

15th Euro Global Summit on

Toxicology and Applied Pharmacology

July 02-04, 2018 | Berlin, Germany

Protective effect of quercetin against sodium fluoride toxicity in testicular tissue

Semir Gul¹, Erman Erdemli² and Harika Gözükara Bag¹¹Inonu University, Turkey²Nigde Omer Halisdemir University, Turkey

Statement of the Problem: Sodium fluoride (NaF) is used in dental diseases, osteoporosis and medical imaging. However, it has been shown that excess fluoride intake causes toxic effects and damages on many organs and tissues. While the mechanism of toxic effect is not fully defined, studies on the male reproductive system have shown that NaF causes to oxidative stress, especially in Sertoli cells, in the testis tissue and cause to cellular damage. Quercetin (QR) is an oil-soluble antioxidant from flavonoid compounds and is commonly found in plants. Quercetin's best defined effect is the antioxidant property. Quercetin removes free radicals such as superoxide radicals produced by xanthine and xanthine oxidase and preserves intracellular components such as DNA and membranes. In present study we investigated the protective and ameliorative effects of QR over NaF toxicity in the testis tissue.

Methodology & Theoretical Orientation: Thirty two rats were randomly divided to 5 groups as follows: control (n=8), NaF (n=8, 25 mg/kg/day), QR (n=8, 25 mg/kg/day), NaF+QR (n=8, 25 mg/kg/day NaF and 25 mg/kg/day QR). After 28 days, testis organs were taken for biochemical, histopathological and electron microscopic evaluations.

Findings: There was no significant difference between the groups in terms of seminiferous tubule diameter. Degenerative cell masses were seen in the lumen of the seminiferous tubules in NaF group. Johnsen Scores for control, QR, NaF, NaF+QR groups are 9.6 ± 0.1 ; 9.7 ± 0.1 ; 5.1 ± 1.4 ; 6.4 ± 0.4 respectively. H score analysis of the immunoreactivity of caspase-3 among the groups; control: 75.7 ± 20.7 ; QR: 72.9 ± 18.0 ; NaF: 233.3 ± 51.6 ; NaF+QR: 106.7 ± 27.3 . All the results suggest that the quercetin play a protective role over the NaF toxicity in rat testis

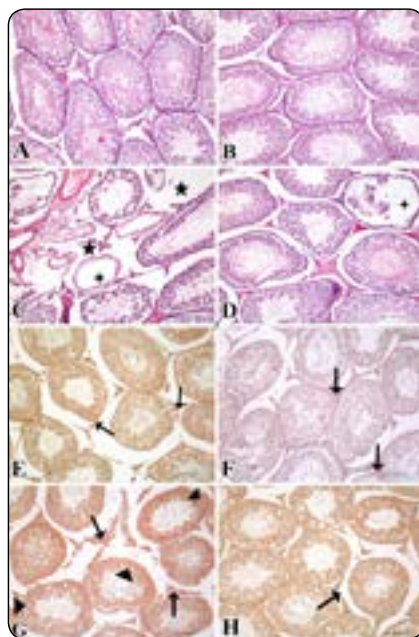


Figure 1: A, B, C, D: Hematoxylin-eosin (HE), 10x objective, scale bar: 100 μ m. A: Control, B: QR, C: NaF, D: NaF+QR. Five pointed stars: irregularity between tubules. Four pointed stars: loss of intra-tubule epithelium. E, F, G, H: Caspase 3 IHC staining, 10x objective, scale bar: 100 μ m. E: Control, F: QR, G: NaF, H: NaF+QR. Arrows: Caspase 3 positive staining of leydig cells. Arrow heads: Dense caspase 3 positive staining of seminiferous epithelium

Toxicology and Applied Pharmacology

July 02-04, 2018 | Berlin, Germany

Recent Publications:

1. Zhang J et al. (2016) Choline supplementation alleviates fluoride-induced testicular toxicity by restoring the NGF and MEK expression in mice. *Toxicol. Appl. Pharmacol.* 310:205-214.
2. Yang Y et al. (2015) Sodium fluoride induces apoptosis through reactive oxygen species-mediated endoplasmic reticulum stress pathway in Sertoli cells. *Journal of Environmental Sciences.* 30:81-89.
3. Johnsen S G (1970) Testicular biopsy score count: a method for registration of spermatogenesis in human testis. *Hormones.* 1(1):2-25.
4. Yang Y et al. (2014) Effects of N-acetylcysteine on fluoride-induced endoplasmic reticulum stress in sertoli cells. *Wei Sheng Yan Jiu.* 43(5):805-808, 813.
5. Moskaug J Q, Carlsen H, Myhrstad M, and Blomhoff R (2004) Molecular imaging of the biological effects of quercetin and quercetin-rich foods. *Mech. Ageing Dev.* 125(4):315-24.

Biography

Semir Gul is a PhD student in the Department of Histology and Embryology, Faculty of Medicine, Inonu University, Turkey and obtained his Master's Degree from the same university. He graduated from Molecular Biology and Genetics Department in 2010 from Izmir Institute of Technology, Turkey. His research interests are: toxicology, reproductive biology and developmental biology.

semir.gul@inonu.edu.tr

Notes: