well as induce attacks.

Oxidative stress

Cod: 1251

OXIDATIVE STRESS STATUS DURING UNCOMPLICATED PREGNANCY

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BACKGROUND: Pregnancy is a condition with increased susceptibility to oxidative stress. Evidence for this concept includes demonstrating elevated levels of oxidative stress markers in normal pregnancy and decreased antioxidative defence parameters.

METHODS: We monitored 42 pregnant women throughout pregnancy. Blood was sampled towards the end of each trimester. Additionally, 40 healthy women of reproductive age, but not pregnant, were recruited as controls. We measured serum thiobarbituric acid-reacting substances (TBARS), lipid hydroperoxide (LOOH), superoxide anion (O2•-), advanced oxidation protein products (AOPPs), redox balance (PAB), total sulphydryl (SH) groups and superoxide dismutase (SOD) activity by appropriate assays.

RESULTS: We didn't find some significant differences in TBARS concentrations in 1st , 2nd and 3rd trimesters compared with controls. The AOPP (15,4±7,46 μmol /L; 19,2±7,70 μmol /L and 21,3±6,88 μmol /L), LOOH (9,5±2,1 μmol / L; 9,5±1,80 μmol /L and 9,2±2,39 μmol /L), O2•- (78,0±24,4 μmol/ L; 82,7±85,31 μmol/L and 55,7±33,72 μmol /L) and PAB concentrations [107,1(102,9-123,3) HKunits; 146,0(142,5-154,2) HK units and 160,6(147,4-170,2) HKunits] were significantly higher compared with controls. SH group concetration (0,47±0,08 g/L; 0,40±0,06 g/L and 0,47±0,05 g/L) were significantly lower during pregnancy compared with controls (0,52±0,10g/L) and SOD activities were significantly lower (101,1±27,38 kU/L; 73,7±34,52 kU/L) until 3rd trimester when SOD activity significantly increased (143,2±38,00 kU/L) compared with controls (119,2±41,19 kU/L). We also noticed significantly increase of SOD activities in 3rd trimester compared with 1st and 2nd trimester.

CONCLUSIONS: The results of current study confirmed that pregnancy is a condition of increased oxidative stress. Increased activity of SOD during 3rd trimester explain the fact that pregnant women with normal course of pregnancy have preserved oxidative stress status.

Oxidative stress

Cod: 1252

OXIDATIVE STRESS AND APOPTOSIS IN BRAIN OF AGING RATS CAUSED BY D-GALACTOSE: PROTECTIVE EFFECTS OF CARNOSINE AND TAURINE

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BACKGROUND: D-galactose (GAL) has been used as an animal model for brain aging and antiaging pharmacology studies. GAL stimulates oxidative stress in several tissues including brain. Carnosine (CAR; β-alanil-L-histidine) and taurine (TAU; 2-aminoethanesulfonic acid) exhibit antioxidant properties. It has been proposed that CAR and TAU have anti-aging and neuroprotective effects.We investigated the effect of CAR and TAU supplementations on oxidative stress and brain damage in GAL-treated rats.

METHODS: Rats received GAL (300 mg/kg; s.c.; 5 days per week) alone or together with CAR (250 mg/kg/daily; i.p.; 5 days per week) or TAU (2.5% w/w; in rat chow) for two months. Brain malondialdehyde (MDA), protein carbonyl (PC) and glutathione (GSH) levels and superoxide dismutase (SOD), glutathione peroxidase (GSH-Px) and glutathione transferase (GST) activities were determined. Expressions of B cell lymphoma-2 (Bcl-2), Bax and caspase-3 were also evaluated in the brains by immunohistochemistry.

RESULTS: GAL treatment caused significant increases in MDA and PC levels in the brain. This treatment was observed to decrease significantly GSH levels, SOD and GSH-Px activities. However, GST activities remained unchanged following GAL treatment. GAL treatment resulted in histopathological changes and increased apoptosis. CAR and TAU significantly reduced MDA and PC levels and elevated GSH levels in brain tissues of GAL-treated rats. CAR, but not TAU, significantly increased low activities of SOD and GSH-Px. Both CAR and TAU diminished apoptosis and ameliorated histopathological findings in the brains of GAL-treated rats.

CONCLUSIONS: According to our results, CAR and TAU supplementations seem to be useful for decreasing brain oxidative stress and apoptosis together with histopathological ameloriation in the brains of GAL-treated rats.

Oxidative stress

Cod: 1253

COMPARISON OF THE BITTER APRICOT KERNEL AND AMYGDALIN EFFECTS BY THE OXIDATIVE STRESS AND APOPTOSIS MARKER'S IN CARBON TETRACHLORIDE (CCL4) INDUCED RAT LIVER

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BACKGROUND: Carbon tetrachloride can be used as a model of hepatic injury in rats. Amygdalin was used as a cynagenic agent for anticancerogen and antioxidant include in bitter apricot kernel.

METHODS: This study was planned to investigate the protective effect of 3% and 5% bitter apricot kernel containing feed and treated with amygdalin on carbon tetrachloride (CCl4)-induced hepatic damage with apoptosis and oxidative stres. Adult male Wistar rats (n = 64) were divided into eight groups of each, as follows: (i) control group; C; (ii) CCl4 group; CCl4; (iii) Amygdalin 50 mg/kg in drinking water, (iv) Amygdalin and CCl4; (v) 3% bitter apricot kernel group; (vi) 5% bitter apricot kernel group; (vii) CCl4 and 3% bitter apricot kernel group; (viii) CCl4 and 5% bitter apricot kernel group. All apricot groups were fed with 3% or 5% bitter apricot-kernel containing feeding for 28 days. CCl4 injections were applied to the CCl4 groups at the dose of 1 mg/kg for 3 d at the end of 28 days.

RESULTS: The liver injury was found significantly decreased with bitter apricot kernel feding and amygdalin treatment. Bcl 2, Bax, Caspase 3, Nf Kappa B and Nrf 2 activities were significantly ($P<0.001$) changed in the CCl4 group and indicated increased oxidative stress. Bitter apricot kernel feeding decreased this oxidative stress and ameliorated apoptotic damage.

CONCLUSIONS: We concluded that bitter apricot kernel feeding had beneficial effects on CCl4-induced liver injury and damage probably due to its amygdaline contents and high radical-scavenging capacity. Dietary intake of amygdaline and bitter apricot kernel ratio of 3% can reduce the risk of liver steatosis and damage caused by free radicals. This study most important is that the original value because of the never have been studied in previous reports.

Oxidative stress

Cod: 1254

ASSOCIATION OF OXIDATIVE SYSTEM COMPONENTS WITH CHRONIC LIVER INFLAMMATION

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BACKGROUND: It is established that oxidative stress is one of the main mechanisms that affects the liver injury. Chronic inflammation of the liver, such as fatty liver disease (steatosis), provides more substrate for oxidative stress and active lipid peroxidation. The aim of the study was to investigate blood markers related with oxidative process: glutathione (GSH) and oxidized low density lipoproteins (ox-LDL) concentration in plasma samples of individuals with steatosis and to detect association of oxidant/antioxidant system components with chronic liver inflammation process.

METHODS: The blood samples of 42 individuals were investigated: study consisted of the group of 27 patients with steatosis and the group of 15 individuals (control) without the liver inflammatory signs. Ox-LDL concentration was measured by ELISA, using a specific monoclonal antibody mAb-4E6 (Mercodia, Sweden). Reduced glutathione (GSH) concentration was analyzed by ELISA (Cusabio, China).

RESULTS: Ox-LDL levels exceeded the recommended rate rate (50 U/L) 81.48% of patients with hepatic steatosis and 66,67% in the group of subjects without hepatic inflammatory signs. Statistically significant (p=0.037) higher concentration of ox-LDL was estimated in patients with hepatic steatosis compared with the control group. GSH concentration were significantly (p=0.006) lower in patients with hepatic steatosis. There was no estimated correlation between ox-LDL and GSH in the both of groups.

CONCLUSIONS: The received results showed that glutathione (GSH) synthesis in the liver is decreased with presence of steatosis - hence LDL oxidation is not suppressed. So the increase of low-density lipoprotein oxidation is related with liver steatosis, when oxidative process in hepatocytes is more active. A statistically significant decrease of anti-oxidant system components and increase in the concentration ox-LDL and may promote the progression of chronic liver inflammation.

Oxidative stress

Cod: 1255

EFFECT OF SHORT TERM INSULIN REGIMEN ON OXIDATIVE STRESS IN TYPE 2 DIABETES MELLITUS

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BACKGROUND: Diabetes mellitus is better known for its complications, which are extremely costly in terms of longevity and quality of life. Increased oxidative stress /damage is a widely accepted contributing factor towards development and progression of diabetes and its complications. Aims and Objectives: MDA (Malondialdehyde) is used as an index of oxidative damage and has the ability to interact with lipoproteins.

METHODS: The present study examines the extent of oxidative damage and alteration of lipid profile in 600 type 2 DM cases and 250 age and gender matched subjects.

RESULTS: Diabetics reveal increased oxidative damage as reflected by their higher MDA level in comparison to normal controls (5.30±2.8 vs 4.6±0.83). Among the diabetics dyslipidemia (48.3%)and higher BMI (66.6% > 22.9) are frequent. The study reveals that patients on short term insulin regime show considerably low levels of MDA (3.41±1.4 mmol./L), lowered serum triglycerides (43±99) as compared to cases on OHA and other regimes.

CONCLUSIONS: Therefore short term insulin regimen should often be recommended to type 2 DM cases not only as an efficient means of glycemic control, but as an active agent for reducing oxidative stress. In conclusion short term insulin regimen is advocated for long term health benefits in type 2 DM.

Oxidative stress

Cod: 1256

SERUM MALONDIALDEHYDE LEVELS AND SUPEROXIDE DISMUTASE ACTIVITIES IN PATIENTS WITH GASTRIC CANCER

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BACKGROUND: Gastric cancer mortality has declined markedly around the world. An increasing amount of epidemiological and experimental evidence has been carried out on the relationship between free radicaly activity and malignancy. The aim of this study was to determine of serum malondialdehyde (MDA) levels and superoxide dismutase (SOD) activities and the correlation of these parameters in patients with gastric cancer.

METHODS: The levels of serum MDA and SOD activities were assessed in 44 patients with gastric cancer and 20 control subjects. Serum MDA and SOD activities levels were measured using a specific enzyme-linked immunosorbent assay.

RESULTS: Serum MDA levels in patients with gastric cancer (2.27±1.83) were not significantly higher than the control group (2.89±0.61) (p:0.051). Serum SOD activities in patients with gastric cancer (4.39±2.25) were not significantly higher than the control group (4.76±1.54) (p=0.0509). There was no correlation between serum MDA levels and SOD activities (p:0.126 r: 0.195).

CONCLUSIONS: The results of the present study demonstrated that serum malondialdehyde and superoxide dismutase levels are not a useful parameters for evaluate patients with gastric cancers.
Keywords: Gastric Cancer; MDA; SOD

Oxidative stress

Cod: 1257

OXIDATIVE STRESS AND ANTIOXIDANT VITAMIN AND ELEMENT LEVELS IN PATIENTS WITH SCHIZOPHRENIA

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BACKGROUND: The study aims to determine MDA (malondialdehyde), vitamins C, E and selenium levels in the schizophrenia and control group patients. The other purpose of the study is to investigate the relationship between schizophrenia and the parameters by comparing the measured parameters with each other.

METHODS: The study sample included 31 patients who were diagnosed with schizophrenia. Thirty-one healthy volunteers of the similar age with a smoking habit were matched by gender. They comprised the control group. In the patients and the control group, plasma MDA level was measured with the thiobarbituric acid method, serum vitamin E level with the Martinek method, plasma vitamin C level with the dinitrophenyl hydrazine method and serum selenium level with the Atomic Absorption Spectrophotometer.

RESULTS: There were no significant differences between the two groups in terms of vitamin E and vitamin C levels. Plasma MDA levels in the schizophrenia group were significantly higher than were those in the control group ($p < 0.001$). Serum selenium levels in the schizophrenia group were significantly lower than were those in the control group ($p < 0.00$). When the relationship between the parameters was considered, it was determined that there was an inverse proportion between MDA and selenium levels: the more MDA levels increased, the more selenium levels decreased.

CONCLUSIONS: The fact that the mechanisms of schizophrenia which has a wide variety of clinical symptoms and a disease process have yet to be elucidated reveals the importance of this kind of studies. In our study, low levels of selenium which is antioxidant and high levels of MDA which is the indicator of oxidative stress suggest that oxidative stress-mediated neuronal damage may play a role in the pathogenesis of schizophrenia too. Therefore, we consider that more research should be performed with larger sample groups.

Oxidative stress

Cod: 1258

THREE DIFFERENT METHODS' PROPERTIES TO MEASURE ERYTHROCYTE CATALASE ACTIVITY

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BACKGROUND: Oxidative stress results from increased concentrations of reactive oxygen species and/or a reduction in antioxidants. Catalase is a primary component of the antioxidant system, that defends against oxidative stress which is ubiquitously associated with pathologic conditions, including cancer, metabolic diseases, atherosclerosis, neurodegenerative disease, nutritional deficiencies, and aging. The overall reaction catalysed by catalases is the degradation of two molecules of hydrogen peroxide to water and oxygen. The ubiquity of the enzyme, its ease of assay, involving a cheap, readily available substrate, H_2O_2, and the spectacular display of oxygen evolution have combined to make it an attractive target for biochemists and molecular biologists alike. Biochemical and physiological characterization of catalases from many different organisms has revealed a surprisingly wide range of catalytic efficiencies, despite similar sequences. Catalases, hydroperoxidases, are one of the most studied classes of enzymes. Many methods for measuring catalase activity have been described. Catalase activity in erythrocytes was measured according to commonly used methods as a function of the antioxidant defence system. Our aim is to evaluate the different methods of measurement of erythrocyte catalase activity.

METHODS: Human erythrocytes were washed and hemolysed. Catalase activity was applied 1000-fold dilution of erythrocyte lysate with phosphate buffer. Catalase activity was measurement in the erythrocyte lysate using the method of Aebi et all, Cohen et all and Goth et all, respectively. The hemoglobin content of the erythrocytes was determined by the cyanmethemoglobin method.

RESULTS: Erythrocyte catalase activity, was no significant difference between the three methods. However, oxygen bubbles in the method of Aebi were continuing.

CONCLUSIONS: In the measurement of catalase activity, buffer properties, H_2O_2 concentration, blank properties, methods of standardization, there are differences in the application and methods. When considering these variables, erythrocyte catalase activity measurement of each method effective than another is not mentioned.

Oxidative stress

Cod: 1259

STUDY OF THE EFFECT OF GREEN TEA ON MARKERS OF OXIDATIVE STRESS IN TUNISIAN STUDENTS

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BACKGROUND: Green tea, an infusion prepared with the leaves of Camellia sinensis is particularly rich in flavonoids, which are strong antioxidants. Our aim was to evaluate the effect of green tea on oxidative stress parameters represented by: thiobarbituric acid-reactive substances (TBARS), total antioxidant status (TAS), superoxide dismutase (SOD), glutathione peroxidase (GPx), and glutathione reductase (GR) activities.

METHODS: Our study had involved 60 unrelated healthy students, mean age 23±1year, were recruited in the school inspector training police (Sousse-Tunisia). We measured the parameters of oxidative stress before and after consumption of green tea over a period of 1 month. The TBARS assay was performed by fluorimetric assay (Yagi method). TAS and erythrocyte SOD, GPx and GR activities were determined by spectrophotometric methods (Randox kits).

RESULTS: Our study showed a decrease of TBARS after consumption of green tea (TBARS (Before/After): 0.56 ± 0.15 µmol/l vs 0.27 ± 0.09 µmol/l; P $<10^{-3}$), while an increase of TAS was observed (TAS (Before/After): 1.75 ±0.19 mmol/l vs 2±0.24 mmol/l; P $<10^{-3}$). We also found an increase of antioxidant enzyme activities after consumption of green tea (SOD (Before /After): 1652 ±605 U/ gHb vs 2090±509 U/ gHb; P $<10^{-3}$; GPx (Before /After): 78.22 ±14.50 U/ gHb vs 106.93±18.87 U/ gHb; P $<10^{-3}$; GR (Before/After): 9.92 ±2.23 U/ gHb vs 13.10±3.49 U/ gHb; P $<10^{-3}$).

CONCLUSIONS: The significant decreases of TBARS levels and increase of antioxidant parameters in subjects consuming green tea reflects the beneficial role of polyphenols, which constitute the active ingredient in green tea.

