Oral – [A-10-739-2]
Effect of unsaturated fatty acid ingredient of *Nigella sativa* (Black Seed) on human breast cancer cells
Hasanzadeh Chaharanman Kourosh, Liatiffah A. Latiff, Panieh Rahimi, Nordin Hj. Lajis

Department of Community Health, Faculty of Medicine and Health Sciences, University Putra Malaysia, 43400, UPM, Malaysia

Faculty of Basic Science, Biology Department, Biochemistry Unit, Alzahra University, Tehran, Iran

Laboratory of National Product, Institute of Bioscience, Faculty of Medicine and Health Sciences, University Putra Malaysia, 43400, UPM, Malaysia

E-mail addresses: KouroshHasanzadeh@yahoo.com (H.G. Kourosh), LatiffahA.Latif@gmail.com (L.A. Latiff), hanachi.wrc@yahoo.com (P. Hanachi), NordinHj.Lajis@yahoo.com (N.H. Lajis)

Introduction: Fatty acids have previously been shown to modulate eicosanoid metabolism both in vivo and in vitro. Epidemiological and experimental studies have revealed an association between dietary fat and the incidence of breast cancer. Overweight women are most commonly observed to be at increased risk of postmenopausal breast cancer and at reduced risk of pre-menopausal breast cancer. Linoleic acid (LA) is one of the mean fatty acid compositions of *Nigella sativa*, from the unsaturated group of oil proliferation, which has shown some effects in vitro and in vivo studies. The objective was to investigate inhibition and anti-cancer effects of Linoleic acid on human breast cancer cells.

Methods: The apoptosis and cytotoxic activity assays were used in order to find toxic effects, and the results were supported by flow cytometry (Cell cycle analysis).

Results: The results showed the cytotoxic effect of Linoleic acid on the breast cancer cell lines that can be posed as an anti-cancer effect of linoleic acid. According to our findings, when the concentration of linoleic acid was increased, compared with the concentrations currently being reported, it shows anti-cancer effects.

Conclusion: We came to this conclusion that Linoleic acid has an inhibiting effect on human breast cancer cell lines which can be due to its two double-bonding molecular structure.

Keywords: Linoleic acid, *Nigella sativa*, MDA-MB-231, MCF-7

Oral – [A-10-1189-1]
Preventive effect of omega-3 fatty acids on estrogen induced hepatic steatosis in rat
Marian Chahardahcherik, Ali Shahriari, Peyman Asadian, Saleh Esmaeilzadeh

Faculty of Veterinary Medicine, Shahid Chamran University of Ahvaz, Ahvaz, Iran

School of Veterinary Medicine, University of Lorestan, Iran

E-mail addresses:adamtane_2005@yahoo.com (M. Chahardahcherik), alishahriari45@gmail.com (A. Shahriari), asadiani3@gmail.com (P. Asadian), s_esmaeilzadeh@scu.ac.ir (S. Esmaeilzadeh)

Introduction: Estrogen has lipogenic effect. Hepatic steatosis due to estrogen therapy increases activity of inflammatory markers, particularly IL-6 and TNF-α which in turn cause more lipogenesis. Omega-3 fatty acids modulate hepatic lipogenesis. In this research preventive effect of omega-3 fatty acids on estrogen-induced steatosis in rats was evaluated.

Methods: For this study, 25 female Wistar rats was divided into 5 equal groups. 4 of them have received 2 mg/kgBW/SC of 17α-ethinylestradiol for inducing steatosis on 10 consecutive days and simultaneously given 250 mg/kgBW, 500 mg/kgBW and 1000 mg/kgBW omega-3 by gavage every other day. The remnant group is control. In the end of experiment, plasma ALT and AST and TNF-α levels were determined and liver samples were stained with H&E and Oil Red O staining.

Results: Histologically evident hepatic microvesicular steatosis was seen in group ethinylestradiol. Group 250 mg/kgBW only showed mild deposits of fat, whereas in the other groups hepatic steatosis was prevented. Group ethinylestradiol, 250 mg/kgBW and 500 mg/kgBW were associated with significantly (p < 0.05) elevated plasma TNF-α level. And the more significantly lower level of TNF-α was observed on group 1000 mg/kgBW. Plasma AST level increased significantly (p < 0.05) in group ethinylestradiol and 250 mg/kgBW and decreased significantly (p < 0.05) in group 500 mg/kgBW and 1000 mg/kgBW. Plasma ALT level increased significantly (p < 0.05) in group ethinylestradiol 250 mg/kgBW and 500 mg/kgBW and it decreased in 1000 mg/kgBW.

