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**Original Article**

**Gestational nicotine exposure alters oligodendrocyte morphology and axonal myelination in the lateral prefrontal cortex of young wistar rats**

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**ABSTRACT**

Prenatal exposure of the foetus to chemical insults has implications on the overall growth and development of the baby before and after birth. This study examined the effects of prenatal exposure to nicotine on the morphology of oligodendrocytes which are responsible for the development of myelin in the central nervous system, and are critical in neurodevelopment. Twenty adult female Wistar rats were used for the study. Their oestrous cycle was determined by vaginal smearing, and subsequently exposed to male rats for mating. The female Wistar rats were thereafter grouped into two and each group was further subdivided into a saline-treated control and a nicotine-treated subgroup. Each treatment lasted 5 consecutive days between days 9-13 (Group A) and days 16-20 (Group B) of pregnancy. The pups were allowed to grow and, at postnatal day 15, were euthanized and perfusion-fixed transcardially. The lateral prefrontal cortex was processed for histochemical, immunohistochemical and electron microscopic studies. Findings indicated marked decrease in oligodendrocyte count, reduced expression of myelin basic protein (MBP), and impaired myelin formation. These changes can affect the normal growth and development of the brain with severe implications on cognitive and motor functions after birth.

Keywords: Gestational nicotine, myelin, myelin basic protein, neurodevelopment, lateral prefrontal cortex, oligodendrocytes