Oxidative stress

Cod: 1260

EVALUATION OF SOME ANTIOXIDANT ENZYME POLYMORPHISMS IN BEHÇET'S PATIENTS

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BACKGROUND: Behçet's disease is a chronic inflammatory disease. It is characterized by oral aphthous ulcers, genital ulcers, skin lesions and ocular involvement. The causes of the Behçet's disease is not understood yet. The factors like, genetic and environmental factors, immune responses caused by infectious agents and coagulation system disorders can cause the disease has been expressed. The oxidative stress is the one of the reasons that has a relation with Behçet's disease. SOD2, GPX1 and PON1 are antioxidant enzymes. SOD2 Ala-9Val, GPX1 Pro198Leu, PON1 L55M and PON1 Q192R polymorphisms are located on the genes that coding these enzymes and cause decrease in enzyme activity. In this study, we aimed to investigate the role of these polymorphisms in Behçet's disease.

METHODS: 110 Behçet patients and 100 healthy control subject were included in this study. DNA was isolated from whole blood samples of individuals who participated in the study. Genotyping was performed Real-Time PCR using hybridization probes. SOD2 Ala-9Val, GPX1 Pro198Leu, PON1 L55M and PON1 Q192R polymorphisms were detected with melting curve analyzing. Genotype frequency, allele frequency and relative ratio of genotype frequency were obtained. Patients and control groups were compared statistically using these findings.

RESULTS: No significant difference was found in allel frequency, genotype frequency and relative ratio of genotype frequency of SOD2 Ala-9Val, PON1 L55M and PON1 Q192R polymorphisms between patient and control subjects. A significant difference in the allele frequency of the GPX1 gene was found between patient and control subjects; the frequency of the Leu allele in the patients was significantly higher than in the control subjects (P=0,037, OR=1,52, 95% CI (1,02-2,27)). Increased risk for Behçet's disease was determined in individuals carrying Leu allele heterozygous or homozygous (Pro/Leu+Leu/Leu) (P=0,048, OR=1,75, 95% CI (1,0005–3,06)).

CONCLUSIONS: As a result; GPX1 Pro198Leu polymorphism that is studied for the first time in Behçet's disease, might be a genetic risk factor for Behçet's disease.

Oxidative stress

Cod: 1261

BLUEBERRY TREATMENT ATTENUATED PROGRESSION OF FIBROSIS TO PRENEOPLASTIC LESIONS AND OXIDATIVE STRESS IN THE LIVER OF DIETHYLNITROSAMINE-TREATED RATS

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BACKGROUND: Diethylnitrosamine (DEN) is a powerful hepatocarcinogenic agent. DEN induces hepatocyte injury and promotes liver fibrosis and cancer in rodents. DEN-induced liver cancer normally develops in stages that progress from injury to fibrosis/cirrhosis and carcinoma. Alterations in DNA structure and increases in oxidative stress play an important role in DEN-induced carcinogenicity. Blueberries (BB;Vaccinium corymbosum L.) contain high levels of polyphenols and have high antioxidant capacity. BB was reported to exert protective effects in acute and chronic liver damage. We investigated the effect of BB supplementation on DEN-induced fibrosis and its progression to neoplastic lesions in the liver.

METHODS: Rats were injected with DEN (200 mg/kg; i.p.) three times at an interval of 15 days and were killed after 16 weeks. DEN-treated rats were also fed on 8% BB (w/w) containing chow during this period. Serum alanine aminotransferase (ALT), aspartate aminotransferase (AST) and lactate dehydrogenase (LDH) activities were determined together with hepatic histopathological examinations. Malondialdehyde (MDA), diene conjugate (DC), protein carbonyl (PC) and glutathione (GSH) levels, and CuZn-superoxide dismutase, catalase, glutathione peroxidase activities, and their mRNA expressions were determined. Protein and mRNA expressions of glutathione transferase- pi (GST-pi) were also examined as a marker of preneoplastic lesions.

RESULTS: DEN treatment caused significant increases in serum ALT, AST and LDH activities together with fibrotic changes in the liver. Hepatic MDA, DC, PC and GSH levels increased, but antioxidant enzyme activities and their mRNA expressions decreased. Expressions of GST-pi were detected to increase. However, BB supplementation decreased hepatic damage markers in serum and fibrotic changes in liver tissue. MDA, DC and PC levels decreased without any change in antioxidant enzyme activities and their mRNA expressions. Protein and mRNA expression of GST-pi also decreased due to BB.

CONCLUSIONS: Our results indicate that BB is effective to decrease DEN-induced hepatic fibrosis and its progression to preneoplastic lesions by acting as an antioxidant (radical scavenger) itself without affecting activities and mRNA expressions of antioxidant enzymes.

Oxidative stress

Cod: 1262

THE EFFECT OF DIETHYLHEXYLPHTHALATE AND CLOFIBRATE ON THE OXIDATIVE STRESS ENZYMES IN WISTAR RATS LIVER

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BACKGROUND: D(2-ethylhexyl phthalate) (DEHP) continually enters the human body via food, water, and the atmosphere. Human exposure to DEHP also occurs via PVC-containing medical devices that are used in intravenous therapy, enteral and parenteral nutrition support, blood transfusion, hemodialysis, cardiopulmonary bypass, and extracorporeal membrane oxygenation. Recent safety assessments of DEHP have attracted much public interest. Clofibrate is a lipid-lowering agent which application was discontinued in 2002 due to adverse affects. The aim of our study was to compare the effect of diethylhexilphthalate and clofibrate on the activity of catalase and palmitoil CoA oxidase in Wistar rats liver.

METHODS: Male Wistar rats were treated with diethylhexylphthalate and clofibrate in a dose of 250 mg/24h/kg for 10 days via guavage. Control group was receiving distillated water for 10 days. Catalase and palmitoyl CoA oxidase were determined in the liver homogenates by spectrophotometric methods according to Aebi and Hryb and Hogg respectively. Statistical analyze was performed utilizing the WinStat software.

RESULTS: DEHP showed almost 6 times significant lower up-regulation of the palmitoyl CoA activity in comparison to clofibrate. Catalase was down-regulated in DEHP treated group and statistically significant ($p<0.05$) up-regulated in clofibrate treated group.

CONCLUSIONS: Although the up-regulation of palmitoyl CoA oxidase by DEHP is not in the same extend as the one observed from clofibrate, it might contribute to development of oxidative stress and toxic affects of this compound.

Oxidative stress

Cod: 1263

EFFECT OF PROPOLIS EXTRACTS ON CATHEPSIN SECRETION FROM KML-62 CELL LINES

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BACKGROUND: Propolis is a resinous product that bees collect from different plant sources and use in the defense of the bee community by coating and strengthening the inside walls of the hive. Nearly all endolysosomal proteases are called cathepsins, which predominantly include a group of cysteine and aspartic proteases sharing distribution specifically in the endocytic pathway. We wanted to show if cathepsin secretion from KML-62 cancer cell lines could be influenced when incubated with propolis extracts or not.

METHODS: Propolis extracts at concentrations of 0, 12.5, 25 and 50 mg/ml were prepared by dimethyl sulfoxide. KML-62 cell cultures and lymphocyte cultures by preparing peripheral blood as control cells were incubated with extracts for 24 hours. Cathepsin secretion was determined by CellProbe reagent (TP Cathepsin, Beckman Coulter) by using flow-cytometric fluorescence analysis.

RESULTS: While about 85% fluorescence positivity was obtained with 0 concentrations for both KML-62 and lymphocyte cell cultures, whereas it was about 15% for cancer cell lines and 34% for lymphocytes as did not depend on propolis concentration.

CONCLUSIONS: It was concluded that propolis extracts inhibit cathepsin secretion from cancer cell lines probably by its antioxidant potential.

Oxidative stress

Cod: 1264

ANTIOXIDANT EFFICIENCY OF SEABUCKTHORN EXTRACT IN EHRLICH ASCITES CARCINOMA OF BALB/C MICE MODEL

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BACKGROUND: Seabuckthorn (SBT; Hippophae rhamnoides L.), a unique and valuable plant has recently gained worldwide attention, mainly for its medicinal and nutritional potential. The aim of the present study was to evaluate the antioxidant activity of SBT against Ehrlich Ascites Carsinoma (EAC) cells by measuring primer antioxidant enzyme superoxide dismutase (SOD) and lipid peroxidation products malondialdehyde (MDA).

METHODS: Mice were divided into three groups. First group was control. Second group was injected EAC interperitoneally. Third group was received both EAC and SBT extract daily 10U for 3 weeks. All groups received diet and water ad-libitum. Both control and experimental groups SOD activities, MDA levels and EAC cells protein contents were determined by the methods of Sun, Buege JA and Lowry, respectively.

RESULTS: Both in ascetic fluid and EAC cells, EAC group MDA levels (93.27±5.63, 220.31±13.91 nmol/mg protein, respectively) were significantly high when compared with EAC treated with SBT group (26.61±4.18, 121.59±5.24 nmol/mg protein, respectively) ($p<0.001$). Although, SOD activity was found decreased in ascetic fluid ($p<0.001$), same enzyme activity was found increased in EAC cells ($p<0.001$). When plasma EAC group compared with control, high levels of EAC plasma MDA levels were found ($p=0.001$). But, SBT application on EAC showed that plasma oxidative stress were found decreased by MDA levels ($p<0.001$).

CONCLUSIONS: According to these results, increased SOD activity by SBT implementation in EAC cells shows that radical metabolism is still active in EAC cells. SBT has antioxidant effect in ascetic fluid when significantly decreased SOD activity is considered. It is the case that plasma MDA levels significantly deplete and also SBT indicates antioxidant effect to whole body by circulation.

Oxidative stress

Cod: 1265

OBESITY AND POLYMORPHISM GENES OF SUPEROXIDE DISMUTASE (SOD2) AND GLUTATHIONE PEROXIDASE (GPX1)

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BACKGROUND: The obesity is the most frequent nutritional pathology as well in the industrialized countries as in the rest of the world. The obesity is known as a risk factor of numerous pathologies such as the cardiovascular diseases and the cancers. The oxidative stress was shown to play an essential role in the pathogenesis of these diverse diseases. A study realized on healthy grown-up obese men showed a significant decrease of the activity of the antioxidant enzymes (superoxide dismutase (SOD) and glutathion peroxydase (GPx)). The antioxidant power varies from a person to another one; it depends on the nutrition but also on the genetics. The objective of our work consists essentially in looking for a possible association between the genetic polymorphisms of the genes GPx1 (Pro198Leu) and SOD2 (Ala16Val) and the obesity.

METHODS: Our analysis concerned 55 grown-up obese subjects without pathologies under neighboring and 94 not obese subjects. We used the method PCR-RFLP for the exploration of polymorphisms.

RESULTS: The distribution of the genotypes of the genes SOD2 and GPx1 are similar in both groups.

CONCLUSIONS: The study of the biological profile of obese according to their genotypes GPx1 showed a rise of the weight body in variant (Leu /Leu).

Oxidative stress

Cod: 1266

STUDY ON THE BEHAVIOR OF RATS SEPARATED (MOTHER NEWBORN)

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BACKGROUND: In humans, genetic and environmental factors influence susceptibility to many diseases. In particular, the quality of relationships between a child and his mother plays a key role in the harmonious development and the subsequent balance of this individual. The animal experimental designs are developed to determine the neurobiological disturbances underlying vulnerability to these disorders. The modeling in animals remains relative.

METHODS: The work presented in this paper was conducted on a mother/newborn separation design in rats. Rats are separated from their mother and isolated from their counterparts every day during 5 min, 30 min and one hour from their third to their 14th day of life. Studies have already been carried out, in this model, in rats become adults.

CONCLUSIONS: It was this time to analyze the different behavioral tests which be explained, and then the results will be discussed and compared to those of the literature review.
Keywords: separation stress, separation5 min, separation30 min, separation1 hour, newborn, rat

Oxidative stress

Cod: 1267

ASSOCIATION OF OXIDATIVE STRESS AND ALTERED BIOCHEMICAL PARAMETERS IN PERIMENOPAUSAL WOMEN RECEIVING YOGA THERAPY IN THE COASTAL REGION OF KARNATAKA, INDIA

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BACKGROUND: Perimenopause, a form of reproductive aging, refers to the time period before, during and after menopause. Oxidative stress plays an integral part of the aging process. Regular practice of yoga has been found to be effective in combating the oxidative stress associated with many diseases and improving serum lipid concentration, glycemic index and antioxidant activity (AOA). The purpose of this study was to analyze the effects of yoga on glycemic index, serum lipid profile, thyroid stimulating hormone (TSH), cortisol and AOA in perimenopausal women residing in the coastal region of Karnataka.

METHODS: 111 women aged 40 to 60 years with perimenopausal symptoms were recruited considering inclusion and exclusion criteria set for the study. Our participants were checked for glycemic index, serum lipid profile, TSH, cortisol and AOA levels before and after 12-weeks of yoga intervention.

RESULTS: Yoga therapy intervention resulted in significant decrease ($P < 0.05$) in fasting blood sugar, glycated hemoglobin ($P < 0.03$), total cholesterol(TC) ($P < 0.06$), low density lipoprotein cholesterol(LDL-C) ($P < 0.04$), TC/HDL-C ratio ($P < 0.002$). Serum triglyceride concentration is decreased whereas high density lipoprotein cholesterol (HDL-C), TSH and AOA was increased within the normal range after the intervention, though the change was not significant. Cortisol showed no significant change after yoga therapy intervention. There was a positive correlation between glycated hemoglobin and cortisol in both pre [$r = 0.274$, ($P < 0.01$)] and post yoga groups [$r = 0.352$, ($P < 0.01$)] and between TSH and LDL-C in both pre [$r = 0.337$, ($P < 0.01$)] and post yoga groups [$r = 0.227$, ($P < 0.05$)]. The positive correlation was also observed between AOA and diastolic blood pressure in the post intervention samples [$r=0.280$, ($P<0.01$)].

CONCLUSIONS: Our findings indicate that yoga helps in improving the glycemic index, serum lipid profile, TSH and AOA in perimenopausal women. Thus it can be effectively used to improve the quality of life in perimenopausal women.

Oxidative stress

Cod: 1268

DETERMINING OXIDANT AND ANTIOXIDANT STATUS IN PATIENT WITH GENITAL WARTS

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BACKGROUND: Genital warts are usually appear in the perianal and perigenital region. Asymptomatic warts may activate after years and damage the natural immunity. The inflammation that occurs during this process, may lead to imbalance between the prooxidant and antioxidant system. This imbalance can produce oxidative stress in body.

METHODS: The aim of this study is to determine the oxidative and anti-oxidative changes in patients with genital warts. In this study 67 subjects were evaluated, 32 of them were diagnosed with genital wart (patient group) and the other 35 subjects were healthy (control group). Subjects didn't have any active infections at the begining of the study All of cases had not any treatments for genital wart before this study and non of them used antioxidant drugs for the last three months. PON-1, MDA, LDL-c, HDL-c, sdLDL-c, GSH-Px, CAT, triglycerides and total cholesterol levels were measured in both patient and control groups.

RESULTS: In the patient group, MDA, CAT and GSH-Px levels were found significantly higher than the control group ($p < 0,05$). Triglyceride levels, were significantly lower in the patient group ($p < 0.01$). The detected sdLDL-c values were at the low levels in the control group although the difference was not statistically significant ($p > 0.05$). Total cholesterol, HDL-c, LDL-c and PON - 1 values were not significantly different between the two groups ($p > 0.05$).

CONCLUSIONS: The results of this study suggest that, oxidative stress in patients with genital warts is increased and on the other hand antioxidant defense mechanisms makes a compensatory response against that.

Oxidative stress

Cod: 1270

METABOLIC ALTERATION IN NEUTROPHILS OF PATIENTS WITH CHRONIC KIDNEY FAILURE

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BACKGROUND: Oxidative stress is considered as one of the leading mechanisms of development of chronic kidney failure. Data were obtained about increase in oxidized proteins in blood plasma of patients with chronic kidney failure (CKF), but there was no research of various types of oxidized proteins in blood cells particularly in neutrophils. The purpose of our study: to determine the content of reactive carbonyl derivatives and advanced oxidation protein products (AOPP) in neutrophils of patients with CKF, depending on the initiating nosology.

METHODS: Object of study: blood neutrophils of patients with CKF (chronic pyelonephritis (CPN) - 78 people, chronic glomerulonephritis (CGN) - 28 people) and healthy donors. The content of AOPP in the lysate of neutrophils was determined by the method Witko-Sarsat et al. (1996). The content of reactive carbonyl derivatives of proteins in the blood neutrophils was determined by the R.L. Levine et al. (1990).

RESULTS: A level carbonyl derivatives in neutrophils of patients with CPN was higher than control in 35.5 times ($p<0,001$). Patients with CGN had this parameter exceeding the control in 19 times ($p<0,001$). The content of reactive carbonyl derivatives of proteins in the blood neutrophils of patients with CPN was higher by 86% than in patients with CGN ($p<0,001$). The content AOPP in neutrophils of patients with CPN and CGN were lower than control by 47.6% and 24% respectively. No significant differences were found between research groups in content AOPP.

CONCLUSIONS: Accumulation of reactive carbonyl derivatives of proteins in neutrophils indicates the development of the intracellular carbonyl stress, which can cause metabolic disorder neutrophils.

