

Neuroprotective Effects of Pomegranate Juice in Mice

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ABSTRACT

A keen interest in therapeutic properties of pomegranate has prompted numerous *in vitro* and *in vivo* animal and clinical studies. However, not much work has been done on the psychopharmacological actions of pomegranate juice. Therefore, this study explore the neuroprotective potential of pomegranate juice in mice. A total of 204 Swiss male mice divided into 34 groups were employed in the present investigation. Pomegranate juice (10% v/v) showed significant improvement in the memory of young and aged mice, when tested in object recognition task model. The pomegranate juice also reversed the memory deficits induced by diazepam (1 mg/kg, i.p.), scopolamine (0.4 mg/kg, i.p.) and sodium nitrite (75 mg/kg, s.c.). Furthermore, pomegranate juice showed hypoglycemic effect in mice and increased brain reduced glutathione levels. The underlying mechanism of action for the observed memory enhancing effect of pomegranate juice could be attributed to its anti-oxidant and glucose lowering property. This study highlights the neuroprotective potential of pomegranate juice in various experimental models.

In the food industry, pomegranate is listed under a novel category of exotic fruits called 'super fruits'. Pomegranate juice is reported to possess several useful medicinal properties such as anti-carcinogenic, anti-inflammatory, hypolipidemic and anti-hypertensive (Jurenka, 2008). Alzheimer's disease (AD) is said to be the leading cause of dementia in elderly individuals. Alzheimer patients exhibit deterioration in cognitive functions rendering them incapacitated to perform normal daily activities (Parle and Kadian, 2009).

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Objectives :

The present study was undertaken to test the ability of mice to recognize various objects. Furthermore, the neuroprotective potential of pomegranate juice in reversing ageing induced amnesia, scopolamine/ diazepam/ sodium nitrite induced memory deficits were studied in mice. The effects of pomegranate juice on plasma glucose and reduced glutathione (GSH) levels in brains of mice were also investigated in this

study.

MATERIALS AND METHODS

Study was conducted to determine the optimum dose of pomegranate juice (PJ) and duration of administration. Pomegranate juice (10% v/v) was administered orally in mice for a duration of 12 days.

Animals:

All the experiments were performed using male Swiss mice procured from the Disease-Free Small Animal House of C.C.S. Haryana Agricultural University, Hisar. Young (3-4 months old) and aged (12-15 months old) animals were used in the present study. The experimental protocol was approved by the Institutional Animals Ethics Committee (IAEC) and the care of laboratory animals was taken as per the guidelines of CPCSEA, Ministry of Forests and Environment, Government of India (registration number 0436).

Memory deficits were produced in mice using drugs such as diazepam, scopolamine (Parle and Kadian, 2009) and sodium nitrite. Aged animals also served as memory compromised animals.

Sodium nitrite induced hypoxia model:

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Key words :

Pomegranate juice, Memory, Alzheimer's disease, Neuroprotective

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