

Hypothalamic Neurogenesis Enhanced by Safflower Seed Oil, a Natural Source of Linoleic Acid

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Impaired adult neurogenesis has been associated with aging and neurodegenerative diseases. Recent studies indicated that new cells in the hypothalamus are affected by diet. On the other hand, WHO highlighted the importance of herbal medicine as their estimation imply that 80% of the world's population prefers to use herbal therapy safe and without side effects. Our previous in vitro study showed that Safflower Seed Oil (SSO), as a rich source of Linoleic Acid (LA; 73.64%), markedly increased both proliferation and differentiation of neural stem cells in vitro. In the present study, we translated our in vitro study to current in vivo study to study the effect of SSO on hypothalamic neurogenesis and then compare its potential with synthetic LA.

Method: Animals were divided into four groups (n =10 per group) as follows: (i) control mice (Ctrl); (ii) Vehicle mice (Vehicle), received an equal volume of solution containing 0.5% DMSO solvent (iii) synthetic linoleic acid -treated mice (300 mg/kg) (LA) and (iv) safflower seed oil -treated mice (407.4 mg/kg) (SSO) orally. after eight weeks animals sacrificed and removed brain for culture, Eliza and immunohistochemical analysis.

The results showed that administration of SSO for 8 weeks in adult mice leads to promotion in NSCs proliferation isolated from SSO treated mice, compared to vehicle. Quantitative data of immunofluorescent staining of hypothalamus showed though the frequency of astrocytes (GFAP+ cells) are not affected by LA and SSO, the frequency of immature (DCX+ cells) and mature (NeuN+ cells) neurons significantly increased in LA and SSO treated mice, compared to vehicle. Furthermore, it was observed that both LA and SSO causes a significant increase in the serum level of Brain-derived Neurotrophic Factor (BDNF). In all experiments SSO acted more potent than LA.

In conclusion, while LA and more effectively SSO increased the hypothalamic proliferation and neurogenesis. Give the importance of stimulating adults neurogenesis as well as the importance of herbal supplements in health, we introduce SSO as a potent herbal candidates to stimulate adult hypothalamic neurogenesis that also need further experimental and clinical study for further clarification of its mechanistic pathways.

Keywords: safflower seed oil; linoleic acid; neurogenesis; hypothalamus

Biography:

Amir Ghanbari graduated in anatomical sciences in PhD course in 2014 and currently works at the department of anatomy of Yasuj University of Medical Sciences of Iran. He do research on Neurosciences especially neural stem cells and neuro degenerative disease. One the his interest subject is the effect of nutrition on organ hemostasis and disease.