

2. Abstract

Opioids have been used as effective analgesics for many years. The worst problem is, however, their adverse effects and potential addiction. There are three known types of opioid receptors that differ mainly in their sensitivity to different opioids and their distribution in the CNS. This work also deals with apoptosis. Apoptosis is an important process not just in the embryonic development, e.g. for the right differentiation of fingers and toes, but also in the adulthood, e.g. to suppress tumour formation. Whereas an apoptotic pathway can be initiated in many different ways, there is only one mechanism that actually causes the death of a cell. It is important for the cell death and division to be in balance. The breach of this balance may result in pathologic effects. This work summarizes the effects of opioids in connection with apoptosis. The main object of the research of this relationship was morphine which has both pro-apoptotic and anti-apoptotic effects. Another two frequently investigated opioids are methadone and heroin. Heroin is mainly used in the studies researching the impact of this highly addictive opioid on the apoptosis and embryonic development.

Keywords: opioids, opioid receptors, G-proteins, apoptosis, morphine