Oxidative stress

Cod: 1271

OXIDATIVE STRESS BIOMARKERS IN HUMAN IMMUNODEFICIENCY VIRUS PATIENTS ON ACTIVE ANTIRETROVIRAL THERAPY IN NORTHERN NIGERIA

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BACKGROUND: Human Immunodeficiency Virus (HIV) infection is pandemic, with no cure. The use of highly active antiretroviral therapy (HAART) for the management of HIV has improved the wellbeing of the patients. Although HAART has improved HIV outcome, chronic oxidative stress has posed a challenge in these patients.
This study was designed to assess the plasma of total antioxidant (TAA), reduced glutathione (GSH), malondialdehyde (MDA), albumin and total protein in newly diagnosed HIV patients at baseline, 3month, 6month, 9month and 12month therapy respectively as possible biomarkers of oxidative stress.

METHODS: Two hundred newly diagnosed HIV positive patients that were also negative for hepatitis B & C were recruited for this study. Blood samples at baseline and after HAART treatments at 3months interval for 12months were taken. One hundred volunteers who were negative for HIV, hepatitis B and C were included as controls. All biochemical parameters were determined using standard biochemical procedures.

RESULTS: Results show significantly reduced plasma TAA, GSH, albumin and total protein ($p<0.001$) at baseline compared with the corresponding control values. The MDA ($p < 0.001$) at baseline was significantly higher than the control value. The plasma TAA, GSH, albumin and total protein ($p < 0.001$) were significantly decreased at 3month, 6month, 9month and 12month therapy respectively. On the contrary MDA ($p < 0.001$) at baseline was significantly reduced compared with the 3month, 6month, 9month and 12month therapy values.

CONCLUSIONS: Decreased TAA, GSH, albumin and total protein concentrations and elevated MDA at baseline, after 3 month, 6 month and 12 month therapy respectively are indicators of the presence of oxidative stress in HIV patients with or without HAART. Micronutrients supplementation may be beneficial in ameliorating this burden.
Keywords: HIV, HAART, oxidative stress, therapy

Oxidative stress

Cod: 1272

BREAST CANCER AND POLYMORPHISM GENES OF SUPEROXIDE DISMUTASE (SOD2) AND GLUTATHIONE PEROXIDASE (GPX1)

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BACKGROUND: Oxidative stress is defined as the result of an imbalance between oxidants and systems antioxidant capacity of an organism, a cell or a cell compartment. The installation of oxidative stress is generally associated with significant and irreversible damage affecting various biological macromolecules (carbohydrates, lipids, proteins, DNA) of the body and thereby promoting the development of disease. Of these, breast cancer is currently one of the public health issues most important in the world because of its high frequency and its multifactorial etiology. The objectives of our work is to (i) assess the variation of enzyme activity of the main antioxidant defense enzymes: superoxide dismutase (SOD) and glutathione peroxidase (GPx), and the variation of total antioxidant status (TAS) in healthy women and patients, (ii) search for a possible association between genetic polymorphisms of genes GPX1 (Pro198Leu) and SOD2 (Ala16Val) and the risk of developing breast cancer and (iii) identify environmental factors in susceptibility to breast cancer.

METHODS: Our study population was composed by a group of 65 women with breast cancer and a group of 80 healthy women. The enzyme activities and TAS were investigated by kit of Randox lab. Genotypes were determined by use of PCR-RFLP.

RESULTS: The main results we can derive from this study are: (i) a reduction in the enzymatic activity of SOD and SAT in those patients compared to healthy subjects, (ii) an association between the polymorphism Ala16Val (specifically the homozygous Ala / Ala SOD2 gene) and the risk of breast cancer in women aged under 45 years.

CONCLUSIONS: Oxidative stress and the SOD2 polymorphism may contribute to an increased risk for breast cancer development, particularly in the presence of late age at premenaupausal status.

Oxidative stress

Cod: 1273

OXIDATIVE STRESS IN PERIODONTAL DISEASE: TUNISIA STUDY

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BACKGROUND: Oxidative stress reflects an imbalance between the systemic manifestation of reactive oxidative species and a biological system's ability to readily detoxify the reactive intermediates or to repair the resulting damage. Oxidative stress is thought to be involved in the development of several diseases such as periodontal diseases. Our study aimed to evaluate the involvement of oxidative stress markers such as Thiobarbituric acid (TBARS), Glutathione peroxidase (GPx) and Catalase (CAT) in periodontal diseases.

METHODS: A total of 80 periodontal patients (39 mean aged) were recruited from dental clinic. Our study had included 50 healthy subjects free from coronary disease and liver failure. CAT activity was assayed using colorimetric test (Goth assay).Thus; the levels of TBARS were determinate according to YAGI method. The activity of GPx was measured using enzymatic test at 340 nm (Randox kits).

RESULTS: TBARS levels were increased in patients compared to healthy (3.06 vs 0.84 µmmol/l $p<0.001$). However, both CAT and GPx activity were reduced in patients rather than healthy (for CAT: 1.95 vs 13.38 ku/l; $p<0.001$ and for GPx: 146.25 vs 557.26 u/l).

CONCLUSIONS: Referring to our study, periodontal diseases were clearly associated with diminished antioxidant capacity and increased levels of pro-oxidant elements such as TBARS. Therefore, we suggest that oxidative stress could be directly involved in the pathogenesis of periodontal disease.

Oxidative stress

Cod: 1274

ESTIMATION OF THE POSTMORTEM INTERVAL BY MEASURING BRAIN AND RENAL TISSUE SUPEROXIDE DISMUTASE, GLUTATHIONE PEROXIDASE AND MALONDIALDEHYDE LEVELS

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BACKGROUND: Estimation of the postmortem interval (PMI) is one major area of interest in forensic medicine. In the absence of someone who has witnessed the moment of death, determination of the time of death is more important for the judicial decision process. Previously, many micro and macro changes were examined to determine time of death, but any single method has not yet provided sufficient performance. In our study, we investigated changes of superoxide dismutase (SOD), glutathione peroxidase (GSH-Px) and malondialdehyde (MDA) levels in rat brain and renal tissues in the PMI and examined the potential changes that are useful for an estimation of time of death to contribute to existing knowledge from a biochemical perspective.

METHODS: Forty albino female rats were used in this study.The rats were sacrificed and divided into five groups: group 1: 0 h, group 2: 6 h, group 3: 12 h, group 4: 24 h and group 5: 48 h). The rats were house at room temperature (22˚C ±2˚C) for the defined period for each group, and their brains and kidneys were excised and compared.

RESULTS: The MDA concentrations were significantly different between groups at both renal and brain tissues (brain-tissue, P=0.007; renal tissue, P=0.003). The diagnostic adequacy of MDA was calculated. For MDA concentrations measured in brain tissue; if the cut-off level was selected at 18.92 nM/g.tissue, then the death may have occurred within the first 6 h with a 75% sensitivity and 88% specificity. For MDA concentrations measured in renal tissue; if the cut-off level was selected at 12.18 nM/g.tissue, then the death may have occurred before 48 h with a 100% sensitivity and 79% specificity. Regarding SOD and GSH-Px, we were not able to reach any date that would be useful for the prediction of PMI.

CONCLUSIONS: Is the difference between brain and renal tissue MDA levels useful in predicting the PMI? In our study, we sought to determine a cut-off level with the highest diagnostic adequacy. The sensitivity and specificity percentages were calculated from the selected cut-off levels and given in the results section of our study. Our results were satisfactory and may be used as an auxiliary parameter combined with other methods to estimate the PMI. According to this study, it is possible that an estimation of the PMI can be made using a biochemical marker. To accumulate sufficient data regarding this subject, additional studies should be performed using alternative tissues, parameters and variable environmental conditions.

Oxidative stress

Cod: 1275

OXIDATIVE STRESS AND OBESITY

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BACKGROUND: Obesity is a health problem that constitutes metabolic syndrome and increases the incidence of various diseases, including diabetes, hypertension, dyslipidemia, atherosclerosis, and cancer. Various mechanisms linking obesity to these associated diseases have been postulated. One candidate is oxidative stress. The aim of our study was to assess the status of oxidative stress in healthy obese subjects compared to non-obese healthy subjects.

METHODS: Our study focused on a sample of 187 healthy volunteers in the city of Constantine, divided according to their BMI into three groups: group A (BMI <25, normal nutritional status), group B (25 ≤ BMI <30, overweight) and group C (BMI ≥ 30, obesity). A general biochemical tests was performed on the three groups (glucose, creatinine, total cholesterol, HDL cholesterol and LDL cholesterol). The status of oxidative stress was evaluated by determining the activities of erythrocyte antioxidant enzymes glutathione peroxidase (GPx) and superoxide dismutase (SOD), plasma concentrations of antioxidant vitamins E (vit E), A (vit A) and lipid peroxidation marker , the malondialdehyde (MDA). GPx and SOD were expressed in IU / g of hemoglobin (IU / gHb).The vit E was expressed as a ratio vit E /Lipids.

RESULTS: Vit E / Lipids ratio and vit A plasma concentration were significantly lower in obese subjects compared with those having normal BMI: 3.40 ± 1.16 mg / g vs 3.87 ± 1.16 mg / g; p <0.05 and 0.63 [0.46-0.76] mg / l vs 0.69 [0.57-0.86] mg / l, p <0.05 respectively. MDA plasma concentrations were significantly higher in obese versus those overweight subjects and those having normal BMI: 11.4 [7.1 to 14.6] mg / l vs 8.6 [5.9 to 11.6] g / l, p <0.01 and 11.4 [7.1 to 14.6] mg / l vs 8.4 [5.9 to 12.3] mg / l, p <0.05 respectively. Erythrocyte SOD and Gpx activities of different classes of BMI were comparable.The correlation study revealed that MDA was positively and significantly correlated with BMI (r = 0.149, p <0.05).

CONCLUSIONS: The decrease in antioxidant defenses (vit E and Vit A) and increased lipid peroxidation (MDA) in obese subjects reflect a profound oxidative stress, which would be one of the mechanisms involved in the onset of diseases caused by the obesity.

Oxidative stress

Cod: 1276

8-HYDROXY-2-DEOXYGUANOSINE CONCENTRATIONS IN MELANOCYTIC TUMORS OF THE SKIN

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BACKGROUND: Oxidative DNA damage might be involved in malignant melanocytic skin tumors development. We purposed to perform the quantitative measurement of the oxidative DNA adduct, 8-hydroxy-2-deoxyguanosine (8-OHdG), in cutaneous melanocytic lesions.

METHODS: Quantitative determination of 8-OHdG in tissue fragments requires: DNA extraction, DNA concentration and purity assessment, DNA hydrolysis in mononucleotides, samples ultrafiltration and 8-OHdG determination. Genomic DNA was isolated from: normal skin (14 samples), tumor tissues (28 samples of melanoma and 19 samples of dysplastic nevi) and melanoma adjoining tissues (16 samples). Experimental data were presented as mean values and standard deviations (SD). The relationship between variation of the two series of values was analyzed by simple linear regression. Diagnostic performance of 8-OHdG (pg/ug DNA) was appreciated using Receiver Operating Characteristic (ROC) analysis. The results were calculated for a 95% confidence interval and $p < 0.05$, using a specialized computer program. The study was approved by the Hospital Committee of Ethics. All the patients consented for the use of tissue fragments in research.

RESULTS: The skin contains low concentrations of 8-OHdG (15.6±8.3) compared with tumor tissues (98.1±29.3 pg/ug, $p < 0.005$ for dysplastic nevi, and 133.8±73.2 pg/ug, $p < 0.001$ for malignant melanoma) and tumor adjoining tissues (35.8±17.3 pg /ug, $p > 0.1$). To differentiate normal skin versus malignant melanoma, 8-OHdG concentration was 48.6 pg/ug, area under the ROC curve (AUC)=0.883 (CI=95%, 0.615-0.925), sensitivity 78%, specificity 63.6%, $p < 0.001$. To differentiate melanoma tissue versus tumor adjoining tissues, 8-OHdG concentration was 59.1 pg/ug, sensibility 69.4%, specificity 93.1%, AUC=0.507 (CI=95%, 0.432-0.683), $p > 0.05$. For melanoma and dysplastic nevi, the cut-off value of 8-OHdG was 101.6 pg/ug, sensitivity 48.7%, specificity 58.8%, AUC=0.675 (CI = 95%, 0.519-0.749), $p > 0.05$. The normal skin was compared with dysplastic nevi and the value of 8-OHdG was 34.4 pg/ug, sensitivity 66.7%, specificity 63.6%, AUC=0.798 (CI=95% 0.642-0.852), $p < 0.05$.

CONCLUSIONS: Based on these results, we can conclude that 8-OHdG could be a useful marker in assessing the malignancy potential of melanocytic lesions.

Oxidative stress

Cod: 1277

WHAT IS THE EFFECT OF OZONE THERAPY ON THE ANTIOXIDANT/OXIDANT SYSTEM?

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BACKGROUND: The Ozone Therapy (OT) is used worldwide for nearly 40 years. The most important indications for the OT are the arterial circulatory disorders, infections, diseases caused by immune deficiency, for additional treatment of patients with cancer, and rheumatic diseases. For clinical, molecular and physiological effects of the OT, free radicals must be generated. The aim of this study is to evaluate the oxidant effect of OT on biological molecules in blood and the changes in the levels of oxidant/antioxidant after OT.

METHODS: The study involved 35 volunteers, with the mean age of 42.37±13.96. Major autotherapy is applied to participants and blood samples were taken from the antecubital vein before and after the treatment. Samples taken were centrifuged and examined within 2 hours. Oxidant effect of ozone in serum was evaluated by Total Oxidant Status(TOS), Ischemia Modified Albumin(IMA) and Advanced Oxidant Product of Protein(AOPP), while antioxidant effect was evaluated by Total Antioxidant Status(TAS), Total Thiol Levels(TTL), Arylesterase(ARES), Paraoxonase(PON) and Stimulated Paraoxonase(SPON) tests. The equilibrium state of oxidative stress in serum was analysed by Oxidative Stres Index (OSI). Statistical analysis of data was performed and results were evaluated at the significance level of %5 ($p<0.05$). Pretreatment levels of Oxidant/Antioxidant molecules were compared with posttreatment levels.

RESULTS: TOS and IMA tests, related with oxidant status, showed statistically significant increase ($p=0.019$, $p=0.005$, respectively). On the other hand increase of AOPP wasn't statistically significant ($p=0.533$). Antioxidant status reflected by TAS, PON, SPON, ARES tests decreased after the treatment ($p=0.047$; 0.0001; 0.0001; 0.0001 respectively). Increase of OSI, a sign of oxidant balance, wasn't statistically significant.

CONCLUSIONS: In our study, oxidant molecules were strongly increased and antioxidants were decreased in post-treatment samples. It is believed that this is an indicator of reactive oxygen species formed by ozone. And this is necessary for ozone activity at treatment. Decreased antioxidants levels might be because of consumption of them in neutralization of oxidants.
Key words: Ozone-therapy, effect of ozone, oxidant/antioxidant molecules

Oxidative stress

Cod: 1278

ANALYZING THE CORRELATION OF SERUM IRON PARAMETERS WITH PARAOXANASE, ARYLESTERASE AND OXIDATIVE STRES MARKERS IN STEM CELL TRANSPLANTATION PATIENTS

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BACKGROUND: Hematopoietic Stem Cell Transplantation (HSCT) is increasingly used for the treatment of a variety of the malignant and nonmalignant disorders. However, HSCT is also associated with morbidity and mortality, because of impaired iron metabolism . Iron overload, in tissues and systemic circulation, is importantly thought that increase the oxidative stress.

METHODS: In patients and controls serum iron, iron binding capacity and ferritin levels were measured. Antioxidant enzymes, Catalase (CAT), Glutathione peroxidase (GPx), Paraoxonase (PON), Arylesterase (ARE), and Glutathione-s Transferase (GST) activities were measured in serum. These parameters and enzymes in relevance to MDA were evaluated. This study was done by taking serum from different disease's patients who will take allogeneic or otolog transplantation therapy and controls.

RESULTS: Serum MDA levels were found higher in autologous group. Statistically significant difference were found between autologous group and control group ($p=0.003$; $p<0.05$). Serum glutathione peroxidase and catalase activity levels were lower in the allogeneic and autologous groups, significant difference was observed between the control group and allogeneic or autologous groups ($p>0.05$). Serum paraoxonase activity levels in autologous were found low when compared with control group. Statistically significant difference were found between them ($p=0.027$; $p<0.05$). In terms of serum iron levels statistically significant difference were found between allogeneic and autologous group ($p=0.000$; $p<0.05$). Serum ferritin levels were found high in allogeneic and autologous groups than control group. Statistically significant difference were found between groups ($p=0.000$; $p<0.05$). According to Spearman's correlation analysis, between serum MDA level and serum GPx activity level negative correlation was found. Between serum MDA and serum GST, and between serum paraoxonase activity and serum arylesterase activity were found a positive correlation.

