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THE POTENTIAL INTERACTION BETWEEN ADRIAMYCIN AND HYPERICUM PERFORATUM L

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Several experimental and clinical studies report that *Hypericum perforatum* L. (HP) can be effective in treating various disorders related to the central nervous system, such as depression and substance use disorder. Cancer is known as a disease that not only impairs life and physical integrity, but also affects mental health. This study aimed at investigating the anticancer activity of the HP extract in an *in vitro* model of esophageal squamous cell carcinoma (ESCC) (i.e., KYSE-30 cells) and its interference with Adriamycin (Adr) as a conventional chemotherapeutic drug. To this aim, cancerous and normal cells (5000 cells/mL) were exposed to both anticancer agents in triplicate to be subsequently tested using the 3-(4, 5-dimethylthiazol-2-yl)-2, 5-diphenyltetrazolium bromide (MTT) assay. A quantitative real-time polymerase chain reaction (PCR) assay was performed to evaluate the mRNA gene expression of Cyclin D1. Both treatments reduced the cell count in a dose-dependent fashion. The IC_{50} of Adr and HP was ~0.090-0.095 mg/mL and ~0.92-0.94 mg/mL in KYSE-30 cells. The maximum inhibition of KYSE-30 cell was 55.9% and 57.1% by individual Adr and HP, respectively. Combined treatments of KYSE-30 cells with Adr and HP significantly reduced the cell viability and yet elevated the level of cyclin D1 expression as opposed to the individual treatments. The presence of HP was found to decrease Adr concentrations below the therapeutic range. The co-treatment of cancer cells with HP led to poor response to Adr and accordingly multidrug resistance as verified by notable up-regulation of cyclin D1 gene expression. Thus, the simultaneous use of Adr and HP is not recommended in cancer disease.

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