البحث الخامس

Age-Related Changes of Purkinje Cells and Astrocytes in Rat Cerebellar Cortex: Histomorphometric, Immunohistochemical and Biochemical Study

مها خالد١، رضوى محمد١، نهاد أحمد صادق٢

١- قسم التشريح وعلم الأجنة- كلية الطب- جامعة الفيوم
٢- قسم الأنسجة وبيولوجيا الخلية – كلية الطب- جامعة الفيوم

Zagazig University Medical Journal, 2024; (1-13)

Abstract

Background: The cerebellar cortex is responsible for coordinating movement, adapting to special conditions, and is involved in storing memories. This cortex undergoes age-related pathological changes in the form of declined cortical thickness, neuronal loss particularly Purkinje cells, hypertrophy, and hyperplasia of the astrocytes as well as alterations in oxidative status. These changes are responsible for various senile disorders. **The aim of work** is to evaluate histological changes in cerebellar Purkinje cells and astrocytes and to determine the alteration in Malonaldehyde (MDA) and Glutathione (GSH) in relation to age in albino rats, and to find a probable correlation between the cellular changes and the oxidative status. **Methods:** Two age groups of albino rats (3-6 months & 22-26 months) were sacrificed, and their cerebella were excised and divided into three parts. 1st part was sectioned and stained with Haematoxylin and Eosin, Silver and Cresyl Violet stains. 2nd part was sectioned and prepared for immunohistochemical study using Glial Fibrillary Acid Protein (GFAP) antibodies then examined by light microscope and morphometric measurements were performed. 3rd part was biochemically processed to measure the MDA and GSH levels. All data were statistically analysed. **Results:** The obtained data showed that the most pronounced age-related changes were the decreased thickness of cerebellar cortex, decreased Purkinje cell number with increased degenerated cells, significant increase in astrocytes immune reactivity to GFAP and insignificant change in MDA and GSH levels. **Conclusions:** Cerebellar cortex of senile rats showed pathological changes in Purkinje cells and astrocytes. These changes were not solely relevant to the oxidative status. Perhaps, other factors contributed as well.

Key Words: Aging; Cerebellar cortex; Purkinje cells; GFAP; Oxidative status.