CONCLUSIONS: In treatment of the hematological diseases serum and tissues iron overload must be prevented. In addition, to protect and increase antioxidant enzymes levels. Ingesting natural foods which have antioxidant features may be necessary.

Oxidative stress

Cod: 1279

EVALUATION OF PARAOXONASE 1 ACTIVITIES OF PATIENTS INFECTED WITH GENOTYPE 1B AND GENOTYPE 4 HEPATITIS C VIRUS

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BACKGROUND: Hepatitis C virus (HCV) is an important cause of chronic liver disease and related with oxidative stress. The type of treatment given for chronic HCV depends on the genotype of virus that someone has been infected with. HCV genotype 1a, 1b, 2a, 2b, 3a are generaly the most prevelant types in most countries and also in Turkey. Genotypes 4, 5, 6 are rare. However, the prevalence of genotype 4 in Middle Anatolia in Turkey is near to genotype 1b. Prognosis and life expectancy for the chronic Hepatitis C virus (HCV) infection depends on how much the liver is damaged and how well a person responds to treatment which is associated with genotypes. Genotype 1b is known to have poor prognosis, although knowledge about genotype 4 is not sufficient. For that reason, in this study we aimed to compare antioxidant activities of HCV patients with genotype 1b to genotype 4, and the relation of paraoxonase 1 (PON1) activity with hepatic damage.

METHODS: HCV RNA level was determined by commercial real time PCR method. 49 patients with HCV genotype 1b, 47 with genotype 4 were included into the study. Serum PON1 activity was analyzed by spectrophotometric method. Serum triglycerides, total cholesterol, low density lipoprotein (LDL), high density lipoprotein (HDL) and liver histological activity index (HAI) and fibrosis scores were recorded.

RESULTS: There was no difference between serum transaminase, total cholesterol, LDL and HDL levels and HAI and fibrosis scores between two genotypes. However serum PON1 activity was lower in genotype 1b according to genotype 4 (41.52 U/L and 56.09 u/L respectively, $p<0.01$, $z=-2.5$). In genotype 1b, PON1 was correlated with fibrosis scores ($p<0.01$, $r=0.470$).

CONCLUSIONS: Antioxidant enzyme PON1 activity is lower in genotype 1b according to genotype 4, despite similar lipid profile, serum transaminase levels and fibrosis scores. This may affect response to therapy and prognosis.

Oxidative stress

Cod: 1280

OXIDANT-ANTIOXIDANT STATUS IN CHRONIC RENAL FAILURE BEFORE AND AFTER HEMODIALYSIS

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BACKGROUND: Stage V chronic kidney disease (CKD) is the syndrome of persistent renal impairment involving loss of glomeruli, tubular and nephron function. It has been proposed as a pro-oxidant state characterised by increased levels of free radicals.These pro-oxidants can cause oxidative damage to various biological molecules such as DNA,lipids and proteins and also act as an important factor in promoting pathogenesis of stage V CKD and its complications.This imbalance between oxidant-antioxidant in favour of the former is enhanced further in hemodialysis and can lead to dialysis related pathologies such as atherosclerosis, dialysis related amyloidosis, malnutrition and anemias.

METHODS: It was a case control study of 50 patients of stage V CKD divided into before and after dialysis groups compared with 50 normal age and sex matched healthy controls.

RESULTS: The results were analysed statistically and shown that the levels of MDA in cases of CKD in after dialysis group were significantly higher (p value <0.001) than in before dialysis group whose values were found to be still significantly higher (p value<.001) than normal healthy controls. The levels of SOD and Vit-C in cases of CKD in after dialysis group were significantly lower (p value <0.001) than in before dialysis group whose values were found to be significantly lower(p value<0.001) than normal healthy controls.

CONCLUSIONS: These findings might exhibit beneficial role of antioxidant supplementation for delaying the progression of CKD and various complications arising out of hemodialysis.

Oxidative stress

Cod: 1281

ANTIOXIDANT EFFECTS OF POMEGRANATE EXTRACT IN A MESENTERIC ISCHEMIA REPERFUSION MODEL

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BACKGROUND: We investigated whether pomegranate extract played an antioxidant protective role against mesenteric ischemia-reperfusion (IR) injury, which can lead to a systemic response, damaging distant organs, such as the lung, liver, and kidney.

METHODS: Forty female Wistar-Albino rats were separated into four groups: sham, control, mesenteric ischemia-reperfusion (IR), and mesenteric ischemia-reperfusion and pomegranate (IR+PG). In the control and IR+PG groups, pomegranate (225 mg/kg) was given by oral gavage at the beginning of the study. Ischemia was induced for 30 min and subsequently reperfusion was allowed for 60 min in the IR and IR+PG groups. After the procedure, malondialdehyde (MDA) and total antioxidant activity (TAS) were assayed in blood samples. Additionally, all tissues were removed for measurement of TAS, total oxidant status (TOS), and histopathological evaluation. The oxidative stress index (OSI) was calculated.

RESULTS: Histopathological changes in all organs were significantly higher in the IR group, and significantly lower in the IR+PG group versus the other groups. Serum MDA levels were significantly lower in the IR+PG group than in the IR group. No significant difference was found in TAS activity in any group. In this study, unlike previous reports, TAS levels were lower in the IR+PG group compared with the IR group. TAS levels increase in response to oxidative stress. If the oxidative effect was reduced, TAS levels would be expected to be lower than in the IR+PG group. In contrast, with oral consumption of pomegranate, bioavailability in small animals is poor, and ellagitannins, which have an antioxidant effect, are connected to cellular DNA and proteins—this limits the oral absorption of pomegranate.

CONCLUSIONS: Consumption of pomegranate extract ameliorated the oxidative stress effect, particularly in terms of degenerative histopathological changes in tissues damaged by ischemia-reperfusion injury. Pomegranate also exerted beneficial effects in terms of preventing distant organ damage after ischemia-reperfusion injury. These data may explain the positive protective effects of pomegranate in ischemic conditions seen in an intestinal ischemic reperfusion injury model .

Oxidative stress

Cod: 1282

SERUM MALONDIALDEHYDE LEVELS AND SUPEROXIDE DISMUTASE ACTIVITIES IN PATIENTS WITH GASTRIC CANCER

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BACKGROUND: Gastric cancer mortality has declined markedly around the world. An increasing amount of epidemiological and experimental evidence has been carried out on the relationship between free radicaly activity and malignancy. The aim of this study was to determine of serum malondialdehyde (MDA) levels and superoxide dismutase (SOD) activities and the correlation of these parameters in patients with gastric cancer.

METHODS: The levels of serum MDA and SOD activities were assessed in 44 patients with gastric cancer and 20 control subjects. Serum MDA and SOD activities levels were measured using a specific enzyme-linked immunosorbent assay.

RESULTS: Serum MDA levels in patients with gastric cancer (2.27±1.83) were not significantly higher than the control group (2.89±0.61) (p:0.051). Serum SOD activities in patients with gastric cancer (4.39±2.25) were not significantly higher than the control group (4.76± 1.54) (p=0.0509). There was no correlation between serum MDA levels and SOD activities (p:0.126 r: 0.195).

CONCLUSIONS: The results of the present study demonstrated that serum malondialdehyde and superoxide dismutase levels are not a useful parameters for evaluate patients with gastric cancers.
Keywords: Gastric Cancer; MDA; SOD

Oxidative stress

Cod: 1283

A BENEFICIAL EFFECT OF NONTOXIC OZONE ON H2O2-INDUCED STRESS AND INFLAMMATION

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BACKGROUND: Chronic obstructive pulmonary disease (COPD) has become a major health problem that is mainly caused by cigarette smoke, chemicals and pollution. It has been demonstrated by the clinic studies that preconditioning with ozone/oxygen (OOP) has anti-inflammatory and anti-oxidant properties in several visceral organs.

METHODS: In the present study, OOP has been tested whether it has anti-oxidant and anti-inflammatory effects on hydrogen peroxide (H_2O_2) induced oxidative stress in A549 lung alveolar epithelial cells. The cells ($50x10^3$) were pretreated with ozone 90 min before H_2O_2 exposure for 24 h period. The viability of the cells was assessed by MTT test and mRNA expressions of selected cytokines were determined by quantitative real time PCR.

RESULTS: The dose response study has shown that 20 μM of ozone treatment could increase cell number by 4.7% ($p < 0.01$), whereas 100 μM H_2O_2 exposure loss 19% of the cell number ($p < 0.01$). Pretreatment of ozone could rescue 11% of the cell loss induced by H_2O_2. H_2O_2 exposure decreased the mRNA expressions of glutathione peroxidase, superoxide dismutase and catalase by 2.9, 0.3 and 5.3 folds, respectively ($p< 0.05$). Similarly, the exposure depleted mRNA expressions of tumor necrosis factor alpha (TNF-α) and inducible nitric oxide (iNOS) by 2.4 and 1.4 folds, respectively ($p< 0.05$). However, ozone pretreatment gained H_2O_2-depleted antioxidant enzyme expressions by 5.1, 4.1 and 7.0 folds, respectively, and 3.6 and 7.9 folds of TNF-α and iNOS, respectively ($p< 0.05$).

CONCLUSIONS: It has been concluded that nontoxic concentrations of ozone could have anti-oxidant and anti-inflammatory properties in alveolar epithelial cells.
Keywords: COPD, oxidative stress, inflammation, ozone

Oxidative stress

Cod: 1284

N-ACETYL-L-CYSTEINE (NAC) DECREASES BLEOMYCIN INDUCED MITOCHONDRIAL DAMAGE AND APOPTOSIS IN MALIGNANT TESTICULAR TUMOR CELL

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BACKGROUND: Bleomycin is used commonly in the treatment of testicular cancer. Bleomycin causes an increase of reactive oxygen species (ROS) resulting in oxidative stres, mitochondrial damage and induces apoptosis in cancer cells. Therefore, one might suspect that antioxidants may inhibit ROS and prevent apoptosis of cancer cells. There is an intense argument on the concurrent use of antioxidants with the conventional cancer treatments. N-Acetyl-L-Cysteine (NAC) is a compound known to have powerful antioxidant properties. Due to the property, in our study we examined the effects of NAC on oxidative stress created by Bleomycin. The aim of our study was to clarify the molecular mechanism of apoptosis which induced by Bleomycin and the effect of NAC on mitochondria and apoptosis in human testicular cancer cell line. We have choosen the wild-type p53 expressing cell line, NTera-2 (NT2).

METHODS: We determined the cytotoxic effect of bleomycin on NT2 cells and measured apoptosis markers such as Caspase-3, -8, -9 activities and Bcl-2, Bax, Cyt-c, Annexin V-FTIC and PI levels in NT2 cells incubated with different agents for 24 h. Early apoptosis was determined using an FITC Annexin-V Apoptosis Detection Kit by using flow cytometry.

RESULTS: We found half of the lethal dose (LD50) of Bleomycin on NT2 cell viability as 400, 100, and 20 μg/ml after incubations for 24, 48, and 72 h, respectively. Incubation with bleomycin (LD50) and H_2O_2 for 24 h increased Caspase-3, -8, -9 activities, Cyt-c and Bax levels and decreased Bcl-2 levels. The concurrent incubation of NT2 cells with bleomycin/H_2O_2 and NAC (5mM) for 24 h abolished bleomycin/H_2O_2-dependent increases in Caspase-3, -8, -9 activities, Bax and Cyt-c levels and bleomycin/H_2O_2-dependent decrease in Bcl-2 level. Our results indicate that bleomycin/H_2O_2 induce apoptosis in NT2 cells by activating mitochondrial pathway of apoptosis, while NAC diminishes bleomycin/H_2O_2 induced apoptosis.

CONCLUSIONS: Our results indicated that Bleomycin mediated mitochondrial damage and apoptosis was suppressed by NAC in NT 2 cells. Finally, because of antioxidants prevent ROS, we believe that the use of antioxidants during treatment with Bleomycin negatively affect the treatment process.

Oxidative stress

Cod: 1285

IMPAIRED HOMOCYSTEINE AND GLUTATHIONE PATHWAYS IN FIRST EPISODE SCHIZOPRENIA

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BACKGROUND: Evidence increasingly points to the involvement of oxidative stress in schizophrenia pathophysiology. Also, extensive studies have revealed that increased serum ho¬mocysteine is a risk factor of cardiovascular diseases, cerebral hemorrhage, and vascular dementia; of neuropsychiatric diseases, includ¬ing the schizophrenia. The human body has a complex antioxidant defense system that includes the antioxidant enzymes. Also more important are the non-enzymatic antioxidants such as glutathione (GSH).

METHODS: Sixty-two (62) patients (mean age = 33.7 ± 8.2 years) with schizophrenia and 57 normal subjects (mean age =33.7 ± 8.6 years) participated in this study. The purposes of the present study were to assess whether homocysteine(Hcy) ,methionine ,folate, vitamin B12 and GSH levels were altered in the drug-naive first episode schizophrenia patients as compared to control subjects, if so, to further test whether altered antioxidant defenses were associated with clinical characteristics of patients. Homocysteine and methionine levels were measured by using LC/MS technique. The levels of glutathione, vitamin B12 and folate were determined by using commercially available assay kits with an auto analyzer.

RESULTS: Serum homocysteine and methionine levels were significantly increased, while glutathione and vitamin B12 levels were significantly decreased, with the first episode schizophrenic patients. Statistical analysis showed negative correlation between PON1, ARE activities and BNP; whereas positive correlation between NYHA classes, UA and BNP. Not surprisingly, a positive correlation was determined between TAS and UA.

CONCLUSIONS: To the best of our knowledge, the present study is the first to demonstrate a notable dissimilarity between pathways involved in homocysteine and glutathione for first episode schizophrenia patients. These prominent results provide further support for a role for impaired dispersion of oxidative pathways. These markers may provide extra support in evaluating these patients at the first place and during clinical follow-up.

Oxidative stress

Cod: 1286

ACTIVITIES OF XANTHINE OXIDASE AND XANTHINE DEHYDROGENASE IN PATIENTS WITH DIABETIC NEUROPATHY

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BACKGROUND: Oxidative stress is an important pathogenic constituent in diabetic endothelial dysfunction and could potentially contribute to diabetic neuropathy and vasculopathy. The aim of this study was to assess the involvement of elevated xanthine oxidase activity in diabetic neuropathy.

METHODS: This study involved 38 patients with type 2 diabetes mellitus and signs of diabetic polyneuropathy (DP), as well as the control group of 35 healthy subjects. The evaluation of diabetic polyneuropathy was based on physical examination and nerve conduction studies. Laboratory analyses involved blood glucose and HbA_{1c} levels, as well as plasma xanthine oxidase (XO) activity and xanthine dehydrogenase (XD) activity.

RESULTS: Serum glucose and HbA_{1c} levels were significantly higher in DP patients versus the control group ($p<0.001$). The activity of XO revealed a significant increase in the plasma of patient with diabetic polineuropathy ($p<0.001$), but significant decrease in XD activity was identified in those patients ($p<0.001$). A significant positive correlation was noticed between the activity of XO and HbA_{1c} levels ($p<0.01$). There was significant negative correlation between the XD and HbA_{1c} ($p<0.01$).

CONCLUSIONS: Hence, the results of this study strongly suggest that superoxide should be generated through the increased XO seen in the diabetic patients, which may be involved in the pathogenesis of complications of diabetic polyneuropathy.

Oxidative stress

Cod: 1287

SERUM SIALIC ACID AND OXIDATIVE STRESS LEVELS IN DM PATIENTS DIAGNOSED WITH HBA1C

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BACKGROUND: Haemoglobin A1c (HbA1c) was used for quantifying the risk of complications in patients with diabetes and for monitoring glycaemia. Recently, HbA1c can be used for the diagnosis of Diabetes Mellitus. Cardiovascular disease is a common cause of death for diabetic patients. High sialic acid levels (SA) and increased oxidative stress are important factors for cardiovascular diseases. We aimed to research whether SA, thiobarbituric acid reactive substances (TBARS) and thiol levels (SH) levels are associated with the degree of the diabetic regulation and investigate if SA and oxidative stress can be controlled with the regulation of the HbA1c levels.

METHODS: A total of 100 subjects were included in the study. Three groups were constituted according to HbA1c test results: normal (<%5.7, n=30), prediabetic (%5.7-6.4, n=30), and diabetic (≥6.5, n=40). Glycated hemoglobin (HbA1C), SA, TBARS and SH were measured in the sera of the patients.

RESULTS: SA and TBARS levels were significantly increased in subjects with type 2 DM (P<0.05 for both). SH levels were significantly decreased in subjects with type 2 DM (P<0.05 for both). Diabetic patients were found to have higher risk for inflammation and oxidative stress.

