9th Yazd International Congress and Student Award on Reproductive Medicine with 4th Congress of Reproductive Genetics

Poster Presentations

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Protective effect of vitamin E on sperm parameters, chromatin quality and DNA fragmentation in BALB/C mice treated with different doses of ethanol

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Background: Excessive consumption of alcohol induces increasing in oxidative stress production and can lead to detrimental effects in the male reproductive system.

Objective: The aim of the present study was to evaluate possible protective effects of co-administration of vitamin E, as a well-known antioxidant, on detrimental changes of sperm quality in mice intaken ethanol.

Materials and Methods: In this experimental study, 54 BALB/c mice were categorized into 9 groups (n = 6 /each). Group 1: The Control group received a basal diet. Groups 2, 5: Gavaged with 10% and 20% (V/V) ethanol (99% v/v, Merk, Germany) daily, respectively. Groups 3, 4: Gavaged with 10% (V/V) ethanol and injected with Vitamin E (Osveh Co., Iran) 100, 200 mg/kg intraperitoneally, respectively. Groups 6, 7: Gavaged with 20% (V/V) ethanol and injected with Vitamin E 100, 200 mg/kg intraperitoneally, respectively. Groups 8, 9: Received Vitamin E 100, 200 mg/kg intraperitoneally, respectively. The control group received basal diet and experimental groups including (alcohol 10% & 20%, alcohol 10% vit.E 100 & 200 mg, alcohol 20%/ vit.E 100 & 200 mg and vit.E 100 & 200 mg). After 35 days, the epididymis was dissected for analyzing sperm parameters include sperm motility, morphology, and viability. Sperm chromatin was assessed with Aniline Blue and Toluidine Blue staining. TUNEL assay was performed to evaluate the extent of DNA damage in spermatozoa.

Results: The results demonstrated a statistically significant reduction in motility rate ($p = 0.04$), normal morphology rate ($p < 0.0001$ and $p < 0.0001$, respectively), viability rate ($p < 0.0001$ and $p < 0.0001$, respectively), increase abnormal DNA structure and packaging Toluidine Blue staining ($p = 0.01$) and DNA damage (TUNEL) ($p = 0.04$) in ethanol consumer groups compared to the control. In addition, the findings showed a significant increase in the above-mentioned parameters in ethanol and vitamin E consumer group compared to the counterpart ethanol consumer groups. However, the extent of protamine deficiency Aniline Blue was not different in any experimental group compared to the control. The ethanol group received 20% of the most damage among the groups. The group receiving vitamin E 100 mg/kg and the group receiving ethanol 10% with vitamin 200 mg/kg gained the highest benefit among the groups.

Conclusion: Result showed that sperm forward progressive motility, normal morphology rate and viability decreased significantly in ethanol (10% and 20%) treated groups when compared with the control group also the rates of spermatozoa with abnormal DNA structure and DNA fragmentation increased significantly in the ethanol intake group than the control group. While, co-treatment with vit. E could prevent some of these adverse effects. Our findings in the current study revealed that co-administration of vitamin E and ethanol can protect destructive changes in DNA structure and damage.

Key words: *Ethanol, Sperm parameters, Vitamin E.*