

## **Edible bird's nest protects histomorphology of rat's uterus against cadmium (Cd) toxicity through a reduction of Cd deposition and enhanced antioxidant activity**

### **ABSTRACT**

Cadmium (Cd) is often associated with reproductive disorders of mammals. Edible bird's nest (EBN) is a natural food product made of swiftlet's salivary secretion used to make their nests and it has been consumed as a tonic food for decades. This research aimed to study the protective effects of EBN against Cd-induced uterine toxicity in Sprague Dawley rats. Thirty (30) female Sprague Dawley rats were assigned into five groups as follows: group 1- negative control (NC) received distilled water; group 2 - positive control (PC) administered with CdCl<sub>2</sub>, 5 mg/kg BW; while groups EBN-1, EBN-2, and EBN-3 received CdCl<sub>2</sub> (5 mg/kg BW) plus graded concentrations of 60, 90 and 120 mg/kg BW of EBN, respectively. After four weeks of daily oral treatment, rats were euthanized to collect the uterus for evaluations of histopathological changes, Cd concentrations and Metallothionein (MT) expressions using H&E stain, inductive coupled plasma mass spectrometry (ICP-MS) and immunohistochemistry, respectively. Blood samples were collected for superoxide dismutase (SOD) analysis using SOD assay kit. Results revealed that the CdCl<sub>2</sub> without EBN supplement (PC) group had elevated levels of Cd in the uterus along with increased MT expressions and decreased SOD enzyme activity as compared to the NC group. Moreover, uterine histopathological changes, including glandular cysts and loss of normal structure of luminal epithelium (LE) and glandular epithelium (GE) were found in the PC group. Interestingly, groups treated with CdCl<sub>2</sub> along with EBN (EBN1, EBN2, EBN3) showed lower levels of uterine tissue Cd deposition and MT expression, lower degenerative changes with normal histomorphology of glands, and increased SOD activity as compared to the PC group. Overall, the findings revealed that oral exposure to Cd at a dose of 5 mg/kg BW resulted in significant alterations in the rat's uterus. However, the toxicity effect was averted by EBN treatment in a dose dependant manner; highest protection achieved with EBN 120 mg/kg BW, through a possible detoxification mechanism and prevention of Cd deposition.

**Keyword:** Edible bird nest; Cadmium; Toxicity; Uterus