

Original Article

Maternal geophagy of calabash chalk and the developing cerebral cortex

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ABSTRACT

Calabash chalk geophagy is a common practice by pregnant women and children. Research has shown adverse maternal cerebral cortical effects following administration, hence, consumption of this chalk may also affect the nervous system developmental processes. This study therefore investigated the effect of maternal geophagy of the chalk on the developing cerebral cortex. Twelve gestating female Wistar rats were divided into two groups of 6 rats each. Animals in control group received placebo distilled water, while the test group animals received 200 mg/kg body weight of calabash chalk suspension orally on days 7-20 of gestation. On day 21, the dams delivered normally, and this marked post-natal day 1 (PND1). The pups were culled to four pups per mother (24 pups per group). On PND4-7 and PND7 respectively, surface righting reflex and cliff avoidance tests were carried out. On PND8 and PND15 respectively, twelve pups each per group were sacrificed after chloroform anaesthesia, and the brains were removed and preserved. Each cerebral cortex was excised and processed for histological study. There was no difference in pups body weights, and cliff avoidance and surface righting tests. The section of the cerebral cortex of PND8 pups in the calabash chalk group showed hyperplasia of cells in the entire cortical layers, while PND15 pups showed less cellular density and size of cells in the cortical layer. There was less Nissl substance staining in both chalk groups, however, the PND15 pups also showed chromatolytic cells compared with control group. In conclusion, maternal calabash chalk geophagy showed gradual cerebral cortical cell death processes which may lead to limitation of its functions.

Keywords: Calabash chalk, pups, Nissl staining, cerebral cortex, Wistar rat