Institute of Experimental Morphology, Pathology and Anthropology with Museum
Bulgarian Anatomical Society

Acta morphologica et anthropologica, 26 (1-2)
Sofia ● 2019

Brain Morphological Changes in Immature Mice after Perinatal Exposure to Cobalt Chloride

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Abstract

Over the last years, human activities have considerably increased the levels of cobalt (Co) in the environment. Cobalt overexposure is associated with serious health risks, especially in children. The aim of the present study was to examine the effects of perinatal Co treatment on the brain morphology in immature mice. Eighteen-day-old mice were subjected to cobalt chloride ($CoCl_2$) exposure 2-3 days prior to birth and during the postnatal period. The histopathological studies revealed substantial cerebral and cerebellar damage with features of neuronal necrosis compared to the age-matched healthy controls. In the cerebrum, the neurons, glial cells and the neuropil were affected, as well the Purkinje cells in the cerebellum.
The results are indicative of the enhanced susceptibility of the immature brain to the exposure of cobalt. They contribute to the elucidation of the neurotoxic potential of the metal and the related health risks in newborns and infants, especially in regions with cobalt pollution.

Key words: cobalt chloride, immature mouse brain, morphological changes