INTISARI

Salah satu perubahan mekanisme epigenetik dalam patologi *brain disorder* adalah peningkatan jumlah enzim HDAC2 yang menyebabkan penurunan fungsi kognitif. Senyawa kurkumin diketahui mampu menghambat enzim HDAC1, HDAC3, HDAC8 pada sel kanker colorectal serta HDAC1 dan HDAC3 pada sel Raji. Nampaknya, senyawa kurkumin berpotensi mentarget enzim HDAC pada *brain disorder*, khususnya HDAC2 serta berimplikasi terhadap neurogenesis di otak. Namun, senyawa kurkumin memiliki kelarutan dan bioavailabilitas yang sangat rendah dalam tubuh, sehingga berpotensi diformulasikan dalam bentuk *Self Nanoemulsifying Drugs Delivery* (SNEDDS). Penelitian ini mengulas pengaruh kurkumin dan potensi nanoemulsinya sebagai terapi *brain disorder* baru yang ditinjau dari pengaruhnya terhadap enzim HDAC2 di otak serta potensi implikasinya pada ekspresi gen terkait neurogenesis (*Dcx* dan *Map2*). Google Scholar, PubMed, ScienceDirect, serta sumber lain digunakan untuk mencari artikel terkait topik yang akan diulas. Senyawa kurkumin terbukti mampu memperbaiki parameter *neurobehavioral* terkait kelimpahan HDAC2 pada *brain disorder*, seperti fungsi memori, kognisi, dan aktivitas lokomotorik yang kemudian dibuktikan oleh adanya aksi penghambatan kurkumin pada HDAC2. Selain itu, kurkumin diketahui mampu meningkatkan ekspresi gen neurogenesis (*Dcx* dan *Map2*) untuk memperbaiki fungsi kognitif dan memori pada *brain disorder*. Kemudian, formulasi SNEDDS kurkumin terbukti mampu memodifikasi pelepasan kurkumin sebagai sediaan lepas lambat (*sustained release*), meningkatkan permeabilitas semu membran, serta memperbaiki parameter farmakokinetika kurkumin, yang berpotensi sebagai pengembangan terapi untuk meningkatkan efikasi kurkumin pada *brain disorder*.

Kata Kunci : Kurkumin, *brain disorder*, HDAC2, *Dcx*, *Map2*, SNEDDS

ABSTRACT

One of epigenetic mechanism changed in the pathology of brain disorder is an increase in the amount of the HDAC2 which causes a decrease in cognitive function. Curcumin is known for inhibiting the HDAC1, HDAC3, HDAC8 in colorectal cancer cells and HDAC1 and HDAC3 in Raji cells. It seems that curcumin has potential to target the HDAC in brain disorders, especially HDAC2 and those implications for neurogenesis in the brain. However, the solubility and bioavailability of curcumin are very low in the body, and it is potentially to be formulated in Self Nanoemulsifying Drugs Delivery (SNEDDS). This study reviews the effect of curcumin and its potential nanoemulsions as a new brain disorder therapy in terms of its effect on the HDAC2 enzyme in the brain and its potential implications for gene expression related to neurogenesis (*Dcx* and *Map2*). Google Scholar, PubMed, ScienceDirect, and other sources are used to find articles related to the topic to be reviewed. Curcumin was shown to be able to improve the neurobehavioral parameters related to the abundance of HDAC2 in brain disorders, such as memory function, cognition, and locomotor activity as evidenced by the presence of curcumin inhibition in HDAC2. In addition, curcumin is known to be able to increase the expression of neurogenesis genes (*Dcx* and *Map2*) to improve cognitive function and memory in brain disorder. Then, the curcumin SNEDDS formulation has been shown to increase drug release, apparent permeability of the membrane, and improve the pharmacokinetic parameters of curcumin, which was potential to be developed as new therapy to improve the efficacy of curcumin in brain disorders.

Keywords: Curcumin, brain disorder, HDAC2, *Dcx*, *Map2*, SNEDDS