Conclusion: A decline in plasma transaminases and TNF-α levels and normalization of pathologic evidence of steatosis were observed on treatment with 1000 mg/kgBW of omega-3, so this dosage protects the liver against steatotic injuries.

Keywords: 17α-ethinylestradiol, Omega-3 fatty acids, Hepatic steatosis, Rat

Oral – [A-10-1284-1]
The effect of zinc supplementation on growth and bone health in Iranian paediatric patients with transfusion-dependent β Thalassemia
N. Naghme, Zahra Mirhosseini, Majid Ghayour-Mobarhan, Suzana Shasar, Noor Aini My Mohdyusof, Abdollah Banishahes, Azmi Nor Kamarudin

Nutrition and Dietetics Department, Faculty of Allied Health Sciences, University Kebangsaan Malaysia (UKM), Kuala Lumpur, Malaysia

E-mail address: na_mirhosseini@yahoo.com (N.N.Z. Mirhosseini)

Introduction: Beta Thalassemia syndromes are the most common hereditary hemoglobinopathies. The life expectancy of patients with Thalassemia has greatly improved over the last decade; however, abnormal growth and low bone mineral density are the common features among patients suffering from transfusion-dependent β Thalassemia. The objective of this study was to determine the effect of zinc supplement on growth and bone health in Iranian paediatric patients with transfusion-dependent β Thalassemia.

Materials and methods: The study was an interventional study, double-blinded placebo-controlled trial, was performed on 110 subjects, aged 8 to 18 years old, who fulfilled the eligibility criteria for intervention. This study included anthropometric measurements, food intake, biochemical assessment and bone densitometry test (DXA scan). Subjects were randomized into zinc (30 mg zinc sulphate) and placebo group for a period of nine months. Outcome measures were collected at baseline, 3, 6 and 9 month.

Results: Results of study indicated that malnutrition, as assessed using body mass index (BMI), was detected in 44% and 19.7% of boys and girls, respectively. Short stature affected more than 44% and 37% of boys.

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and girls, respectively. Low bone mineral density in lumbar spine and femoral area were 82% and 52%, respectively. Results of intervention showed that zinc supplement improved several parameters of nutritional status of both boys and girls, including height, triceps, mid-upper arm circumference (MUAC) and wrist circumference (p<0.05 for all parameters). Percentages of increment for these parameters was higher in intervention group as compared to placebo, i.e. height 3% vs 2% (boys) and 2.5% vs 2% (girls), triceps 12% vs 3.5% (boys) and 23% vs −0.8% (girls), MUAC 3.5% vs 1.4% (boys) and 5.6% vs 2.7% (girls), wrist circumference 1.5% vs −0.3% (boys) and 11% vs −1.3% (girls). Zinc supplement did not significantly affect bone density indices, except for, an increment of osteocalcin among girls supplemented with zinc. Percentage of changes for osteocalcin in girls was 18% and 13% for zinc and placebo groups, respectively. In conclusion, this study indicated that malnutrition and low bone mineral density were prevalent among β Thalassemia patients. There is a need to conduct a timely nutritional intervention as a routine care among β Thalassemia patients, in order to prevent adverse health or clinical outcomes associated with malnutrition and nutrient deficiencies.

Conclusion: Zinc supplementation improved nutritional status of these patients. There is a need to conduct a timely nutritional intervention as a routine care among β Thalassemia patients, in order to prevent adverse health or clinical outcomes associated with malnutrition and nutrient deficiencies.

Keywords: Zinc supplement

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Oral – [A-10-1247-1]
Recycling of ascorbic acid by erythrocytes during and its effect on life span determination
Syed Ibrahim Rizvi, Dileep Kumar, Kantti Pandey
Department of Biochemistry, University of Allahabad, Allahabad, India
E-mail addresses: sirizvi@gmail.com (S.I. Rizvi), dileep@gmail.com (D. Kumar), kantipandey@rediffmail.com (K. Pandey)

Introduction: The plasma antioxidant capacity is decreased during aging in humans. Ascorbic acid (ASC) is the primary antioxidant present in plasma, and erythrocytes being the most abundant cells in the blood, have been reported to play a crucial role in recycling ASC in blood plasma. The erythrocyte plasma membrane redox system (PMRS) and ascorbate free radical (AFR) reductase is involved in the reduction of AFR to ASC in the plasma.

