

Abstract

Pomegranate Juice Ameliorates Dopamine Release and Motor and Olfactory Deficits in The Rotenone-Induced Rat Model of Parkinson's Disease [†]

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Abstract: Pomegranate juice (PJ) is a rich source of ellagitannins, precursors of the colonic metabolite urolithin A believed to contribute to pomegranate's neuroprotective effect. While many experimental studies involving PJ's role in Alzheimer's disease and hypoxic-ischemic brain injury have been carried out, our knowledge of pomegranate's effects against Parkinson's disease (PD) is very limited. Previously, we have reported that PJ treatment improved the postural stability, which correlated well with the enhancement of neuronal survival, protection against oxidative damage, and α -synuclein aggregation [1]. Since olfactory and motor deficits are typical symptoms of PD associated with a decreased density of nigral dopaminergic neurons, in this study, we aimed to investigate the capability of PJ for protecting the olfactory, motoric and neurochemical alterations. To evaluate its efficiency, Wistar rats were given the treatment with PJ in a dose of 500 mg/kg b.w./day (*i.g.*) and injected with ROT (1.3 mg/kg b.w./day, *s.c.*) from the 11th day. The experiment lasted a total of 45 days, including 10 days' pre-treatment with PJ and 35 days' combined treatment with PJ and ROT. After that, we assessed the olfactory discrimination index and vertical and horizontal activities as well as dopamine level in the dissected midbrain and cortex of animals according to protocols we described previously [2]. Our findings provide the first evidence that PJ treatment protects against dopamine depletion in the midbrain and cortex that correlated well with the enhanced olfactory discrimination performance. In addition, the PJ treatment slightly mitigated a motor deficit, as evidenced by the increased vertical activity.

Keywords: pomegranate juice; dopamine; olfactory impairment; α -synuclein; non-motor symptoms; motor symptoms

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