ABSTRACT

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Cancer diseases are the second leading cause of death worldwide. The use of chemotherapeutic agents is considered a fundemental type of treatment for these diseases, with anthracyclines being used the most. Anthracyclines (including for example doxorubicin, daunorubicin, and epirubicin) are classified as topoisomerase II inhibitors. Despite their efficacy, anthracyclines are associated with a relatively large number of adverse effects. Among these, cardiotoxicity is particularly serious, albeit manageable with an appropriate cardioprotective drug. Currently, the only registered cardioprotective agent is dexrazoxane. Relatively recently, it has been reported that the mechanism underlaying cardioprotective effect of dexrazoxane involves the inhibition of topoisomerase II.

This study is part of a broader research aimed at identifying potential cardioprotective topoisomerase II inhibitor compounds. Specifically, the focus of this investigation was to assess the antiproliferative potential of newly designed resveratrol analogues. Resveratrol, a member of the polyphenol group, has shown promising *in vitro* antiproliferative effects and also inhibition of topoisomerase II. The new resveratrol analogues differed mainly in the position and number of methoxy and hydroxy groups. The antiproliferative activity was observed in two cell lines, MCF-7 (breast carcinoma) and HL-60 (human leukemia cells). These results indicate that the new resveratrol analogues are capable of inhibiting cell proliferation.

Key words: DNA topoisomerase II, catalytic inhibitors, anticancer effects, anthracycline antibiotics, resveratrol