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METHAMPHETAMINE-INDUCED CYTOTOXICITY IN HUMAN SEROTONERGIC CELLS

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Methamphetamine (METH) is a psychostimulant and has become popular recreational drug of abuse in many countries. The neurotoxic damage caused by METH is characterized by degeneration of the dopaminergic and serotonergic systems in striatum and hippocampus. Many studies have suggested the various mechanisms of METH neurotoxicity, such as dopamine release and subsequent enzymatic oxidation, dopamine auto-oxidation and mitochondrial disruption. And METH increases extracellular 5-HT levels in the brain, predominantly by releasing 5-HT from presynaptic terminals and by blocking uptake of 5-HT. However, the molecular and cellular mechanisms remain to be clarified. In this study, we intended to find out whether METH-induced neurotoxicity in human serotonergic JAR cells is related to apoptosis. METH was cytotoxic to human serotonergic JAR cells in MTT and LDH assay. Apoptotic bodies were found in Giemsa staining and TUNEL assay and DNA fragmentation was shown. METH decreased procaspase 3. These data suggest that METH induce apoptosis in human serotonergic cells and apoptotic pathways may be involved in METH-induced serotonergic neurotoxicity. We are going to determine the protein induction related to apoptotic mechanism.

Keyword : methamphetamine, JAR cell, apoptosis, serotonine