

NEUROCHEMICAL MODULATION AND BEHAVIOURAL CHANGE AFTER NEONATAL ADMINISTRATION OF PYRETHROIDS IN ANIMAL MODEL

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Introduction: pyrethroids are a class of insecticides involved in different neurological disorders. The aim of the present work was to investigate in rats the long-lasting effects after developmental exposure from the 6th (PND6) to the 15th day of life (PND15) to type I (permethrin, PERM) or type II (cypermethrin, CY) pyrethroids at a dose of 1/10 of DL₅₀. Subsequently, open-field behaviours as well as striatal monoamine levels in adulthood were examined. In addition, in an attempt to assess whether pyrethroids can cause oxidative stress in striatum, and to shed some light on the mechanisms involved in the reported neurotoxicity of pyrethroids, we examined the effect of both pyrethroid types on plasma membrane fluidity, lipid peroxidation, protein oxidation in striatum of rats. **Materials and Method:** wistar rat pups (30 litters) born in our laboratory, from primiparous dams, were used. Litters were randomly assigned to three experimental groups (10 litters for each). CY and PERM were dissolved in corn oil and administered orally (5 ml/kg) and the doses were 1.49 mg/kg and 34.05 mg/kg, respectively. The compounds were administered once a day in the morning from PND6 to PND15. Control rats were treated with corn oil on a similar schedule. At PND21 and PND35, ten rats of each group (CY, PERM and control) were submitted to the open field test to quantify behavioural activity. The behavioural parameters observed were locomotion, rearings, stereotype counts and the number of entries into the central square of the arena. On PND35, ten animals from each group (PERM-treated, n=10; CY-treated, n=10; control rats, n=10) were sacrificed and striatum were dissected out and stored at -80°C until use. For the behavioural and biochemical experiments, the groups of animals were formed by drawing animals from different litters. DA and its metabolites DOPAC and HVA, from striatum of each animal were measured by HPLC system using the method of Alburges (1). The samples of striatum were homogenised and a modification of the method of Lenz et al. (2) was used for measurement of protein carbonyls. The lipid peroxidation was measured by the Koning method (3) on lipids extracted. **Results and Discussion:** open field studies showed increased spontaneous locomotor activity in the groups treated with PERM and the one treated with CY. Lower dopamine, higher homovanillic acid levels and carbonyl group formation were measured from both treated groups. No changes in lipid peroxidation and fluidity at different depths of plasma membrane were measured. Our studies suggest that neonatal exposition to a low dose of pyrethroids induces long-lasting effects by altering dopaminergic activity. We hypothesize that the increased levels of dopamine oxidation products on striatum could explain the protein damage.

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