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FACULTY OF PHARMACY**



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**BOOK OF ABSTRACT**

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T.C.  
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serum albumin as standard. Statistical analysis was performed using SPSS 10.0 for windows software. The obtained data were presented as mean  $\pm$  SE (standard error) unless otherwise specified. The differences were considered as statistically significant when  $p < 0.05$ .

## RESULTS AND DISCUSSION

SOD activities were found in Group I, Group II and Group III as  $86.62 \pm 10.81$  U/mg protein,  $81.92 \pm 11.54$  U/mg protein and  $51.93 \pm 8.46$  U/mg protein in liver tissue and  $53.27 \pm 6.49$  U/mg protein,  $49.27 \pm 6.06$  U/mg protein and  $34.2 \pm 5.88$  U/mg protein in kidney tissue, respectively. Catalase activities were found in Group I, Group II and Group III as  $56.22 \pm 6.27$  U/mg protein,  $51.07 \pm 7.42$  U/mg protein and  $24.01 \pm 4.31$  U/mg protein in liver tissue and  $44.02 \pm 7.81$  U/mg protein,  $45.91 \pm 8.11$  U/mg protein and  $22.2 \pm 4.06$  U/mg protein in kidney tissue, respectively. GSH levels were found in Group I, Group II and Group III as  $0.81 \pm 0.06$   $\mu\text{mol/mg}$  protein,  $0.84 \pm 0.06$   $\mu\text{mol/mg}$  protein and  $0.53 \pm 0.04$   $\mu\text{mol/mg}$  protein in liver tissue and  $0.67 \pm 0.08$   $\mu\text{mol/mg}$  protein,  $0.66 \pm 0.09$   $\mu\text{mol/mg}$  protein and  $0.41 \pm 0.06$   $\mu\text{mol/mg}$  protein in kidney tissue, respectively. MDA levels were found in Group I, Group II and Group III as  $91.06 \pm 10.04$  nmol/mg protein,  $94.04 \pm 10.47$  nmol/mg protein and  $147.83 \pm 19.61$  nmol/mg protein in liver tissue and  $78.71 \pm 12.63$  nmol/mg protein,  $76.81 \pm 11.87$  nmol/mg protein and  $106.93 \pm 8.08$  U/mg protein in kidney tissue, respectively. The electromagnetic field led to a significant increase in malondialdehyde (MDA) levels and significant decrease in SOD and CAT levels in the liver and kidneys tissue of rats ( $p < 0.05$ ). There was no significant difference in GSH levels in the same tissues ( $p > 0.05$ ).

## CONCLUSIONS

In conclusion, electromagnetic field emitting from mobile phone might produce impairments in some oxidative stress parameters in the liver and renal tissue of albino rats.

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## P-151: INFLUENCE OF SUBLETHAL CHLORPYRIFOS EXPOSURE ON OXIDATIVE STRESS AND ACETYLCHOLINESTERASE ACTIVITY IN CARP (*CYPRINUS CARPIO*)

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## INTRODUCTION

The commonly used pesticides in agriculture may react with macromolecules and may cause enzyme inactivation and DNA damage. Furthermore, they may also initiate peroxidation of poly-unsaturated fatty acids (PUFA) due to their deposition in fatty tissues by the generation of reactive oxygen species (ROS) as by-products. In the course of these events they can lead to oxidative stress. The objective of our study was to determine the oxidative and neurotoxic potential of sub-lethal concentrations (0.26 ppm and 0.52 ppm) of chlorpyrifos which is extensively used as a pesticide in Turkish agriculture in brain tissue at the 96<sup>th</sup> and 240<sup>th</sup> hours.

## MATERIALS AND METHODS

In order to detect the levels of oxidative stress in brain tissue, glutathion levels were detected by using superoxide dismutase possessing antioxidant features. Moreover, malondialdehyde (MDA) levels and acetylcholine esterase (AChE) levels were examined for the determination of levels of lipid peroxidation and neurotoxic effect, respectively. Acetylcholine esterase activity in cerebral cortex was performed by utilizing the spectrophotometric method of described by Ellman, Courtney, Andres, and Featherstone. The levels of tissue lipid peroxidation products such as thiobarbituric acid (TBA)-malondialdehyde (MDA) adducts were measured spectrophotometrically by the method described by Yagi. Virtually, all of the nonprotein sulfhydryl compounds of tissue were existing in the form of GSH. 5,5' Dithiobis (2-nitro benzoic acid) (DTND) is a disulfide compound readily which is reduced by sulfhydryl compounds that form a highly colored yellow anion by the method described by Beutler *et al.* The optical density of this yellow substance is measured at 412 nm. SOD activity was measured by the inhibition of nitroblue tetrazolium (NBT) reduction due to O<sub>2</sub> generated by the xanthine/xanthine oxidase system.

The contents of tissue protein were measured in accordance with the method developed by Lowry *et al.* by using bovine serum albumin as standard.

Statistical analysis was performed using SPSS 10.0 for windows software. The obtained data were

presented as mean  $\pm$  SE (standard error) unless otherwise specified. ANOVA and Tukey multiple range tests were used to analyze differences between the groups. The differences were considered as statistically significant when  $p < 0.05$ .

