MATERNAL AND DEVELOPMENTAL TOXICITY EFFECTS OF ACUTE XYLENE EXPOSURE IN SPRAGUE DAWLEY RATS

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Introduction: Xylene is widely used in medical laboratories and is considered a safe alternative to benzene. Nevertheless, concerns have been raised about the effects of xylene exposure at the ambient level on pregnant lab personnel. Therefore, this study aimed to investigate the toxicity effects of xylene on maternal and foetal parameters.

Methods: Sprague Dawley rats (8-week-old) (n=6 per group) were treated with 100, 500 and 1000 ppm of technical xylene via intraperitoneal injection from gestational day (GD) 6 until GD17, followed by caesarian section at GD21. The samples were weighed, examined, fixed and stained with Haematoxylin & Eosin, Von Kossa and Periodic Acid Schiff for further analysis.

Results: 1000 ppm-treated group showed a significant ($p<0.05$) decrease in maternal body weight (BW), corrected weight gain and food intake, and increased intrauterine deaths (11/277). All xylene concentrations caused a significant ($p<0.05$) decrease in the placental weights of the male foetuses. However, only placentae of the 1000 ppm-treated group ($p<0.01$) were affected in females. Moreover, male and female foetal BW was significantly ($p<0.01$) reduced in 500 and 1000 ppm-treated groups. This is consistent with an increased count of glycogen cells in placentae of the same groups. Histological examination also revealed marked uterine inflammation and necrosis in the xylene-exposed dams.

Conclusion: Xylene exposure during vulnerable gestational period can adversely affect pregnant rats and foetuses via in-utero inflammatory responses, of which the foeto-placental dynamic was affected. The research findings can be adapted to improve our current guidelines to safeguard maternal and foetal wellbeing during pregnancy.

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