MDMA-Induced BV2 Microglial Cell Activation in Vitro

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Abstract

Background: 3,4-Methylenedioxymethamphetamine (MDMA) is a psychostimulant drug that induces neurotoxicity. Even though several psychostimulant substances activate microglia, little is known about MDMA's effects on these cells, and evidence of MDMA-induced microglial activation is equivocal. Materials and Methods: This study employed a murine microglial cell line, BV2, to examine the effects of MDMA on the microglia morphological changes and the survival of microglia in vitro. MDMA was incorporated into the media at the time of plating, and cell number and mitochondrial dehydrogenase activity (MTT) levels were determined in vitro. The level of pro-inflammatory cytokine TNF-α was also determined. Results: Treatment of BV2 cells with MDMA resulted in morphological changes, reduced cell viability after 24h incubation with the inhibitory concentration (IC50) value of 243.6 µg/mL, and increased TNF-α level in a dose-dependent manner. Conclusion: These findings proposed that MDMA could induce BV2 microglial cell activation in vitro and suggested that it has an essential role in developing MDMA use disorder. © The Author(s), 2022.

Author keywords

3,4-methylenedioxymethamphetamine; MDMA; Microglial activation; Neurotoxicity

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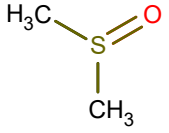

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