

## Abstract

**Introduction:** Ifosfamide (IFA) is a useful antineoplastic drug with broad-spectrum efficacy against various types of cancer. However, neurotoxicity, cardiotoxicity, hepatotoxicity, nephrotoxicity and hematological toxicity associated with IFA has limited its use. The aim of the current study is to establish the prophylactic effects of ellagic acid against IFA-induced central neurotoxicity in rats and to determine the histopathological, neurochemical, mitochondrial changes and oxidative parameters status in brain tissue.

**Materials and Methods:** Male Wistar rats were randomly divided into four groups, control group, IFA + ellagic acid group and ellagic acid group. Ellagic acid (25 mg/kg, i.p.) was administered to rats once daily for 2 consecutive days. IFA (500 mg/kg, i.p.) was administered on the second day.

**Results:** Our results demonstrated that only ellagic acid markedly decreased the activity of acetylcholinesterase (AChE) and butyrylcholinesterase (BChE). Also, ellagic acid ameliorated IFA-induced lipid peroxidation and glutathione (GSH) depletion. Histopathological alteration in the IFA-induced brain tissues was decreased especially after administration of ellagic acid. In addition, all mitochondrial toxicity parameters induced by IFA in the rat brain tissue were ameliorated by ellagic acid (post-mortem brain tissue samples).

**Discussion:** Taken together, our results demonstrated that ellagic acid shows a typical neuroprotective effect on IFA-induced acute neurotoxicity through mitochondrial protection and antioxidant properties.

**Keywords:** Ellagic Acid, Ifosfamide, Neurotoxicity, Rat