CONCLUSIONS: Sialic acid (SA) is a component of glycolipid and glycoproteins found in hormone and enzymes in serum and tissues and high serum SA levels are observed in diabetic patients. The regulation of HbA1c levels may contribute to the decline of both SA and TBARS levels.
Key Words: Serum sialic acid levels, oxidative stress, Diabetes mellitus

Oxidative stress

Cod: 1288

THE PROTECTIVE EFFECT OF MELATONIN ON HIGH DOSE METHYLPREDNISOLONE DAMAGED RABBIT HEART TISSUE

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BACKGROUND: Glucocorticoids have been used in the treatment of a number of disease due to their widely therapeutic effects. But they have serious side effects. In this study we aimed to investigate the effect of a single high dose steroid on the oxidant- antioxidant system of heart tissue and probably protective effects of melatonin that known antioxidant effects.

METHODS: 20 rabbits were separated into three groups. Group I: Control group (n=5), group II: Methylprednisolone group (n=7, 20 mg/kg/intramuscular), Group III: Methylprednisolone and melatonin group (n= 8, 20 mg/kg/im and 20 mg/kg/ intraperitoneal, respectively). Levels of malondialdehit (MDA) a lipid peroxidation product, protein carbonyl (PC) a protein oxidation product and nitric oxide (NO) levels were measured from heart tissue samples all the rabbits included in the study. Also antioxidant enzymes superoxide dismutase (SOD), glutathione peroxidase (GSH-Px) and catalase levels were measured from heart tissues.

RESULTS: The results of the study showed that; MDA levels insignificantly increased in only methylprednisolone group and insignificantly decreased in melatonin group, PC levels significantly decreased in both methylprednisolone and melatoninin groups (p=0.031) compared to control group. NO levels didn't changed in only methylprednisolone group but insignificantly decreased in melatonin group. Methylprednisolone and melatonin had no effect on SOD enzyme levels in rabbit heart tissue. Both methylprednisolone and melatonin insignificantly increased GSH-Px and catalase levels compared to control group.

CONCLUSIONS: According to the results of this study we can say that methylprednisolone have oxidant effects on lipids and antioxidant effects on proteins in study doses and melatonin has antioxidant effects. We believe that further animal and human studies are necessary to determine the effect of different doses of methylprednisolone as an oxidant and antioxidant agent.

Oxidative stress

Cod: 1289

ANTI-OXIDANT/OXIDANT STATUS IN TUNISIAN RHEUMATOID ARTHRITIS PATIENTS

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BACKGROUND: Rheumatoid arthritis (RA) is a chronic multisystem disease with an unknown etiology. Recent findings indicate that increased oxidative stress and/or defective antioxidant status contribute to the etiology of RA. The study was undertaken to examine the oxidant and antioxidant. The aim of the present study was to assess the antioxidant enzyme activities and the total antioxidant status (TAS), lipid peroxidation (thiobarbituric acid-reactive substances (TBARs)) and homocysteine (hcy) levels in patients with rheumatoid arthritis (RA).

METHODS: The study population contained 172 patients with RA and 147 healthy controls. The glutathione peroxidase (GPx) and the glutathione reductase (GR) erythrocyte activities were determined at 340 nm (Randox Kit). Catalase (CAT) activity was performed by colorimetric assay (Goth). The superoxide dismutase (SOD) activity and TAS levels were assayed by colorimetric methods at 505 nm and 600 nm respectively (Randox Kit). Plasma TBARs was determined by the spectrofluorometric method of Yagi. Serum hcy was measured by fluorescence polarization immunoassay (Abbott, AxSYM).

RESULTS: TAS was significantly lower in patients than in controls (1.68±0.29 mmol/l vs 1.75±0.22 mmol/l, p=0.034). No difference in SOD activity between patients and healthy subjects (1740±600 U/gHb vs 1718±604 U/gHb, p=0.76). Statistically significant decrease in CAT, GPx and GR activities (240.93±118 kU/gHb vs 288.5±99.7 kU/gHb, $p<10^{-3}$; 133.45±47.25 U/gHb vs 153.83±31.5 U/gHb, $p=10^{-3}$; 8.06±3.2 U/gHb vs 8.95±3.26 U/gHb, p= 0.032, respectively). TBARs and hcy levels were significantly higher in patients than in healthy subjects (1.533±0.849 µmol/l vs 0.658±0.350 µmol/l, $p<10^{-3}$; 13.74±7.03 µmol/l vs 10.46±3.64 µmol/l, $p<10^{-3}$, respectively).

CONCLUSIONS: Decreased antioxidant system and increased oxidative stress (TBARs and hcy) in RA patients confirm the implication of oxidative stress in RA and the role of hcy as pro-oxidant factor.

Oxidative stress

Cod: 1290

THE EFFECT OF MONTELUKAST ON EXPERIMENTAL OBSTRUCTIVE JAUNDICE

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BACKGROUND: Montelukast is a cysteinyl-leukotrien type 1 (CysLT1) selective receptor antagonist. In the last years, investigations have been showed that montelukast possesses secondary anti-inflammatory activities and also antioxidant effects. For this reason, we aimed to determine the possible effects of montelukast on oxidative stress of liver tissue in experimental obstructive jaundice.

METHODS: Thirty Wistar-Albino male rats were randomized and divided into 3 groups each including 10 animals: group I, sham-operated; group II, ligation and division of the common bile duct (BDL) followed by daily intraperitoneal injection of 1 mL of saline; group III, BDL followed by daily intraperitoneal injection of 10 mg/kg montelukast that was dissolved in saline. Animals were killed on postoperative day 7 by high dose diethyl ether inhalation. Blood and liver samples were taken for examination. We evaluated oxidative stress parameters of liver (MDA, MPO, and total-SH) and plasma MDA and total-SH levels.

RESULTS: In the present study, liver MDA (p=0.001), MPO (p=0.003) and total-SH (p=0.009) were found to be significantly different between the BDL+montelukast and the BDL groups. Plasma total-SH (p=0.002) and MDA (p=0.027) values were also statistically different between these groups.

CONCLUSIONS: According to our results, montelukast showed a significant hepatoprotective effect in this experimental obstructive jaundice model. This effect might be due to its antioxidant and anti-inflammatory activities.
Keywords: Montelukast, obstructive jaundice, oxidative stress

Oxidative stress

Cod: 1291

TOTAL ANTIOXIDANTS STATUS, SELENIUM LEVEL AND CATALASE AND GLUTATHIONE PEROXIDASE ACTIVITIES IN RABBITS FED A HIGH- GARLIC DIET

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BACKGROUND: Results from previous studies on the effects of intake of garlic on the body antioxidant system appear inconclusive. This study measured Glutathione Peroxidase (GSHPx) and Catalase activities, Total Antioxidant Status (TAS) and Selenium (Se) level in rabbits fed a high-garlic diet.

METHODS: Ten rabbits randomly assigned into two groups (group 1=test and group 2= control) of five rabbits each were used for the experiment. The diet of group 1 was mixed with raw garlic homogenate (1.75g/Kg body weight/ day) for 4weeks. Garlic was not added to the diet of group 2. At the beginning of the experiment (baseline) and after (4weeks), 5ml of blood sample (baseline) collected from each rabbit in both groups were analyzed for blood GSHPx and serum Catalase activities and TAS by spectrophotometric methods. Selenium was determined using Atomic Absorption Spectrophotometry (AAS).

RESULTS: At baseline, means of the parameters measured did not differ significantly between groups 1 and 2. At the 4th week, means of TAS (1741.20±381.53 µmolTrolox equiv/L), Se (47.20±12.22 µg/dl), Catalase activity (273.20±68.05 U/L) and GSHPx activity (12392.00±3068.34 U/L) in the test group were significantly higher than means of the corresponding control group (820.20±91.94 µmolTrolox equiv/L, 20.80±1.92 µg/dl, 145.40±13.35 U/L, 8528.00±1757.59 U/L respectively). There were positive associations between Catalase and GSHPx ($r = 0.65$, $p<0.01$) activities, Catalase and TAS ($r = 0.77$, $p<0.01$), GSHPx and TAS ($r = 0.66$, $p<0.01$) and Se and TAS ($r = 0.70$, $p<0.01$).

CONCLUSIONS: Results from this present study suggest that significant increases observed in the activities of antioxidant enzymes, Se level and TAS could possibly be associated with consumption of high garlic diet by the rabbits.

Oxidative stress

Cod: 1292

THE EFFECT OF VIDEOTHORACOSCOPIC SURGERY ON OXIDATIVE AND NITROSATIVE STRESS

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BACKGROUND: We aimed to evaluate whether videothoracoscopic sympathectomy cause oxidative and nitrosative stresses by means of ischemic modified albumin serum (IMA), malondialdehyde (MDA) and nitric oxide (NO) levels.

METHODS: The study was performed on 32 patients who underwent thoracoscopic sympathectomy. Venous blood samples were obtained from the participants in preoperative and postoperative (24 hours after surgery) periods. Serum IMA, MDA, NO and albumin levels were measured by colorimetric methods.

RESULTS: IMA, adjusted IMA and MDA levels were significantly increased postoperatively compared to the preoperative levels while NO levels were significantly decreased (p=0,003, 0,027, 0,004, 0,002 respectively). However there was no significant difference for albumin levels between preoperative and postoperative measurements.

CONCLUSIONS: It can be suggested that oxidative stress occurs during thoracoscopic surgery due to increased IMA and MDA levels. However, independent of thoracoscopic surgery, sympathectomy caused inhibition of NO production.

Oxidative stress

Cod: 1293

EFFECT OF OLEUROPEIN ON SERUM PARAOXONASE-1 ACTIVITY OF FRUCTOSE-FED RATS

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BACKGROUND: Metabolic syndrome (MS) is a disease characterized by hypertension, glucose intolerance, dyslipidemia, hyperinsulinemia, insulin resistance and is associated with increased risk for development of cardiovascular diseases, type 2 diabetes and obesity. Oleuropein is an olive oil phenolic compound which has anti-inflammatory and anti-oxidative properties. In this study, we aimed to investigate the effects of oleuropein administration on serum Paraoxonase-1 (PON-1) activity in fructose-fed rats.

METHODS: For this purpose, 32 male adult (8 week aged) sprague-dawley rats were randomly divided into four groups (n=8); control, metabolic syndrome, oleuropein and metabolic syndrome plus oleuropein. Metabolic syndrome was induced by fructose solution 20% in tap water and oleuropein was administered at the dose of 10mg/kg daily by oral gavage. Systolic blood pressures (SBP) were measured by tail-cuff method. Body weights were recorded weekly and fluid intake of all groups were measured daily. After the experimental period of 8 weeks, serum lipids, glucose, insülin levels were measured to support the metabolic sydrome. And serum PON-1 activity were measured.

RESULTS: In comparison with control group, fructose administration caused significantly increased water consuption and body weight, SBP, serum tryglicerides, total cholesterol, VLDL-cholesterol, LDL-cholesterol, uric acid, glucose, insulin and insulin resistance. Moreover, decrease of the serum PON-1 activity was observed following fructose treatment. Oleuropein administration prevented the increase in serum lipids, insulin resistance and decrease PON-1 activity induced by high-fructose diet. PON-1 is known as a potentially antiatherogenic HDL-associated enzyme that protects LDL from oxidative modification. However, oleuropein administration showed possitive effects on serum lipid profile and PON-1 activity in metabolic sydrome.

CONCLUSIONS: These results indicate that high-fructose consumption leads to atherogenic lipid profile, decreased serum PON-1 activity and oleuropein treatment has beneficial effects on these parameters in rats. Thus, we can suggest that oleuropein administration may be benefial effects on cardiovascular risk factors in methabolic sydrome.
Keywords: Metabolic syndrome, Oleuropein, PON-1 activity

Oxidative stress

Cod: 1294

EFFECT OF MODIFIED FUJITA TECHNIQUE UVULOPALATOPLASTY ON ADMA, NITRIC OXIDE LEVELS AND ENOS ACTIVITES IN PATIENTS WITH OBSTRUCTIVE SLEEP APNEA SYNDROME

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BACKGROUND: Obstructive sleep apnea syndrome (OSAS) is the most common type of sleep apnea. It is characterized wiht cutting off breathing for 20-40 seconds during sleeping. Uvulopalatopharyngoplasty (UPPP) is a surgical approach in treatment of OSAS. Nitric oxside (NO) causes of oxidative stress as well as be a vasodilator and is systezied from arginin by nitric oxide sentase (NOS). Asimetricdimethylarginine (ADMA) is inhibitor of endotelialy nitric oxide sentase (eNOS). We aimed to investigate levels of ADMA, NO and activite of eNOS in OSAS patient applied UPPP with modified Fujita.

METHODS: 30 patient with OSAS (Group 1: pre-treatment and Group 2: post-treatment) constituted the study group, and 30 age- and sexmatched healthy volunter made up the Control Group. Levels of ADMA were performed by HPLC, and NO (nitrite + nitrate) was determined by spectrophotometric assay using Griess reagent. Determanition of eNOS activity was measurement with ELİSA kit.

RESULTS: There was no significant diferent between levels of serum ADMA Group 1 and Group 2 (1.75±0.79, 1.87±0.5µmol/L, respectively $p>0.05$). ADMA levels of Control group (0.34±0.24µmol/L) was found significant lower from the other two groups ($p<0,05$) . eNOS activity of Control Group (172.69±53.63 IU/L) was found significant higher than the other two groups (159.61±34,27 153.26±54.06 IU/L, respectively, $p<0.001$). Levels of NO in Group 1 (22.9±3.07 µM) were found significant decrease than Group 2 (29.56±15.44 µM, $p<0.05$). Levels of NO in control group (35.59±14.2 µM) were significant increase than Group 1 and Group 2 ($p<0.05$).

CONCLUSIONS: As a result, because of high ADMA levels and low NO levels in Grup 1, we can say that patients with OSAS may be at risk of cardiovascular. Modified Fujita Technique Uvulopalatoplasty was't found effect on levels of ADMA and NO, eNOS activity.

Oxidative stress

Cod: 1295

THE RELATIONSHIP BETWEEN SMOKING AND SERUM BRAIN-DERIVED NEUROTROPHIC FACTOR LEVELS AND OXIDANT-ANTIOXIDANT SYSTEM

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BACKGROUND: The objective of this study was to examine the oxidant-antioxidant status and serum brain-derived neurotrophic factor (BDNF) levels of healthy smoker and non-smoker individuals between the ages of 18-50.

METHODS: The subjects were selected from among volunteers between the ages of 18-50 who did not have chronic drug use or acute infection, psychiatric, neurologic or chronic diseases such as chronic artery disease, diabetes mellitus, renal failure, Chronic obstructive pulmonary disease etc. Blood samples were taken from a total of 240 people from 2 groups of 120 people consisting of 60 smoking females and 60 smoking males along with 78 non-smoking females and 42 non-smoking males. BDNF, nitric oxide (NO), superoxide dismutases (SOD), malondialdehyde (MDA) and glutathione (GSH) levels were analyzed from their blood samples.

RESULTS: The plasma MDA levels ($p<0.000$) and erythrocyte SOD activity ($p<0.000$) of the smoking group was determined to be at a statistically significant higher level in comparison with the non-smoking group. Whereas the serum NO ($p<0.05$) and BDNF levels ($p<0.05$) were determined to be lower at a statistically significant level for the smoking group in comparison with the non-smoking group. There was no significant difference in GSH activities between smoking and non-smoking groups.

CONCLUSIONS: Study results indicate that smoking shows its damaging effects on neurons as well by both disrupting the oxidant-antioxidant balance and decreasing BDNF which is known to have a neuro-protective effect.

Oxidative stress

Cod: 1296

EFFECTS OF LEPTIN, GHRELIN AND NPY ON SERUM CYTOKINE LEVELS AND OXIDATIVE STRESS IN EXPERIMENTAL GENERALIZED CONVULSIVE EPILEPSY MODELS

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BACKGROUND: Leptin (Lep), Ghrelin (Ghr) and NeuropeptideY (NPY) have an important role in the pathogenesis of epileptic seizure besides physiologic functions such as reproduction, food intake, circadian rhythm, pain, memory functions and reward mechanism. In this study; in convulsive seizure model Lep, Ghr and NPY which are endogen peptides; we evaluated their roles on cytokines as a result of systemic immune response effects apart of its effects on the development of seizures, their peripheral antioxidant effects and their role in combating oxidative stress.

METHODS: Wistar rats are divided into 5 groups; Group1 (SF+SF), Group2 (SF+PTZ), Group3 (Lep+PTZ), Group4 (Ghr +PTZ), and Group5 (NPY+PTZ) were administered intra peritoneal Lep, Ghr and NPY 30 minutes before PTZ (penthylenetetrazole) was given. At the end of the experiments, blood samples were obtained from all groups and serum cytokines (TNFα, IL1β, IL6), NO (nitric oxide), MDA (malondialdehyde), GSH (glutathione) levels were measured.

RESULTS: It was found that Lep, Ghr and NPY delayed the initiation of seizure, delayed the initiation of minimal seizure and significantly suppressed seizure activity by creating a significant reduction in seizure severity than Group2. In PTZ administered Group2, cytokines levels after tonic-clonic seizure activity were found higher than only in Group1. In groups given endogen peptides; cytokines levels were found to be decreased more than in Group1. In the groups that received endogen peptides, decrease in MDA levels was detected more than in the control group.

