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Evaluation of apoptotic, pathomorphological and biochemical findings in congenital hypothyroidism induced by methimazole in rats

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Thyroid hormones (THs) has an important role in morphogenesis and neuronal development for mammalian and nonmammalian brain. In infants, partial or complete loss of thyroid function causes congenital hypothyroidism characterized by retarded neuronal migration, neuropil deficit, Purkinje cells destruction can be also seen in congenital hypothyroidism. Apoptosis (programmed cell death) is a well known mechanism that cause pathomorphological changes in central nervous system in congenital hypothyroidism. The activation of caspase proteases, especially caspase-3 and caspase-9, mainly leads to fragmentation of DNA in nuclei and other cellular structures and is essential for apoptosis. Although the roles of caspase-3 and caspase-9 in neurologic changes caused by congenital hypothyroidism are not fully understood, it was reported that they take in place in the process of different neurologic events. In the study, caspase-3 and caspase-9 expressions and DNA *in situ* fragmentation activities were evaluated in central nervous system of developing rat with congenital hypothyroidism. H&E and Kluver-Barrera staining showed neuronal degeneration and demyelination. Neuronal degenerations in front and mid brain were dense. Demyelination were more widespread in 10 day old rat pups. Caspase-3 and -9 positivities were strictly found in layers of cerebral cortex and hippocampus and stratum granulare and gangliosum cells of cerebellum in all pups. Oligodendroglia and astroglia were remarkably positive in 30 day old pups. Caspase-9 positivities were attended in also neurons of thalamus, medulla oblongata. TUNEL positivities in 30 day old pups were as commonly as that of caspases. The results showed neuronal degeneration were more extent in cerebrum during one third of postnatal period. Substantia grisea and alba of cerebrum-cerebellum and also m.oblongata and pons were widely effected in first month of life.

Biography

Mehmet Eray Alcigir has completed his PhD thesis in Department of Pathology, Faculty of Veterinary Medicine, Ankara University in 2011. PhD Thesis: "Evaluation of The Pathomorphological, Immunohistochemical Findings and *In-situ* PCR in Experimental Adenovirus Infections in Chickens". His main areas have been about neoplasia, genital system and central nervous system disorders and experimental diseases in laboratory animals. He has been having many experiences on immunohistochemical methods, *in-situ* PCR and chromogenic ISH. He has been working as Doctor since 2012. He is also responsible for Administrator in Department of Animal Welfare of Laboratory Animal Unit, Faculty of Chemistry and Faculty of Science, Ankara University.

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