Evaluation of doxorubicin and mitoxantrone neurotoxicity in CD-1 mice: A chemobrain study

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Introduction

The combination of earlier diagnosis and anti-cancer treatment has led to an increase in cancer survivors. Despite their effectiveness, chemotherapeutic anti-cancer drugs have side effects, such as declining cognitive functions.¹ Doxorubicin (DOX) and mitoxantrone (MTX) are two anti-cancer drugs, both topoisomerase II inhibitors, which have already proved to cause chemobrain, defined as chemotherapy-induced cognitive impairment.² Thus, it is important to understand the underlying mechanisms to reduce or prevent this cognitive dysfunction. Therefore, this work aimed to evaluate the underlying neurotoxicity mechanisms of clinically relevant doses of DOX and MTX in the brain of adult mice.

Methodology

A cumulative dose of 9 mg/kg or 18 mg/kg of DOX or 6 mg/kg of MTX was intraperitoneally (i.p.) administered to adult mice, to mimic the human therapy, for 3 weeks. Brains were collected one week after the last administration. Relevant neuronal proteins were assessed by Western blot. Relevant neuronal proteins were assessed by Western blot.

Discussion and Conclusions

In this study, there were no significant changes in the neuronal proteins analyzed. Despite these results, and since they are initial, further research is necessary, namely at the level of other neuronal proteins, whose changes may be involved in the underlying mechanisms of chemobrain.

References


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