

TERATOGENIC ACTION OF ALCOHOL

Wanda Dyr

Zakład Farmakologii i Fizjologii Układu Nerwowego
Instytut Psychiatrii i Neurologii w Warszawie

TERATOGENIC ACTION OF ALCOHOL

ABSTRACT – Maternal alcohol drinking might be deleterious to the developing fetus. At present, studies concentrate more on the teratogenicity of alcohol *per se* than conditions associated with chronic alcoholism. Severity and nature of behavioral alterations varies markedly among children of women who drink during pregnancy. One important determinant of this variation may be genetic differences in the response to alcohol. In animal studies, the high-alcohol-sensitive (HAS) and low-alcohol-sensitive (LAS) rats were used to study the consequences of developmental alcohol exposed to 6.0 g/kg/day on Postnatal Days (PD) 4-9, a period of brain development equivalent to the third trimester. Ethanol-exposed HAS rats were more impaired on the motor coordination task compared with LAS rats. There were no differences in peak blood alcohol level between the lines, indicating that vulnerability to ethanol's teratogenic effects was not due to differences in metabolic rate. These results suggest that genetic differences in response to alcohol may serve as a predictor for susceptibility to ethanol's teratogenic rate.

The dose-dependence of the effect of maternal alcohol on hippocampal c-Fos expression was examined in infant rats. The results have been shown that expression of c-Fos in the hippocampus is decreased following treatment with alcohol in a dose-dependent function. This finding can be suggested that suppression of c-Fos expression in the hippocampus of infant rats with maternal alcohol administration mediates the associated developmental retardation and anomalies.

Risk factors directly or indirectly affect mechanisms of alcohol teratogenesis. Anomalies associated with FAS may arise from excess oxygenated free radicals that can severely damage neural cells. Fetal alcohol exposure increased levels of lipid peroxidation in all brain areas measured in rats, including neocortex, hippocampus and cerebellum.

Animal models should continue to be productive in increasing our understanding of teratogenic mechanism of action of alcohol.

Key words: teratogenic action of alcohol, animal models, c-Fos, ethanol.