



Abstract

The widespread use of pesticides leads to severe environmental pollution and health hazards. Long exposure of pesticides is known to cause teratogenicity, malignant tumor, immunosuppressive action, neurological syndromes, abortion and decreased fertility in animals. Epidemiological study revealed that pyriproxyfen could be implicated in the increased incidence of microcephaly associated with Zika virus (ZKV) infection during pregnancy. So, the aim of the present is to investigate the neurotoxic effects of pyriproxyfen on pregnant female mice. In this study, thirty pregnant female mice were divided into five groups received the different doses 1000, 300, 100, 30, 0 mg/kg of pyriproxyfen during 7 - 17 days gestation period. The weights of gravid female (throughout gestation period) as well as their pups' (for six weeks) were recorded. At the age of 6th week, brains were dissected out and the brain and relative brain weights of male and female pups were measured. In addition, neuronal tissue architecture was examined by Hematoxylin and Eosin (H & E) staining. Furthermore, quantitative analysis includes cortical radial thickness by H & E staining and total neuronal cell number were calculated through immunohistochemical staining using NeuN antibody. The results showed a less weight gain in treated female mice during gestation period while a significant increase ($p < 0.05$) in the body of treated pups as compared to control was observed. There was a significant decrease ($p < 0.05$) in relative brain weights at 100, 300 and 1000 mg/kg in both male and female pups. Histopathological changes revealed pyriproxyfen treatment highly damaged the neuronal architecture by necrosis, vacuolization and reactive gliosis in all groups as compared to control. Inflammation and fibrally debris were observed at 300 and 1000 mg/kg respectively. Quantitative analysis showed a significant decrease ($p < 0.05$) in the cortical radial thickness and total neuronal cell number at highest doses (300 and 1000 mg/kg) in male and female pups. So, it is concluded that the use of chemicals should be strictly avoided during pregnancy and early developmental stages because these are highly vulnerable to develop life time malformation in neonates. Therefore, the application of chemicals should be limited to a designed program with special care in handling to minimize its hazardous effects.