Nicotinamide prevents the long-term effects of perinatal asphyxia on basal ganglia monoamine systems in the rat

Bustamante, D.

Goiny, M.

Åström, G.

Gross, J.

Andersson, K.

Herrera-Marschitz, Mario

Asphyxia during birth can cause gross brain damage, but also subtle perturbations expressed as biochemical or motor deficits with late onset in life. Thus, it has been shown that brain dopamine levels can be increased or decreased depending upon the severity of the insult, and the region where the levels are determined. In this study, perinatal asphyxia was evoked by immersing pup-containing uterus horns removed by hysterectomy in a water bath at 37°C for various periods of time from 0 to 20 min. After the insult, the pups were delivered, given to surrogate mothers, treated with nicotinamide, further observed and finally, 4 weeks later, killed for monoamine biochemistry of tissue samples taken from substantia nigra, neostriatum and nucleus accumbens. The main effect of perinatal asphyxia was a decrease in dopamine and metabolite levels in nucleus accumbens, and a paradoxical increase in the substantia nigra. Nicotinamide (100 mg/kg i.p., once a day for 3 days, beginning 24 h after the