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PATHOBIOLICAL EXPRESSION OF THE BRAIN-DERIVED NEUROTROPHIC FACTOR (BDNF) IN CEREBELLAR CORTEX OF SUDDEN FETAL AND INFANT DEATH VICTIMS

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HIGHLIGHTS

- BDNF is involved in development of the cerebellar cortex.
- BDNF-immunoexpression was evaluated in 45 cases of sudden perinatal death.
- BDNF immunonegativity was mainly highlighted prevalently in posterior cerebellar cortex of many SIUDS an SIDS.
- These results were related to maternal smoking.
- A pathogenetic mechanism of the unexplained death was proposed.

ABSTRACT: Brain-derived neurotrophic factor (BDNF), a neurotrophin of the central nervous system, is able to regulate neuronal differentiation and modulate synaptic plasticity, being particularly involved in the development of the cerebellar cortical structure. The main aim of this study was to delineate, by immunohistochemistry, the BDNF expression in human cerebellar cortex of victims of fetal and infant death. The study was performed on a total of 45 cases, aged between 25 gestational weeks and 6 postnatal months, including 29 victims of sudden fetal and infant death and 16 age-matched subjects who died of known causes (controls). We observed, in sudden death groups, compared with controls, a significantly higher incidence of defective BDNF expression in granule layers of the cerebellar cortex, which was particularly evident in the posterior lobule, a region that participates in respiratory control. These results were related to maternal smoking, allowing us to speculate that nicotine, in addition to the well-known damages, can exert adverse effects during cerebellar cortex development, in particular in hindering the BDNF expression above all in the posterior lobule. This implies modifications of synaptic transmission in the respiratory circuits, with obvious deleterious consequences on survival.
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