CONCLUSIONS: According to our results; endogen peptides were found as anti-convulsants in generalized tonic clonic convulsive seizure models we created by administering a single dose PTZ. In convulsive seizure model, the decrease that endogen peptides created on TNFα, IL1β, IL6 levels which are pro-inflammatory cytokines suggest that these peptides might be anti-inflammatory during epileptic seizures. Since each of all these endogen peptides lead to decrease in serum MDA levels and increase in GSH levels, it is suggested that they might be protective against oxidative stress damage which is involved in the pathogenesis of epilepsy.
Key words: Epilepsy, convulsive seizure, leptin, ghrelin, NeuropeptideY, TNFα, IL1β, IL6, nitric oxide, malondialdehyde, glutathione

Oxidative stress

Cod: 1297

THE EFFECTS OF CYCLOSPORINE-A ON OXIDATIVE AND ANTI-OXIDATIVE STATUS AND THE PROTECTIVE ROLE OF ERDOSTEIN IN RAT TESTIS

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BACKGROUND: In the present study, the effect of Cyclosporine-A (Cyclo) on oxidative-antioxidative status and the protective effect of erdostein against Cyclo-induced injury in rat testis was investigated with histological and biochemical methods.

METHODS: In our experiment 32 Wistar albino male rats were used. The rats were randomly divided into four groups; Control group, Cyclosporine group (20 mg/kg/day i.p.), Cyclosporine+Erdosteine group (Erdosteine 12 mg/kg/day orally) and only Erdosteine (Erdo) group. At the end of 10th day, the animals were anesthetized with ketamin/ksilazin and testis tissues were removed and divided two parts for histological and biochemical analysis.

RESULTS: According to our biochemical results MDA, product of lipid damage, significantly increased in Cyclo group compared to Control and Erdo groups. However, MDA levels significantly decreased in Erdo and Cyclo+Erdo groups compared to Cyclo group ($p < 0,05$). NO (nitrite/nitrate) levels were significantly higher in Cyclo and Cyclo+Erdo groups than Control and Erdo groups. However, NO levels significantly decreased in Cyclo+Erdo group compared to Cyclo group ($p < 0,05$). CAT activities in Erdo group were significantly higher than Cyclo and the Cyclo+Erdo groups, while these activities in Cyclo group were significantly lower than Erdo and Cyclo+Erdo groups ($p<0,05$). There were no statistically significant difference among all groups in SOD and GSH-Px activities.

CONCLUSIONS: According to our histopathological results; the tissue of Cyclo group showed some histopatological changes such as sinuzoidal dilatation, vacuolization in the hepatocytes, inflammatuar cell infiltration and hemorrhage. In the Cyclosporine plus Erdostein group, histopatological changes of hepatic damage markedly reduced. Histological investigations were consistent with statistical results.
In conclusion these findings support that Erdosteine decrased cyclosporine induced testis injury.
Key words: Testis; Oxidative Status; Cyclosporine; Erdostein, Rat

Oxidative stress

Cod: 1298

PON1 ACTIVITY AND AOPP LEVELS IN PATIENTS WITH DM TYPE2

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BACKGROUND: Paraoxonase (PON1) is a calcium-dependent esterase closely associated with the highdensity lipoprotein (HDL) subfraction that contains apolipoprotein AI in human serum. Latest studies shown that HDL can prevent LDL oxidation. Low PON1 has been shown in oxidative stress-associated processes such as dyslipidemia, diabetes mellitus, advancing age, and smoking. Therefore, We studied the correlations between PON1 and one of biochemical markers of the oxidation system AOPP.

METHODS: The study group consisted of a total of 123 subjects, which included non-diabetic healthy control subjects (n =30) and type 2 DM patients (n = 93). The healthy controls were not on any kind of prescribed medication or dietary restrictions. We measured PON1 activity and AOPP levels in spectrophotometer. PON1 was estimated spectrophotometrically using phenyl acetate as substrate. Determination of AOPP (i.e. some oxidation products with characteristic absorbance) was based on spectrophotometric detection according to Witko-Sarsat et al. (1996). The results were expressed as mean±standard deviation (SD). $p<0.05$ was considered to be statistically significant. Statistical analysis was performed by using the SPSS-16. Mann whitney U and Student t tests was performed for comperation. Pearson's correlation was applied to correlate between the parameters.

RESULTS: PON1 activity is significantly lower (p=0,042) and AOPP concentrations is significantly higher(p=0,000) in patients with DM. We found a positive corelation between PON1 and HDL (r=0,36). Between AOPP and fasting glucose, HbA1c, cholesterol a positive correlation also was observed (r=0,324, r=0,376, r=0,27). Between AOPP and PON1 a negative correlation was observed.

CONCLUSIONS: Type 2 diabetes mellitus (DM) is a common disease affecting people in the world and its incidence is increasing rapidly. There were significant differences in PON1 and AOPP levels between the patient group and the control group. Low PON1 activity shows oxidative damage in DM. There is evidence of a possible association between AOPP and decreased PON1 activity in DM. The increase in protein oxidation parameters in the GDM group leading to decreased PON1 activity might, we think, create a predisposition for clinical complications in DM group.

Oxidative stress

Cod: 1299

CORRELATION OF BIOMARKERS OF OXIDATIVE STRESS AND LIFESTYLE CHANGES IN A STUDENT POPULATION

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BACKGROUND: The aim of this study was to gain an insight into their health, nutrition habits and general lifestyle with a comprehensive analysis of the student health conducting the survey, specific measurements, and laboratory analyses of antioxidative enzymes and to established novel targets for the cardiovascular prevention.

METHODS: In this study were included 510 students from the University of Novi Sad, both sexes (199 men and 311 women), mean age of 22.25 ± 2.07 years. According to the body-mass index (BMI) lower and higher than 25 kg/m^2 and waist circumference (WC) lower and higher than 94 cm (80 cm for females) the selected group of 238 students was divided into 2 subgroups: the control group of 74 students and the risk group of 164 students and the laboratory examinations of the antioxidant protection were performed.

RESULTS: The activities of the antioxidant enzymes were significantly lower among students in the high risk group compared with the control group. Activity of two important enzymes, superoxide dismutase (SOD-1) and glutatione reductase (GR) are even lower of reference values in risk group. In relationship to lifestyle changes and promotions of health way of life, the results showed significantly positive correlation between physical activity and glutatione peroxidase (GSH-Px) and total antioxidative status (TAS) ($p< 0.05$) and negative correlation for smoking and activity of GR, SOD-1, GSH-Px and TAS ($p< 0.01$). Activity of TAS and SOD showed significantly positive correlation of nutritive status as weekly consumation of fish and drinking red wine ($p<0,05$) and as well as suplementation of omega -3-fatty acids in the risk student population.

CONCLUSIONS: The obtained correlations indicate that among activities of antioxidant enzymes and lifestyle changes, exist a mutual connection which are reliable risk predictors for noncommunicable diseases compared to the other investigated parameters from the Survey list in the risk student population. These data can provide a good basis for taking the primordial and primary prevention measures through the change and promotion of a healthy lifestyle ("eat less and exercise more") and the modifications of the risk factors for cardiovascular diseases.

Oxidative stress

Cod: 1300

THE EFFECTS OF ULTRASOUND HOMOGENISATION ON THE ACTIVITIES OF SUPEROXIDE DISMUTASE, GLUTATHIONE PEROXIDASE, CATALASE AND LEVELS OF LIPID PEROXIDE IN LIVER HOMOGENATES

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BACKGROUND: In this study, effects of ultrasound homogenisation (Sonication) technique on the activities of superoxide dismutase, glutathione peroxidase, catalase, levels of lipid peroxidation and total protein in liver homogenates were investigated.

METHODS: Postmortem healthy fresh calf liver was used as the material. Liver was sliced and grouped (0,5 g for each, n=12) as mechanical homogenisation group (2 min with Sartorius 37070, Germany) and sonication group (2, 4, 6, 8 and 10 second sonication with SONIC vibra cells, Amplutide probe S&M 0702 40% of maximum, USA). Activities of SOD, GPx, CAT and levels of LPO and total protein were measured in supernatant of homogenisated samples by spectrophotometric methods.

RESULTS: Superoxide dismutase, glutathione peroxidase, catalase activities, lipid peroxidation and total protein levels in mechanical group was 122.99 ± 14.98 U/g protein, 249.59 ± 25.21 mU/g protein, 434.27 ± 25.84 U/mg protein, 0.21 ± 0.04 nmol/mg protein, 196.20 ± 7.48 mg/g liver, respectively. These results were significantly different from sonication groups ($p<0.05$). In sonication groups, superoxide dismutase and glutathione peroxidase activities were higher and catalase activity was lower from mechanical group ($p<0.05$). As regards glutathione peroxidase activity, 8 sec sonication group was the lowest level compared to 2, 4, 6 ($p>0.05$) and 10 sec ($p<0.05$) groups whereas 8 sec catalase activity was the highest level compared to other sonication groups ($p<0.05$). Total protein level was the lowest in 8 sec group compared to the other sonication groups which significant difference was determined in 2, 6 and 10 sec ($p<0.05$) groups. Lipid peroxidation levels were highest in 8 sec sonication group compared to other sonication groups with a significance in 2 sec group ($p<0.05$). No significant difference was determined regarding catalase activity although a decrease was determined in 8 sec and 10 sec groups.

CONCLUSIONS: Sonication administration for 8 seconds may be a critical point at the activities and levels of evaluated parameters.

Oxidative stress

Cod: 1301

PARAOXONASE ACTIVITY IN HYPERTENSIVE DISORDERS OF PREGNANCY

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BACKGROUND: Oxidative stress play an important role in hypertensive disorders of pregnancy (HDP). The aim of the study was to assess the activity of the HDL- associated antioxidative enzyme paraoxonase-1 (PON 1) in relation to the concentrations of HDL-cholesterol (HDL-C) and trace elements in order to evaluate it's role in regulation of pro/antioxidant homeostasis in patients with HDP and matched pregnant controls.

METHODS: The study included 26 pregnant women with preeclampsia (PE) and 27 with gestational hypertension (GH). The control group consisted of 34 healthy pregnant women. The PON1 activity was measured spectrophotometrically in presence of NaCl. HDL-C was measured with direct method based on selective inhibition of the non-HDL fractions. Copper and zinc concentrations were determined by atomic absorption spectrometry.

RESULTS: The PON 1 activities were significantly higher in GH groups compared with the pregnant controls (P=0,032) with median (interquartile range): 563 (304 -798) UL vs. 217 (178 - 504) U/L. This difference persisted even after correction of PON1 activities for HDL-C concentrations (PON1/HDL ratio): 348 (240-467) U/mmol vs. 147 (101 - 359) U/mmol, P=0,010). The values of PON 1 activities and PON1/HDL ratio did not differ significantly between patients with PE and pregnant controls (P=0,571), nor between patients with GH and PE (P=0,105). There was no difference in the HDL-C, copper and zinc concentrations between patients with GH or PE and pregnant controls. The PE patients had significantly increased concentrations of HDL-C compared to GH patients (P=0,047), whereas no difference in the concentrations of the copper (P=0,943) and zinc (P=0,455) was observed between the PE and GH patients. Serum PON 1 activities showed significant correlation with HDL-C in GH patients (r=0,508; P=0,007) and with zinc in PE patients (r=0,427; P=0,029).

CONCLUSIONS: Our results showed that the increase in PON1 activities in pregnant women with GH were unrelated to the alternations of HDL-C concentrations. Correlation between the PON 1 activities and the concentrations of zinc in women with PE indicating the existence of different protective antioxidative mehanisms in hypertensive disorders of pregnancy.

Oxidative stress

Cod: 1303

VITAMIN E AND REGRESSION OF CARDIAC OXIDATIVE STRESS

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BACKGROUND: Oxidative stress has been implicated in the development of hypercholesterolemic atherosclerosis. Vitamin E is an antioxidant. Vitamin E suppresses and slows progression of hypercholesterolemia-induced cardiac oxidative stress. It is not known if it is regresses the cardiac oxidative stress. Our objectives were to investigate if vitamin E regresses the hypercholesterolemia-induced cardiac oxidative stress.

METHODS: Four groups of rabbits each comprising of 6 rabbits were used for this study:
Group I. Control, regular diet; Group II. 0.25% cholesterol diet (2 months); Group III. 0.25% cholesterol diet for 2 months followed by regular diet (2 months); Group IV. 0.25% cholesterol diet for 2 months followed by regular diet with vitamin E (40 mg/kg-body wt./day/orally)for 2 months.
Serum levels of total cholesterol were measured using an automated Beckman Synchron LX20 clinical analyzer. Hearts were removed under anaesthesia at the end of the protocol for measurement of oxidative stress. Oxidative stress was assessed by measuring malondialdehyde (MDA), a lipid peroxidation product.

RESULTS: High cholesterol diet increased the serum levels of total cholesterol and cardiac MDA compared to control (Cholesterol: 2.04 ± 0.03 mmol/L vs. 38.91 ± 3.72 mmol/L); MDA: 0.074 ± 0.015 nmol/mg. protein vs. 0.234 ± 0.016 nmol/mg. protein). Regular diet following high cholesterol-diet lowered the cardiac MDA levels compared to high cholesterol diet (0.234 ± 0.016 vs. 0.183 ± 0.028 nmol/mg. protein). Vitamin E did not lower cardiac MDA as compared to regular diet (0.183 ± 0.028 vs. 0.169 ± 0.016 nmol/mg. protein).

CONCLUSIONS: In conclusion hypercholesterolemia increases cardiac oxidative stress and vitamin E does not regress hypercholesterolemia-induced cardiac oxidative stress.

Oxidative stress

Cod: 1304

CORONARY ARTERY DISEASES AND POLYMORPHISM GENES OF SUPEROXIDE DISMUTASE (SOD2) AND GLUTATHIONE PEROXIDASE (GPX1)

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BACKGROUND: The study of coronary artery diseases has become important in the last century due to population changes throughout the Western World that have led to an increase in the numbers of ischemic people. Coronary artery diseases are ischemic pathogenesis caused by partial obstruction (instable angina) or total obstruction (myocardial infarction) of one or many artery coronary. The occurrence of an acute coronary syndrome is caused by atherosclerotic disease. Several theories (genetic theory, free radicals theory), sometimes contradictory, are proposed in order to realize the mechanisms of artery coronary diseases. The objectives of our work are: i) Study of the variation of SOD and GPx enzymatic activity moreover the variation of TAS between healthy people and coronary people. (ii) Research of the association between the SOD2 gene Ala16Val polymorphism and the GPx1 gene Pro198Leu polymorphism with coronary artery diseases, also with SOD and GPx enzymatic activity, respectively and with other factors, such as age, sexe and tabagisme.

METHODS: Our study population was composed by a group of 106 people with coronary disease and a group of 141 healthy people. The enzyme activities and TAS were investigated by kit of Randox lab. Genotypes were determined by use of PCR-RFLP.

RESULTS: The principal results of this work are: (i) a decrease in SOD and GPx enzymatic activity and a decrease of TAS with coronary artery diseases; (ii) an association between Ala16Val polymorphism (specifically the heterozygous Ala / Val SOD2 gene) and coronary disease with tobacco; (iii) also an association between Pro198Leu (specifically the heterozygous Pro/ Leu GPx1 gene) polymorphism.

CONCLUSIONS: The contribution of nutritive antioxidants needs in people feeding, such as vitamins, micronutrients, physique activities and stopping tobacco represent major conditions for preventing cardiovascular accidents.

Oxidative stress

Cod: 1305

THE PROTECTOR EFFECT OF VOLTARENE TOWARDS THE OXIDATIVE STRESS INDUCED BY PARACETAMOL

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BACKGROUND: The aim of this work is to study the protective effect of diclofenac towards the oxidative stress induced by paracetamol toxicity.

METHODS: 60 male rats "Albinos wistar" were treated by oral gavage (per os) during seven days. A control group was treated by mineral water (0+0) mg/kg and a second group was treated with only a toxic dose of 100 mg/kg of PARA (100+0). Remaining lots were treated with a combination of different toxic doses of PARA and a therapeutic dose of DiCF (15+3, 100+3, 200+3 and 400+3) mg/kg.

RESULTS: Plasma concentration of amiotransferases (ASAT, ALAT), alkalines phosphatase (ALP), glutathione peroxidase (GPx), glutathione reductase (GR), glutathione (GSH), glucose, cholesterol, creatinin, direct and total bilirubin, significantly varied in the treated rats regarding to the witness's rats. The toxicity of PARA revealed by a dose dependant blood increases of ASAT, ALAT, ALP, GPx, GR, glucose, creatinin, bilirubin, and by decreases of cholesterol concentration and tissue GSH in comparisons to controls. The depletion of GSH and the increase of the oxidative stress enzymes (GPx and GR) suggest a detoxification function of the glutathione system. The association (PARA + DiCF) revealed a protective effect, resulting in the increase of the concentrations of ASAT, ALAT, ALP, GPx, GR, bilirubin and the increase of GSH.

