

Establishment of human neuroblastoma cell line (SK-N-SH) as an in vitro model of morphine addiction

ABSTRACT

The usage of morphine for analgesic purposes are widely known, usually for the post-operation procedure and as chronic pain management. However, addiction and overdose liabilities prior to morphine usage are also common. Morphine addiction is observed and studied from various perspectives; tolerance, dependence and withdrawal. With growing and expanding research field, researches on addiction were done using in vivo and in vitro model. However, the scientific evidence of morphine addiction using human neuroblastoma cell lines is uncommon. Thus, the present study was designed and conducted to observe the liability of SK-N-SH, as a model for morphine addiction. The cells were administrated with morphine for 24 hours before being treated with methadone. The cytosolic fraction of the cell was collected and used for determining the addiction mechanism. Data showed the involvement of the μ -opioid receptor in expressing the addictive properties of morphine. Exposure to 24-hours morphine had increased the protein level responsible for addiction and reduce the protein levels expressing the endocytic machinery, desensitisation of receptor and cellular adaptation. The altered proteins level was normalised by the treatment of methadone. The study proposed the use of SK-N-SH as an addiction model, as it showed morphine addiction and methadone anti-addiction properties.

Keyword: Cellular adaptation; Morphine addiction; Withdrawal properties; Internalisation