## RESULTS AND DISCUSSION

AChE, SOD and GST activities and GSH and MDA levels were shown in the table.

|                                    | Control<br>96 <sup>th</sup><br>hour | 0.26<br>ppm<br>96 <sup>th</sup><br>hour | 0.52<br>ppm<br>96 <sup>th</sup><br>hour | Control<br>240 <sup>th</sup><br>hour | 0.26<br>ppm<br>240 <sup>th</sup><br>hour | 0.52<br>ppm<br>240 <sup>th</sup><br>hour |
|------------------------------------|-------------------------------------|-----------------------------------------|-----------------------------------------|--------------------------------------|------------------------------------------|------------------------------------------|
| AChE<br>(U/mg<br>prt.)             | 0.14 $\pm$ 0.<br>02                 | 0.08 $\pm$ 0.<br>01                     | 0.06 $\pm$ 0.<br>01                     | 0.13 $\pm$ 0.<br>02                  | 0.07 $\pm$ 0.<br>01                      | 0.05 $\pm$ 0.<br>01                      |
| SOD<br>(U/mg<br>prt.)              | 41.17 $\pm$ 5<br>.22                | 38.11 $\pm$ 6<br>.23                    | 21.61 $\pm$ 5<br>.01                    | 40.23 $\pm$ 6<br>.17                 | 35.96 $\pm$ 5<br>.12                     | 22.3 $\pm$ 4.<br>74                      |
| GST<br>(U/mg<br>prt.)              | 38.24 $\pm$ 5<br>.67                | 34.52 $\pm$ 5<br>.74                    | 31.49 $\pm$ 6<br>.42                    | 35.04 $\pm$ 5<br>.01                 | 32.96 $\pm$ 6<br>.41                     | 17.04 $\pm$ 8<br>.43                     |
| GSH<br>( $\mu$ mol/<br>mg<br>prt.) | 0.08 $\pm$ 0.<br>01                 | 0.07 $\pm$ 0.<br>01                     | 0.04 $\pm$ 0.<br>01                     | 0.07 $\pm$ 0.<br>01                  | 0.07 $\pm$ 0.<br>01                      | 0.03 $\pm$ 0.<br>01                      |
| MDA<br>(nmol/<br>mg<br>prt.)       | 15.71 $\pm$ 4<br>.32                | 24.45 $\pm$ 7<br>.21                    | 29.1 $\pm$ 4.<br>04                     | 16.81 $\pm$ 4<br>.54                 | 18.26 $\pm$ 3<br>.51                     | 19.54 $\pm$ 3<br>.07                     |

AChE esterase activity was reduced in both concentrations over the time ( $p < 0.5$ ). MDA levels were increased at the 96<sup>th</sup> hour for both concentrations ( $p < 0.05$ ). The levels of SOD and GSH were elevated at the 240<sup>th</sup> hour for both concentrations ( $p < 0.05$ ). GST activity reduced at 240<sup>th</sup> hour for only the concentration of 0.52 ppm ( $p < 0.05$ ).

## CONCLUSIONS

We were able to observe an induced oxidative stress and significant inhibition of AChE in the brain tissues of *Cyprinus carpio* exposed to chlorpyrifos.

These findings manifest that sub-lethal concentration of chlorpyrifos leads to significant systemic toxicity in the brain tissues of *Cyprinus carpio*.

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## P-152: IRON STATUS IN ADOLESCENT GIRLS-RELATION TO OBESITY AND INFLAMMATION

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## INTRODUCTION

Obesity is associated with chronic low-grade inflammation [1]. Moreover, recent studies reported iron deficiency in overweight/obese adolescents [2, 3]. On the contrary, some other reports suggested that adiposity was sufficient to cause chronic inflammation but not to impair iron status [4]. Therefore, we aimed to determine some iron status biomarkers and to examine their potential association with anthropometric and inflammation parameters in normal weight and overweight/obese adolescent girls.

## MATERIALS AND METHODS

A cross-sectional study was performed in a primary care setting. A total of 22 overweight/obese adolescent girls (mean age 17.50 $\pm$ 1.34 years) and 16 age-matched normal weight controls were included. Biochemical and haematological parameters of iron status: serum iron, soluble transferrin receptor concentration (sTfR), transferrin, ferritin, red blood cell count (RBC), haemoglobin, haematocrit (Hct), mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH) and mean corpuscular haemoglobin concentration (MCHC) were measured. Inflammation was determined by high sensitivity C-reactive protein (CRP). Body weight and body height were obtained. Body mass index (BMI) z-score was calculated [5]. All the participants completed a questionnaire including dietary habits, somatic illnesses, medications use, and lifestyle habits. Adolescent girls younger than 16 years, and older than 19 years, as well as participants who had diabetes mellitus, renal, hepatic or thyroid dysfunction, cardiovascular disorders, with signs and symptoms of acute inflammatory disease and CRP > 10 mg/L, with a history of alcohol consumption and smoking, and those who used any medications were excluded from the study. Using the World Health Organization growth reference 5-19 years [5] adolescents were categorized as normal weight ( $-2SD \leq$  BMI z-score  $\leq$  +1SD), and overweight ( $+1SD <$  BMI z-score  $<$  +2SD) or obese (BMI z-score  $\geq$  +2 SD).

## RESULTS AND DISCUSSION

Overweight/obese girls displayed higher serum CRP, sTfR and ferritin levels ( $p < 0.001$ ,  $p = 0.013$  and  $p = 0.034$ , respectively), but lower MCHC ( $p = 0.008$ ) as compared with normal weight group. However, there was no difference in serum transferrin and iron level, RBC, hemoglobin, Hct, MCV and MCH between groups. In all girls, serum ferritin correlated positively with body weight and BMI z-score ( $p = 0.043$  and  $p = 0.030$ , respectively). sTfR correlated positively with body weight and BMI z-score ( $p = 0.023$  and  $p = 0.029$ , respectively), RBC ( $p = 0.005$ ), and negatively with MCV, MCH and MCHC ( $p = 0.011$ ,