Effect of curcumin on memory impairment: A systematic review

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ARTICLE INFO

Keywords:
Curcumin
Memory
In vivo
Enhancement
Efficacy

ABSTRACT

Background: Memory impairment (MI) is one of the most common complaints of people referred to physicians for proper diagnosis. In addition, the prevalence of neurodegenerative lesions like Alzheimer is generally on the increase. Thus far, numerous laboratory studies have been conducted to evaluate the effect of curcumin on the improvement of MI.

Purpose: The aim of this study was to review the efficacy of curcumin on MI in animal studies.

Methods: Keywords related to memory and curcumin were searched in PubMed, Web of Science, and Scopus databases based on MeSH, and articles published until July 2017 were later extracted. Then the articles (full text or abstract) were examined based on the inclusion and exclusion criteria. The present study evaluated articles that did not include specific pathologies such as Alzheimer.

Results: A total of 90 articles met the inclusion criteria but only 25 articles underwent final review. The minimum and maximum dosages of curcumin were 5 and 480 mg/kg respectively. Curcumin was administered over the period of 1-84 days. The results of 24 articles showed that curcumin moderates short-term and long-term MI in various laboratory models such as aging, acute and chronic stress, anxiety, smoking, benzodiazepine and anticonvulsant consumption, and other conditions associated with increased oxidative stress.

Conclusion: The findings of this study revealed that curcumin moderated or reversed MI in rodents and did not have a placebo effect. Accordingly, curcumin can play a preventive and therapeutic role in MI.

Introduction

The memory is a cognitive process in the brain that encodes, stores, and reminds one of received information (Stern and Alberini, 2013). The memory plays an important role in learning and communication with the surrounding environment.

Complaint of memory impairment (MI) using terms like being forgetful, disturbance in concentration, leaving out the objects, etc., are common findings in adults which is classified as subjective memory impairment (SMI), and the underlying disease is not identified in most of these people (Blackburn et al., 2014; Ginó et al., 2010; Zuniga et al., 2016). In the absence of organic or psychological disease, MI has different etiologies which include being in stressful situations, feeling unwell, feeling depressed (Blackburn et al., 2014; Ginó et al., 2010; Zuniga et al., 2016), exposure to air and noise pollution (Sunyer et al., 2015; Trzian et al., 2015), the side effects of some drugs and substance abuse (Terrett et al., 2014; Thierec, 2001), life style such as tobacco use, high alcohol consumption (Hagger-Johnson et al., 2013; Nooyens et al., 2008), low physical activity (Blondell et al., 2014) and high fat diet (Boitard et al., 2014). It is also well observed that individuals with SMI are at increased risk of developing advanced stages of MI including mild cognitive impairment and dementia in the long run (Mitchell et al., 2014). A total of about 7% of the aged (older adult) in different societies suffer from dementia and there is no known definite treatment for it (Livingston et al., 2017; Prince et al., 2013).

Confronting MI causes and, from another glance, memory enhancement, can play an effective role in maintaining the performance of individuals. The identification of protective factors against MI also provides a new prevention and treatment window. Over the past years, special attention has been paid to the protective effects of curcumin on...