CONCLUSIONS: Regarding to all these results, it has been suggested that DiCF has a protective action towards the toxic effects of PARA.

Oxidative stress

Cod: 1306

INVESTIGATING POLYMORPHISMS OF PAROXONASE 55 L/M AND 192 Q/R IN PATIENTS WITH FIBROMYALGIA

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BACKGROUND: Syndrome of Fibromiyalji (FM) is completely unknown disorder which is frequently seen in society with symptoms like chronic pain, fatigue, sleep disorders and morning stiffness and tenderly progresses at some certain points on patient's body. In recent years, although our vision of FM pathophysiology has been made progress, it's etiology and pathogenic mechanisms are still unknown.

METHODS: In our study, we intend to find answer to whether the level of PON 1, which is an antioxidant and it's polymorphism play any role in etiopathogenesis of FM. In this study, the patient group including 150 FM patients and the control group including 150 people were grouped. Level of PON-1 enzyme, PON-1 192 Q/R and 55 L/M polymorphisms were investigated. Supporting scales for clinic evaluation were implemented to group of patients such as tender point count, Fibromyalgia Impact Questionnaire score, Beck Depression Inventory, Visual Analog Scale (VAS) Pain Score.

RESULTS: That FM patient's plasma levels are significantly higher than control group have been determined. Additionally, any significant relation between FM and polymorphisms of PON-1 55 L/M and 192 Q/R haven't been found. Both two polymorphism frequency distributions of genotypes haven't indicated important differences between control and patient group. That PON-1 genotypes of relative ratio for FM risk are not significant statistically has been found. Statistically, a significant relation between PON-1 genotypes and clinic symptoms of FM patients haven't been determined as well. Lastly, an important relation between FM patient's PON-1 plasma levels and clinic scores haven't been found.

CONCLUSIONS: To sum up, in this study, any significant relation between FM disorder and polymorphisms of PON-1 55 L/M and 192 Q/R haven't been detected. The level of plasma PON-1 protein have been found significantly higher and the reason of it has been thought as a result of reactive increasing against increased oxidative stress in illness. This study must be repeated in wider and different ethnic populations.

Oxidative stress

Cod: 1307

SERUM PARAOXONASE LEVELS IN PATIENTS WITH BRAIN CANCER

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BACKGROUND: Paraoxonase (PON) is a calcium dependent 43kDa glycoprotein that is associated with HDL in human serum. PON has been demonstrated to be implicated in the protection of LDL and HDL from oxidation induced by copper ions as well as by other free radical generators. PON activity has been demonstrated to be reduced in pathologies associated with oxidative damage, e.g. CVD, diabetes, chronic renal failure and cancer. The aim of this study was to determine serum PON activity in the patients with brain cancer.

METHODS: This case control study involved a total of 30 patients with brain cancer and same number of age and sex matched healthy individuals. Serum PON activity in addition to lipid parameters were measured in both groups. Serum PON activity was determined using paraoxon as the substrate and measured by the increase in the absorbance at 412 nm due to the formation of 4-nitrophenol.

RESULTS: Serum PON activity was found to be lower in patients with brain cancer compared to the controls (59.41+/-13.46 U/L and 75.23+/-18.51 U/L respectively) ($p<0.05$). Serum HDL, LDL and triglyceride levels measured in the patient group were not significantly different from those of the control group ($p>0.05$).

CONCLUSIONS: We concluded that the serum PON activity is low in the patients with brain cancer compared to healthy controls. The importance of PON as a predictive risk factor for cancer should be assassed in future studies.

Oxidative stress

Cod: 1308

EVALUATION OF OXIDANT AND ANTIOXIDANT STATUS AND RELATION WITH PROLIDASE IN SYSTEMIC SCLEROSIS

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BACKGROUND: Systemic sclerosis (SSc) is a disease characterized by fibrosis of the skin and organs; it is associated with diffuse fibroproliferative microangiopathy and autoimmune background. The studies have shown that the production of excessive free radicals and increased collagen synthesis by the fibroblasts play an important role in the pathophysiology of SSc. Prolidase is an important marker in collagen turnover. We aimed to compare Total Oxidant Status (TOS), Total Antioxidant Status (TAS), Oxidative Stress Index (OSI) and prolidase levels of SSc patients and healthy controls. We also investigated the relationship between prolidase and oxidative stress.

METHODS: 38 SSc patients and 33 healthy volunteers were included in the study. Serum TAS, TOS and prolidase activity were evaluated in the groups.

RESULTS: It was found that the TOS and OSI levels of patients were higher than those in the control group (P = 0,012 and 0,015 respectively) whereas TAS was not significantly different between groups (P = 0.451). Prolidase activity was lower in patients than in controls (P = 0.008). There was a weak correlation between prolidase and OSI in patients. It was found that TAS was lower by marginal significance in the patients with lung and gastrointestinal tract (GT) involvement than the patients without those (P = 0,067 and 0,059 respectively).

CONCLUSIONS: Our data suggests that oxidative stress is increased in SSc. TAS is decreased in patients with lung and GT involvement. These results support that antioxidant treatment may be useful in SSc especially in patients with lung and GT involvement. Antioxidant treatment may prevent organ involvement in SSc. TAS may be a marker that predicts the risk of involvement of a specific organ. In addition prolidase may be a marker of SSc.

Oxidative stress

Cod: 1309

BENEFICIAL EFFECTS OF POMEGRANATE JUICE EXTRACT ON CELL CULTURE ENVIRONMENT

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BACKGROUND: Pomegranate juice have various antioxidant compounds, so it has been used for the treatments of different illnesses related to oxidative-antioxidative imbalance. In this study, on cell culture environment, oxidative status of mononuclear leukocyte cells and antioxidative effects of pomegranate juice against to H_2O_2 (hydrogene peroxide) dependent oxidative damage have been investigated.

METHODS: In this in vitro experiment, pomegranate juice extract in different concentrations dissolved in PBS (phosphate buffered saline) was given to mononuclear leukocytes in a cell culture environment and incubated for 30 minutes. Subsequently the cells have been washed and then 50 µmol/ml H_2O_2 was given to each group. After both incubation and hydrogen peroxide application of each group, oxidative status by using Erel method have been investigated. For statistical analyses Non-parametric Kruskall Wallis H and Mann-Whitney U tests have been used.

RESULTS: There are statistically significant differences between the negative control group and 100 µg/ml Pomegranate Juice Extract group; and positive control and 100 µg/ml Pomegranate Juice Extract + 50 µmol H_2O_2 group in respect to total oxidant status ($p \leq 0,05$ for all).

CONCLUSIONS: According to our findings, pomegranate juice has antioxidant effects against to reactive oxygen species. Pomegranate juice may be used as a protective and/or supportive treatment in diseases caused by reactive oxygen radicals.
Keywords. Antioxidant, hydrogen peroxide, oxidative stres, Pomegranate Juice

Oxidative stress

Cod: 1310

ARE BIOMARKERS OF OXIDATIVE STRESS AFFECTED BY THE MENSTRUAL CYCLE?

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BACKGROUND: Oxidative stress has been investigated to explain the pathological basis of many medical conditions. The purpose of this study was to investigate if and how oxidative stress status is influenced by both circulating hormones and antioxidant status during the menstrual cycle.

METHODS: 26 women not on hormonal contraceptives (34.0 ± 6.1 years, body mass index 22.3 ± 3.5 kg/m^2) participating in the EU project BIOCLAIMS were investigated at 4 times during a menstrual cycle, which were based on basal temperature measurements prior to the study: t1 in the early (day 6 ± 1), t2 in the late follicular phase (day 12 ± 2), t3 in the early (day 20 ± 2.5) and t4 in the late luteal phase (day 25 ± 2). Estradiol, progesterone, LH and FSH were measured. Biomarkers of oxidative stress included malondialdehyde (MDA, determined by GC-MS from Thermo Fisher Scientific, based on derivatization of MDA with 2,4-dinitrophenylhydrazine and representative ions in negative ion chemical ionization mode recorded at m/z 204 for MDA and m/z 206 for the deuterated analog, MDA-d 2, as internal standard), and myeloperoxidase (MPO, determined by a chemiluminescent immunoassay, Architect MPO assay, Abbott Diagnostics). The antioxidants vitamin C, vitamin E and carotenoids were determined by HPLC (with electrochemical, UV and fluorescence detection, respectively).

RESULTS: Expected changes in female sexual hormones and basal temperature were observed across the cycle. Total cholesterol changed significantly (P = 0.003), with significant differences between t1 (high) and t4 (low). No significant changes were observed for MDA. Also, α- and γ-tocopherol, α- and β-carotene, β-cryptoxanthin, lycopene, and lutein/zeaxanthin did not change. Changes in MPO showed a trend towards lower values at t3, but these changes did not reach statistical significance (P = 0.08). In contrast, plasma vitamin C concentrations changed significantly (P < 0.001) with significantly lower values at t3 (77.1 ± 18.4 µmol/L) and t4 (80.5 ± 21.0 µmol/L) compared to t1 (88.1 ± 23.8 µmol/L).

CONCLUSIONS: These data indicate that changes in female sexual hormone status during the menstrual cycle do not have an impact on lipid peroxidation in the presence of stable vitamin E and carotenoid levels.

Oxidative stress

Cod: 1311

THE EFFECT OF SILDENAFIL AND UDENAFIL TO THE TESTICULAR DAMAGE FOLLOWING ISCHEMIA/REPERFUSION INJURY IN RATS

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BACKGROUND: Ishemia reperfusion injury can cause testicular damage and phosphodiesterase inhibitors are reported to regulate antioxidant activity. We aimed to investigate prevention of both ipsilateral and contralateral testicular damage with two different phosphodiesterase inhibitors after testicular detorsion in rats.

METHODS: Twenty eight adult male rats were randomly divided into four groups as follows: group 1, sham operated, (n=7); group 2, testicular torsion and detorsion (T/D) (n=7); group 3, T/D and sildenafil administered before detorsion (T/D+S) (n=7); group 4, T/D and udenafil administered before detorsion (T/D+U) (n=7). The tissue levels of malondialdehyde (MDA), total sulfhydryl (T-SH) and nitrite were evaluated.

RESULTS: As compared to group 1, significant increased tissue levels of MDA (p=0.001), significant decreased levels of T-SH (p=0,038) insignificant increased levels of nitrite and were found in group 2. In contrast, as compared to group 2, levels of MDA decreased significantly and T-SH levels increased significantly in group 3 and 4. The decrease in nitrite levels were insignificant in the last two groups.

CONCLUSIONS: This study indicates that, intraperitoneal administration of both sildenafil and udenafil efficiently supress radical production while they decrease the histologic changes after testicular ischemia reperfusion injury.
Key Words: testis torsion, ischemia reperfusion, rat, sildenafil, udenafil.

Oxidative stress

Cod: 1312

AGE RELATED CHANGES IN ANTIOXIDANT RESPONSE TO OXIDATIVE STRESS INDUCED BY MODERATE JUDO TRAINING IN WELL-TRAINED JUDOKAS

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BACKGROUND: Oxidative stress has been defined as an imbalance of pro-oxidants and antioxidants, leading to potential damage. Physical exercise also increases oxidative stress. Exercise can have different effects on oxidative stress depending on mode, duration, training load, training specificity and the basal level of training. The aim of this research was to investigate the acute effects of judo training on oxidative stress biomarkers in well-trained judokas, as well as to determine physiological response of organism after applied training.

METHODS: The study was carried out on 29 elite judo athletes (20 males and 9 females, aged 21.1±6.4 years) who had regular exercising and training habits. The participants completed one session of 90 minute technical skill exercise interval with the training load. Training load was adjusted approximately 70% of each athlete's maximal heart rate. Blood samples were taken before and after the exercise. Oxidative stress status was evaluated by measuring serum levels of total antioxidant status (TAS) and total oxidant status (TOS).

RESULTS: A significant post-exercise decrease was observed for TAS in all subjects [from 1.73 (1.69-1.85) mmol trolox Eq/L to 1.59 (1.56-1.65), p<0.01)]. This significant decrease in TAS was observed only in male junior judokas (aged <19 years) [from 1.86 (1.67-1.91) to 1.57 (1.41-1.70) (p=0.011)]. Any significant change was not found TOS [from 25.9 (22.4-34.8) μmol H202 Eq/L to 25.6 (20.9-42.7), (p=0.285)] in all subjects.

CONCLUSIONS: These results suggest that moderate judo exercise is responsible for a significant decrease in blood TAS male junior judokas, and senior male judo athletes have higher endogenous antioxidant protection compared to junior subjects. Moderate judo training and judo exercise are associated with excessive consumption of antioxidants, and regular physical exercise enhances the antioxidant defense system and protects against exercise induced oxidative stress.

Oxidative stress

Cod: 1313

THE RADIOPROTECTIVE EFFECTS OF PROPOLIS AND CAFFEIC ACID PHENETHYL ESTER ON NITROSATIVE STRESS IN LENS TISSUE IN RADIATION-INDUCED CATARACT IN RAT

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BACKGROUND: The aim of this study was to investigate whether Propolis and Caffeic acid phenethyl ester (CAPE) prevent radiation- induced cataractogenesis.

METHODS: Seventy-four Sprague-Dawley rats were randomly divided into six groups. Group 1 (Irradiation (IR) + Propolis) received total cranium irradiation and propolis was given orally through an orogastric tube daily. Group 2 (IR+CAPE) received total cranium irradiation plus CAPE intraperitoneally (IP) every day. Group 3 (IR) received 5 Gy of gamma irradiation as a single dose to total cranium plus 1 ml saline dailly. Group 4 received daily plain saline. Group 5 received daily plain dimethyl sulfoxide (DMSO). Group 6 (Normal control group) did not receive anything.

RESULTS: At the end of the 10 day time period, cataract developed in 80% of the rats in group 3 (irradiation (IR) group). After irradiation, cataract rate drop to 30% and 40% in groups which treated with Propolis and CAPE respectively. All nitrosative stress parameters were significantly higher in Group 3 compared to all other groups.

CONCLUSIONS: The results suggest that Propolis and CAPE have an important role on nitrosative stress and free radical scavenging activities in the irradiation-induced cataractogenesis, and reduce nitrosative stress markers. Propolis was found to be more effective in anti-cataractogenic effect than CAPE.

Oxidative stress

Cod: 1314

THE RADIOPROTECTIVE EFFECT OF NIGELLA SATIVA ON NITROSATIVE STRESS IN LENS TISSUE IN RADIATION-INDUCED CATARACT IN RAT

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BACKGROUND: Cataract blindness is the major cause of preventable blindness worldwide especially in the developing countries. Eye morbidity is widely observed in patients receiving total-body irradiation prior to bone marrow transplantation or radiotherapy. The aim of this study was to investigate the antioxidant and radioprotective effects of Propolis and Caffeic acid phenethyl ester (CAPE), Nigella sativa oil (NSO) and Thymoquinone (TQ) against ionizing radiation-induced cataracts in lens after total cranium irradiation of rats with a single dose of 5 Gy.

METHODS: 74 Sprague-Dawley rats were used for the experiment. The rats were randomly divided into 8 groups. Group A (Irradiation (IR) plus NSO), Group B (IR plus Propolis), Group C (IR plus TQ), Group D (IR plus CAPE), Group E (IR) received 5 gray (Gy) of gamma irradiation as a single dose to total cranium plus 1-ml saline through an orogastric tube, Group F1 (the control group of A) just without 1-ml saline through an orogastric tube did not receive NSO, TQ, CAPE and Propolis, Group F2 received dimethyl sulfoxide intraperitoneally injections at an equal volume of that Propolis, TQ, and CAPE was dissolved for group B, C and D respectively, Group F3 (normal control group) only fed with standard laboratory chow and water. Supplementation period was 10 days. Propolis, CAPE and TQ were dissolved in dimethyl sulfoxide just before giving to the rats.

RESULTS: SOD activity in group E was lower but GSH-Px, XO activity and MDA levels was higher than all other groups. Total superoxide scavenger activity and non-enzymatic superoxide scavenger activity were not statistically significant in group E compared with the other groups.

CONCLUSIONS: These results suggest an important role of oxidative stress in the irradiation-induced cataractogenesis with naturally occurring compounds (NSO, TQ, CAPE and Propolis) playing the role of an antioxidant and free radical scavenger. However Propolis and NSO were found to be more potent than the others. These are likely to be a valuable drug for protection against gamma-irradiation and/or be used as an antioxidant against cataractogenesis.