Objectives: The present study was undertaken to determine the involvement of erythrocyte PMRS in recycling of ASC during aging in humans. An effort has also been made to correlate PMRS and AFR reductase activity with the life span of different animals.

Materials and methods: We have determined the activities of AFR reductase and PMRS in erythrocytes obtained from 61 normal healthy subjects of both sexes between the ages of 22 and 79 years. Determinations of the above parameters have also been done in different animals.

Results: Results show an age-dependent increase in the activity of erythrocyte AFR reductase in humans which shows a significant positive correlation with the activity of PMRS. We also present evidence that the erythrocyte PMRS activity is high in humans and flying birds compared to other vertebrates.

Conclusion: We explain the age-dependent increase in erythrocyte ASC recycling on the basis of a compensatory/protective mechanisms which operates to maintain the ASC level in plasma and thereby minimize oxidative stress during aging. We hypothesize that PMRS activity may also be a factor in the determination of life span.

Keywords: Ascorbic acid, Erythrocyte, Human aging, PMRS, Life span

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Oral – [A-10-1321-1]
Vitamin E is activated by phosphorylation to α-tocopheryl phosphate
Angelo Azzi
Vascular Biology Laboratory, JM USDA-HNRCA at Tufts University, Boston, MA 02111, USA
E-mail address: angelo.azzi@tufts.edu

Vitamin E (α-Tocopherol), traditionally described as an antioxidant, has revealed to possess specific cellular functions that are independent of its radical scavenging properties. It inhibits protein kinase C and P3 kinase, as well as activates protein phosphatase 2A and diacylglycerol kinase. Furthermore, at transcriptional level, several genes (the first to be described have been CD36, a-TTP, a-tropomysin, and collagenase) are modulated by α-tocopherol. α-Tocopheryl phosphate (α-TP) is synthesized and hydrolyzed in animal cells and tissues; it modulates also several cell functions. While it is similar to α-tocopherol (α-T), α-TP appears to be more potent than α-T in inhibiting cell proliferation, down regulating CD36 transcription, inhibiting atherosclerotic plaque formation etc. In cells and animals α-TP does not act by liberating α-T; rather, the intact molecule appears to be more potent than α-T itself. α-TP can be defined as the active form of α-T. Administration of α-TP to cells or to animals requires its transfer through membranes. Specific inhibitors, glybenclamide and probenicid showed to inhibit α-TP transport and to eliminate the effects caused by α-TP to cells, in a dose-dependent way. In a search for genes that are specifically and strongly affected by a TP, gene arrays representing essentially all human genes were used. A group of genes was found that is up-regulated by a TP but not by a T; suggesting that in some cells a T is not sufficiently converted to a TP. Genes which were regulated by both compound were more affected by a TP than by a T.

Keywords: α-Tocopheryl phosphate, Vitamin E, Phosphorylation

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Oral – [A-10-1386-1]
Green tea and autoimmune disorders: Impact on pathogenesis and the underlying mechanisms
Simin Nikbin Meydani
Immunology Laboratory, Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University
E-mail address: simin.meydani@tufts.edu

Green tea and its active ingredient, epigallocatechin-3-gallate (EGCG), have been shown to improve symptoms and reduce the pathological changes in some animal models of autoimmune diseases. T cells, particularly CD4+ T helper (Th) cells, play a key role in mediating many aspects of autoimmune diseases. Upon antigen stimulation, naive CD4+ T cells proliferate and differentiate into different effector subsets characterized by the production of specific cytokines and effector functions. Th1 and Th17 cells are the pro-inflammatory subsets of Th cells and are responsible for inducing autoimmunity whereas regulatory T cells (Treg) have a protective effect. We conducted a series of studies to determine the efficacy of EGCG in reducing pathogenesis of autoimmune disorders and the underlying mechanisms utilizing normal as well as an animal model of human multiple sclerosis, i.e., experimental autoimmune encephalomyelitis (EAE). First, we investigated the effect of EGCG on CD4+ T cell proliferation and differentiation in C57BL/6 mice. We observed that EGCG inhibited CD4+ T cell expansion in response to either polyclonal or antigen specific stimulation. We then determined how EGCG affects naive CD4+ T cell differentiation and found that it impeded Th1 and Th17 differentiation but promoted Treg development. In the presence of transforming growth factor-β, interleukin (IL)-6 promoted Th17 and...