The role of TGF-β1 in the development of fetal alcohol syndrome (FAS)

Zh. Malakhova, Russian Federation

The poor results of all anti-alcohol programs creates a chain of other problems. However, none of them is as burning as female alcoholism and, consequently, the development of FAS in their children. The study aimed at identifying possible differences in the TGF-β1 content in the blood serum of pregnant women who abuse alcohol and who do not. Twenty-nine pregnant women were examined. Of these, 1st group (the main group) included 8 women (with a history of alcohol addiction), and 2nd (control) group of 21. The determination of the TGF-β1 level was performed during 11th-14th weeks of pregnancy. Due to the peculiarities of the examined women pregnancy period (gestosis, extragenital pathology and gynecological diseases), a parallel study of TGF-β1 in rats was conducted. The investigations were carried out in the autumn-winter period on 26 1-2-month-old Wistar rats, weighing 280-300 g. They were divided into two groups: 1 - main (13 animals receiving 15% alcohol solution instead of water for 1 month before pregnancy and during the entire pregnancy), 2 - control (13 intact rats). To determine TGF-β1, a heterogeneous solid-phase enzyme-linked immunosorbent assay (Rat-TGF-β1 ELISA test system BMS623 and BMS623TEN, Bender MedSystems, Austria) was used. The number of TGF-β1 in the 1st group of women was 71.7 ng/ml, 8.8 ng / ml ($t = 1.94$, $p < 0.05$) in the second. The reference values of TGF-β1 0 - 3.46 ng/ml. The experiment on rats also resulted in statistically significant TGF-β1 value differences: in the experimental group M = 187.9 ng / ml, in the control group m = 129.7 ng / ml, $t = 2.68$, $p < 0.02$. An increase in TGF-β1 concentration in women who took alcohol during pregnancy and a similar trend in alcoholized pregnant rats allow to say that the existing receptor block to the growth factor is associated with ethanol influence. Based on these provisions, it becomes possible to explain the complex of clinical data peculiar to newborns with FAS: intrauterine growth retardation, facial deviations, changes in the central nervous system.

Recent Publications

1. Malakhova Zh., Efremov A. (2014) Fetal alcohol syndrome: pathogenetic bases. Narcolodgy 11: 74-83.
2. Malakhova Zh., Efremov A. (2014) The brain damage in fetal alcohol syndrome. Medical and Health Science J. 15: 65-68.
3. Yakusheva M., Efremov A., Malakhova Zh. (2014) Fetal alcohol syndrome as a result of prenatal alcohol exposure. Bulletin of the Ural Medical Academic science 3: 226-229.
4. Malakhova Zh., Yakusheva M., Bubnov A. (2016) Fetal alcohol syndrome: search for new diagnostic markers. Narcolodgy 2: 34-37.
5. Malakhova Zh., Perminova L., Muts E. (2018) Guidelines " Children with very low and extremely low birth weight-outpatient monitoring stage", 78 pp., Kaliningrad.