

# Protection against Neurobehavioral Changes Induced by Bisphenol A during Development in Rats

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## Abstract

Bisphenol A (BPA) is an environmental estrogenic pollutant it's utilized in the manufacture of plastic products including beverages, dental materials and baby bottles. Exposure to BPA is unavoidable and recognized as major public health risk particularly in developing countries. Critical effects of BPA toxicity mostly occur during fetal development and postnatal development. Zinc (Zn) is an important element for the endogenous enzymatic antioxidant processes. it's required for cell proliferation, differentiation, normal growth, immune functions and wound healing. Selenium (Se) is additionally nutritionally essential element with antioxidant potential. It

protects brain from oxidative damage in various models of neurodegeneration. Objective: to research the influence of postnatal BPA exposure during lactation on the neonates of exposed rats also on investigate and compare the possible protective role of Zn and/ or Se against postnatal BPA- induced developmental and neurobehavioral alterations. Methods: Lactating dams were divided into 5 groups (8 rats/ each). Dams received daily for 21 days (from parturition until weaning) the following: Saline (1 ml/kg, P.O) for control and BPA (40 mg/kg, P.O) either alone or together with Zn (20 mg/kg, P.O), Se (0.1 mg/kg, P.O) or both of them. All pups were daily evaluated for physical development and for neurobehavioral development. The performance in behavioral experiments as Neonatal T-maze and Open-field test (OFT) was also examined. Brain homogenates were went to evaluate monoamines level (DA, NE and 5-HT) and oxidative stress markers (SOD, GPX and CAT). Results: Postnatal BPA exposure induced significant prolongation within the time of appearance of downy hair, fur development, ear opening, righting reflex, cliff avoidance, negative geotaxis 25°, palmar grasp and auditory startle in rat pups. BPA also showed significant reduction within the number of correct choices in T-maze also as in ambulation frequencies in OFT while showed significant elevation in rearing frequencies and latency time of rat pups. There was also significant reduction within the brain oxidative stress markers (SOD, GPX and CAT) also as in NE and 5-HT additionally to significant elevation in DA content.

**Note:** This work is partly presented at 15th International Conference and Exhibition on Alzheimers Disease, Dementia, September 27-28, 2021 held at Dublin, Ireland