

Chromosomal abnormalities and programmed cell death in patients with psychoactive substance dependence

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Changes in gene expression in brain reward regions are thought to contribute to the pathogenesis and persistence of drug addiction. Cytological examination has routinely been used for several decades as a tool to monitor occupational and environmental exposure to agents known to damage DNA, thereby causing mutations, which can result in cancer (genotoxins). This study considers the evidence suggesting that chronic exposure to drug addiction might be genotoxic.

Peripheral blood lymphocytes are studied for the presence of biomarkers that may be associated with persistence and chronicity of drug use and the addictive state. Subjects: 62 subjects were included in the study: 30 male psychoactive dependant inpatients diagnosed according to SCID criteria after subsidence of withdrawal symptoms, and 32 mentally healthy male volunteer relatives matched for age and sex. Method; Urine samples were taken from all subjects for urine analysis for substances of dependence was performed using the semi-quantitative ELIZA technique. Blood samples were drawn for cytogenetic analysis of lymphocytes after being incubated in the presence of PHA for 48 hours, then stained by special techniques to assess apoptosis and chromosomal aberrations.

There is an evident statistically significant difference between patients with psychoactive substance dependence and controls on three recorded cytogenetic lymphocyte findings in blood samples. Patients with drug dependence have higher degrees of programmed cell death, apoptosis, and (mean+ sd 5.48+ or-1.7 compared to (1.2+ or-0.93). Patients with addiction have a significantly higher number of micronuclei (9.1+ or-8-9) compared to normal controls (0.69 + or- 0.5). The mean number of chromosomal aberrations in the addict group was 3.94+ or-0.92 while in the control group was 2.39+ or-0.33.