Oxidative stress

Cod: 1315

FREE LIGHT CHAINS CONJUGATED CYSTEINYLGLYCINE AS AN INDICATOR OF IMPAIRED THIOL METABOLISM IN MULTIPLE MYELOMA AFFECTING PHYSICAL PROPERTIES OF POTENTIALLY AMYLOIDOGENIC PROTEINS

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BACKGROUND: Immunoglobulin free light chains are one of elements of multiple myeloma pathology. Kappa and lambda free light chains may form a wide spectrum of deposits including tubular casts, glomerular amorphous deposits in light chain deposition disease, and well organized structures in amyloidosis. Until now there is no detailed data addressing changes in protein structure and physical properties of monoclonal free light chains. In present work we investigated S-thiolation process of monoclonal free light chains obtained from urine of pateints with different forms of monoclonal gammapathy.

METHODS: Human monoclonal free light chains were obtained from urine by salt fractionation. Cysteine, homocysteine, cysteinylglycine and glutathione were liberated by reducing disulphide bound with tris(2-carboxyetyl) phosphine and derivatized using 2-chloro-1-methylquinolinium tetrafluoroborate. Quantitative determination of derivatized thiols was performed by high performance liquid chromatography.

RESULTS: Human monoclonal free light chains are extensively thiolated. Total thiols concentrations (nM/mg protein) is significantly different for kappa and lambda types, respectively 10,74 nM/mg vs 3,43 nM/mg. For both types of monoclonal proteins profiles of the thiolation were similar. In both cases the main thiole connected with free light chains was cysteine - 84.5% of total SH. Concentrations of cysteinylglycine and homocysteine were almost equal - 6.8% and 6.5%. Concentration of glutathione was low 0.9%. Thiolation profile for policlonal light chains was different. Concentration of cysteinylglycine (the most reactive sulphydryl compound investigated) was four times lower (1,5% vs 6.8%) as compared with monoclonal light chains.

CONCLUSIONS: Different thiolation profile of monoclonal and polyclonal free light chains may be interpreted as a reflection of disrupted redox balance in proliferating neoplastic cells. Upregulation of thiol metabolism, pathological thiol status and high activity of g-gluthamyl tranpeptidase may influence thiol-associated drug resistance mechanisms. Thiol modified free light chains may display different properties predestinating them to formation different forms of protein deposits.

Oxidative stress

Cod: 1316

OXIDATIVE STRESS, OXIDATIVE DNA DAMAGE AND SEVERITY OF PSORIASIS

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BACKGROUND: Psoriasis is a chronic inflammatory disease that affect the 1-3% society over the world. Increased oxidative stress has been previously shown to correlate with psoriasis research. Ischemia-modified albumin (IMA), a marker of oxidative stress in a newly defined and IMA levels were higher in patients with psoriasis. Oxidative stress in many diseases such as psoriasis causes oxidative deoxyribonucleic acid (DNA) damage. 8-hydroxydeoxyguanosine (8-OH-Dg) level marker of oxidative DNA damage. Heat shock proteins (HSP) are present in all cells in the presence of cellular stress, such as synthesized by keratinocytes and protects the cell against increased further oxidative damage levels. For the clinical staging of the disease psoriasis area severity index (PASI) is used. This study in psoriasis patients of cellular stress, oxidative stress levels and oxidative DNA damage and to determine the relationship between the level of PASI score is done.

METHODS: University volunteers who participated in the study with 39 patients with psoriasis patients and 39 healthy individuals were similar demographic characteristics. The levels of 8-OH-dG and HSP27 in plasma were tested by enzyme-linked immuno sorbent assay (ELISA) kit. Blood IMA levels were determined using colorimetric methods described by Bar-Or et al.

RESULTS: The level of IMA 0,883 per patient group and the control group was found in 0.889 IMA level. We found no significant difference between the two groups. Also according to the severity of cases of psoriasis found no significant difference in the levels of IMA. The mean serum 8-OH-dG levels in patients 25.5 ± 5.9; 24.8 ± 7.1, the average was found in healthy individuals. We found no significant difference between the two groups. Also according to the severity of cases of psoriasis found no significant difference in the levels of 8-OH-dG. Patients with a median serum levels of HSP27 31.7 ± 75.0, the mean was 4.2 ± 1.1 was found in healthy individuals. In our study, we found that the difference between the two groups was statistically significant.

CONCLUSIONS: Genetic and environmental differences are important in psoriasis. Given these differences in a more comprehensive studies are needed across the country.

Oxidative stress

Cod: 1317

THE RADIOPROTECTIVE EFFECT OF THYMOQUINONE ON OXIDANT/ANTIOXIDANT SYSTEM IN TONGUE TISSUE OF RATS EXPOSED TO TOTAL CRANIAL IRRADIATION

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BACKGROUND: Radiation therapy is a common and important tool for cancer treatment. Head and neck cancers patients treated with radiotherapy suffer severe side effects during and following treatment. The aim of this study was to evaluate the effect of thymoquinone (TQ) on oxidant/antioxidant system in the tongue tissues of rats with or without exposed to total cranium irradiation.

METHODS: 32 Sprague-Dawley rats were used for the experiment. The rats were randomly divided into 4 equal groups. Control group (CG) only fed with standard laboratory chow and water. Sham control group (SCG) received dimethyl sulfoxide (DMSO) intraperitoneally (ip) injections at an equal volume of that TQ used in irradiation (IR) plus TQ group. IR group received total cranium 5 Gy of gamma irradiation as a single dose plus physiological saline ip. IR and plus TQ group received both 5 Gy of gamma irradiation as a single dose to total cranium and TQ (50 mg/kg/day daily by ip.) injection starting 30 minutes before the radiation dose and subsequently daily for 10 days after irradiation. TQ was dissolved in DMSO just before giving to the rats.

RESULTS: GSH-Px, GSH, TSSA, NSSA and SOD activities were significantly increased in the CG and SCG's when compared to the IR group and IR plus TQ groups. MDA levels, nitric oxide (NO.), nitric oxide synthase (NOS) activities, peroxynitrite (ONOO–) and xanthine oxidase (XO) activity significantly increased in the IR group when compared to the CG and SCG's. However, when IR group and IR plus TQ group compared, MDA level and XO activity were significantly increased in the IR group.

CONCLUSIONS: In view of the data obtained in this study, by reducing the formation of NO., ONOO– and MDA an indicator of lipid peroxidation and decreasing XO, NOS activities, TQ have showed the antioxidant effects and a free radical scavenging activity and reduced oxidative stress in the tongue tissue of rats exposed to gamma irradiation. TQ may be a beneficial agent in protection against ionizing radiation-related tissue injury. Therapy with antioxidants may lead to the increase in the antioxidant defense system and thus improvement in clinical symptoms in radiation therapy.
Keywords: Thymoquinone, antioxidant, enzymes, irradiation, tongue tissue.

Oxidative stress

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INVESTIGATION EFFECTS OF ALISKIREN ON TORSION/DETORSION INJURY INDUCED IN RAT TESTIS

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BACKGROUND: Testicular torsion is a clinical case, and patients typically present with severe acute unilateral scrotal pain and vomiting. Unfortunately treatment of testis torsion is not fully understood, therefore clinical and experimental studies are performed continuously. Renin and angiotensin system contributed to pathophysiology of several diseases. Aliskiren (ALS) inhibits the renin on the first step of this system. Our aim is to investigate the effect of aliskiren on unilateral testis damage caused by experimental testis torsion and detorsion.

METHODS: Forty-eight rats were divided into eight groups of six animals; Group 1: Sham-operated control group, Group 2: Sham-operated + ALS 200mg/kg(oral) group, Group 3: Torsion group(Tor): Rats were subjected to the surgical procedures and underwent intestinal ischemia for 120 min, Group 4: Torsion/Detorsion group(Tor/Det): Rats were subjected to the surgical procedures and underwent intestinal ischemia for 120 min followed by reperfusion for 120 min, Group 5: Tor+ALS 100mg/kg group: Rats were subjected to the surgical procedures and received ALS 100mg/kg (oral), Group 6: Tor+ALS 200mg/kg group: Rats were subjected to the surgical procedures and received ALS 200mg/kg (oral), Group 7: Tor/Det + ALS 100mg/kg group; Rats were subjected to the surgical procedures and received ALS 100mg/kg (oral), Group 8: Tor/Det + ALS 200mg/kg group; Rats were subjected to the surgical procedures and received ALS 200mg/kg (oral).The right testes of the rats were subjected to torsion and detorsion during two hours. After experimental procedures, testicular tissues were examined using specific biochemical methods.

RESULTS: Unilateral testis tissue glutathione (GSH) levels in the Tor group decreased compared with the control and Tor + ALS groups. Superoxide dismutase (SOD) levels of Tor and Tor/Det groups was lower than Tor and Tor/Det + ALS groups. In all groups SOD activities and GSH levels were proportional but MDA levels was observed in contrast to these values. Both doses of ALS treatment groups enhanced SOD and GSH levels while reduced MDA levels.

CONCLUSIONS: The administration of ALS may be useful for preventing ischemic damage on unilateral testes injury in rats.
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Oxidative stress

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OXIDATIVE/NITROSATIVE STRESS IN PATIENTS WITH MODIC CHANGES

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BACKGROUND: Degenerated discs and endplate abnormalities can be a cause of discogenic low back pain. Oxidative/nitrosative stress are involved in the pathogenesis of various diseases. However, the presence of oxidative/nitrosative stress has not been studied in patients with discogenic low back pain and endplate changes on MRI. The aim of this study was to assess the levels of oxidative/nitrosative stress biomarkers in patients with modic changes (MCs) and to find an information about Modic aetiopathology.
Study Design: Oxidative/nitrosative stress in vertebral endplates of patients with discogenic low back pain and MCs (types I, II and III) endplate changes on MRI.

METHODS: Patients with MCI, II and III (n = 32) and age- and sex-matched healthy group as controls (n = 15) were enrolled in this study. 3-Nitrotyrosine (3-NT) and nitric oxide (NO) levels as nitrosative stress biomarkers were measured with ELISA. Also, the activities of catalase (CAT) and superoxide dismutase (SOD), and the levels of malondialdehyde (MDA) as oxidative stress biomarkers were determined on spectrophotometer.

RESULTS: Oxidative/nitrosative stress was confirmed by the significant elevation in NO, 3-NT, MDA and decreased of CAT and SOD activities in MCI compared to other MCs and control group ($p<0.05$). The highest CAT and SOD activities in patients with MCII were found in all of MCs. However, the levels of NO, 3-NT and MDA showed moderate increase in this group ($p<0.05$). In addition, while the levels of oxidative stress biomarkers in MCIII were higher than control group ($p<0.05$), the levels of nitrosative stress biomarkers were similar to control group ($p>0.05$).

CONCLUSIONS: Our results indicate that increased MDA, 3-NT, NO levels reflect the increased levels of oxidative/nitrosative stress in MCI, and this situation may be important in its pathogenesis. Also, we believe that insufficiency of antioxidant barrier may cause oxidative damage in MCI, so antioxidant therapy may be beneficial when given in addition to the routine medical treatment.
Key words: Modic changes, oxidative /nitrosative stress, malondialdehyde, nitrotyrosine

Oxidative stress

Cod: 1320

METHODOLOGICAL EVALUATION OF A SPECTROPHOTOMETRIC METHOD FOR THE ANALYSIS OF SERUM ISCHEMIA MODIFIED ALBUMIN

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BACKGROUND: Recently a sensitive and specific diagnostic myocardial biomarker named by ischemia-modified albumin (IMA) can recognize cardiac ischemia in minutes. Till now, an increasing number of publications showed the importance of this marker in both cardiac and non cardiac conditions. The only one FDA approved assay, namely albumin cobalt binding (ACB) test is clinically available for IMA determination in serum samples. Several colorimetric assays might affected by many preanalytical variables. These factors should be performed to exclude any possible interferences in measurements. In ACB test, it was showed that fatty acid binding could influence cobalt binding to albumin. In this study, we aimed to evaluate performance characteristics such as hemolysis and bilirubin interference and storage conditions of IMA determination by ACB test.

METHODS: A spectrophotometric method for IMA quantification in human serum samples based on measuring residual Co (II) that unbound to serum albumin were used. We determined the effect of storage, hemolysis and dilutional effects of the IMA levels in serum.

RESULTS: Storage of serum sample has some effects on IMA when stored both at 4 °C and at room temperature for up to 5 hours. In hemolysis interference experiment, interference was detected for the different hemoglobin concentrations. In diluted samples with both PBS and distilled water, higher ABSU was detected.

CONCLUSIONS: It was found hemolysis interference was detected at lower concentrations. IMA should be measured immediately because this assay is not stable when stored at 4 °C and at room temperature. The effects of storage conditions should be studied in samples stored at −80 °C and at −20 °C. Dilutional effects should be kept in mind especially in low amount of samples.

Oxidative stress

Cod: 1321

ORAL GLUCOSE TOLERANCE TEST-DERIVED PLASMA MARKERS IN PATIENTS WITH INCREASED RISK FOR TYPE 2 DIABETES

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BACKGROUND: Progression from prediabetes to type 2 diabetes (T2DM) creates the challenge for laboratory medicine. The aim of the study was to evaluate some markers of oxidative stress in the blood of patients with increasing risk for T2DM, using the idea of oral glucose tolerance test (OGTT).

METHODS: 30 to 63 year old Caucasians with increased risk for T2DM, non-smokers with no acute and chronic disease, using no special diet and medication, based on results of 75g OGTT and body mass index (BMI kg/m^2), were divided into groups: G1, n=24, normal glucose tolerance (NGT) and normal BMI (19-24,9); G2, n=24, NGT and overweight (BMI 25,0-29,9); G3, n=24, NGT and obesity (BMI 30,0-39,9); G4, n=24, impaired glucose tolerance and overweight/obesity; G5, n=22, newly diagnosed T2DM and overweight/obesity, with fifty-fifty males and females. Plasma glucose, Glu, insulin, Total Antioxidant Status, TAS (Randox) and thiobarbituric acid-reacting substances, TBARS (Sigma) were determined during OGTT (0′ and 120′). Lipids, hsCRP and HbA1c (Bio-Rad) were measured fasting. Insulin sensitivity (ISI-0,120) and resistance (HOMA-IR) was measured. Index R75=[120′/0′] has been proposed for TAS and TBARS. Intra-assay and inter-assay coefficients of variation were calculated for insulin (3,3; 4,0%), TAS (1,6; 3,5%) and TBARS (2,0; 3,6%). STATISTICA10.0 and MedCalc12.6.0 programs were used.

RESULTS: 1.Increasing TAS-0′ (median:lower-upper quartile; mmol/L) from G1 (1,28:1,25-1,35) to G4 (1,51:1,37-1,68) and the lowest in G5 (1,20:1,11-1,27) were observed, along with decreasing TAS-R75, increasing TBARS-0′ and TBARS-R75 from G1 to G5. 2.Entire study population presented the correlation TAS-R75&TBARS-R75 (R=-0,48). Glu120′ correlated with TAS-R75 independently from other metabolic factors, while the same variables affected TBARS-R75 regularly. 3.ROC curves analysis (% sensitivity; % specificity; AUC) highlighted ISI-0,120 ≤24,1 comparing G3 and G4 (92%; 100%; 0,995), and TAS-0′<1,30mmol/L comparing G4 and G5 (86%; 90,5%; 0,912).

CONCLUSIONS: Insulin sensitivity indexes are irreplaceable in predicting prediabetes in obese subjects. The development of T2DM may be associated with antioxidant insufficiency more, and OGTT could help in assessing individual susceptibility to oxidative stress in this case.

Oxidative stress

Cod: 1322

BIOMARKERS, INDICATORS OF ENVIRONMENTAL STRESS IN PARMELIA PERLATA AT THE LEVEL OF THE REGION OF ANNABA (ALGERIA)

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BACKGROUND: The town of Annaba is regarded as one of the most polluted cities in Algeria. This is due, on the one hand, to the existence of steelworks (ISPAT factory) and a very important car fleet; and, on the other hand, to the city's topographical and climactic characteristics which create an atmosphere that is conductive to pollution. The present study attempts to evaluate the effects of the environmental stress of a lichenous species epiphyte foliaceous Parmelia perlata. It also attempts to study the impact of urban and industrial pollution in the stress physiology of the lichen Parmelia perlata.

METHODS: Lichens were transplanted from an unpolluted area located in a natural in to 2 area polluted areas located at Annaba one with low lichenous diversity this one is prone to various sources of pollution related to its strong urbanization, its industrial complexes and its very intense road traffic. Lichens were exposed to air pollution for 4 months in the form of transplants. After the exposure period, lichens were collected and the chlorophylls a, b, antioxidant enzymes such as Ascorbate peroxidase (APX), Guaiacol-peroxidase (GPX) and Catalase (CAT) were analyzed.

RESULTS and CONCLUSIONS: Our results indicate firstly that the urban environment has a harmful and obvious influence on Parmelia perlata and generally on the lichenous epiphytic vegetation, this influence attenuates gradually with the distance to the urban centre. In addition, physiological parameters like the antioxidant parameters could be used as early warning indicators of stress of atmospheric pollution of lichens.
Key words: Air pollution, lichen biomonitoring, chlorophylls, enzymes, Parmelia perlata