

# Nigerian Journal of Physiological Sciences

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Home > Vol 28, No 2 (2013) > **Omotoso**

## Morphological and neurohistological changes in adolescent rats administered with nicotine during intrauterine life

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### Abstract

Tobacco smoking has been linked to many preventable diseases affecting various organs and systems of the body, including the brain. The current study was conducted to demonstrate the histological changes observable in the cerebral cortex of young Wistar rats exposed to nicotine during gestation. Vaginal smearing was conducted for the female Wistar rats to determine their oestrous cycle, after which they were exposed to male rats overnight, for mating. Pregnancy was confirmed and the pregnant rats were divided into 3 groups based on the 3 trimesters (A, B, C), with each group having a control and a treated subgroup. The Control Groups (A1, B1, C1) were given 0.1 ml of normal saline i. p., while the Treated Groups (A2, B2, C2) received 0.06 mg/kg/0.1 ml of nicotine intra-peritoneally. Treatment was for a period of 6 days only within each trimester for all subgroups. The pregnant animals were allowed to litter, and at postnatal day 35 they were sacrificed. The skull was dissected to expose and remove the brain; the temporal and parietal cortices were excised and fixed in 4% paraformaldehyde for histological tissue preparation, using cresyl fast violet staining techniques. Exposure of the developing brain to nicotine during gestation resulted in various degrees of abnormalities in the cytoarchitecture of the parietal and temporal cortices of young rats. The gestational period of nicotine exposure and specific cortical affectation are important factors to consider while investigating neurological abnormalities in offspring of tobacco smokers.

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