

# 17<sup>th</sup> Global Toxicology and Risk Assessment Conference

Oct 22-24, 2018 Budapest, Hungary

## Effects of aluminium oxide nanoparticles on some blood parameters in female Wistar rats

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Nanoparticles (<100 nm) containing metals are being used various fields of technology and released to the environment, causing contamination of food supplies (1, 2, 3). Thus, the present work was undertaken to investigate the effects aluminum oxide nanoparticles ( $Al_2O_3$ ) sized 40 nm after its administration to female Wistar rats. Following 14 days oral administration of  $Al_2O_3$  nanoparticle (0, 0.5, 5, 50 mg/kg b.w./day), the levels of 19 serum biomarkers (glucose, cholesterol, creatinine, urea, triglycerides, bilirubin, protein, ALP, ALT, AST, cortisol, T3, T4, estradiol, prolactin, IgG, IgM, total oxidant, total antioxidant) belonging to different metabolic systems and the activities of osmoregulation enzymes (Na,K-ATPase, Mg-ATPase, Ca-ATPase) in the erythrocyte were measured. Except the lowest  $Al_2O_3$  dose, Na,K-ATPase activity (up to 76%) decreased significantly ( $P<0.05$ ) following  $Al_2O_3$  administrations, while  $Al_2O_3$  did not alter the activities of Mg-ATPase and Ca-ATPase in the erythrocytes.  $Al_2O_3$  administration caused an increase (167%) in the levels of total oxidants in the serum, while total antioxidant levels were not altered by  $Al_2O_3$ . The levels of the liver enzymes, ALT and AST did not change significantly, while ALP levels increased (58%) following  $Al_2O_3$  administration. The levels of the immune system parameters (IgM, IgG) did not change significantly. The levels of estradiol and T3 decreased (up to 83 %) significantly, while the levels of prolactin, cortisol and T4 did not change significantly. An increase (240 %) in bilirubin level and a decrease (73%) in triglyceride level were also noted in the serum of  $Al_2O_3$  administrated rats. The present study was supported by previous works (4, 5) which demonstrated the toxic effects of NPs.

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