



IMMUNOHISTOCHEMICAL STUDY OF THE EXPRESSION OF THE IMMUNOLOGICAL MARKERS IL33 AND IL35 ON CNS AFTER INTRAPERITONEAL INJECTION OF AMIKACIN AND MEMANTINE IN WISTAR RATS (ΒΡΑΒΕΙΟ ΚΑΛΥΤΕΡΗΣ ΕΡΓΑΣΙΑΣ ΑΓΓΛΟΓΛΩΣΣΟΥ ΠΡΟΠΤΥΧΙΑΚΟΥ ΠΡΟΓΡΑΜΜΑΤΟΣ)

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Abstract

Objective: The aim of the present study is to shed light on the effect of amikacin on brain and cerebellum tissue, since there has been an established correlation between aminoglycosides, such as amikacin, and neurotoxicity in current literature. Furthermore, given that memantine acts as a neuroprotectant at low doses, it is examined whether it can act against the neural damage caused by amikacin.

Materials and Methods: Forty (40) Wistar rats were used in this experiment, divided into four groups (A-D) of ten (10) rats each one. Group A received no medication. The others for fourteen (14) days intraperitoneally received; amikacin exclusively (Group B), a combination of amikacin and memantine (Group C), memantine following a 2-week amikacin treatment (Group D). Afterwards, euthanasia was performed, and brain and cerebellum tissues were collected and prepared for the application of eosin- hematoxylin staining and observation in the optical microscope. Immunohistochemical study of the expression of IL33 and IL-35, indicative of pro-inflammatory and anti-inflammatory action respectively.

Results: Minor histological lesions were observed in all groups B, C and D. Increase of the intercellular space in the brain and sparsity of the Purkinje cells and of the neurons of the granular layer of the cerebellum were observed in some sites. The lesions were mainly observed in group B and in groups C and D in less intensity and extent. The immunohistochemical study of both brain and cerebellum samples revealed only a low-scale expression of IL33 and IL35 mainly in the meninges.

Conclusion: Considering the emerging evidence of minor neural lesions, there is an indication of possible toxic effect of amikacin and potential reversible effect of memantine. However, further investigation is therefore recommended in order to clarify whether the aforementioned alterations are permanent or not as well as their dependence on the dose of administration.