Abstract

Majority, if not all, of the available chemotherapeutic agents such as doxorubicin are known of their severe side effects such as cardiotoxicity. Moreover, tumor resistance that is being developed gradually also contributes to the current challenges in cancer therapy.

Resveratrol and Baicalein are well known polyphenolic compounds that belong to stilbene and flavone subclasses respectively. Combination of natural polyphenolic compounds with chemotherapeutic agents is recently being a novel strategy in cancer therapy researches owing to their potential antioxidant and antiinflammatory properties that modulate several intracellular signaling pathways.

This study aims to investigate the possible enhancement effect of resveratrol and baicalein when combined with doxorubicin using different combination ratio and applied on two cancer cell lines: HCT 116 (Colorectal cancer cells) and Hep G2 (Hepatocellular cancer cells). It also investigates the possibility of such natural compounds to provide a protection effect on cardiocytes (H9C2) when resveratrol and baicalein treatment followed by doxorubicin is used.

The two cancer cell lines were treated with different combination groups including combination between doxorubicin and either baicalein or resveratrol and combination between the three compounds using different combination ratio for both treatment groups (i.e. two drugs or three drugs combination). Treatment applied on cells, using cell density of 7000 cells/well and incubation time was 48 hrs. MTT test was performed to assay the cell viability.

Results obtained showed that doxorubicin cytotoxicity on the two cancer cell lines has been increased when combined with resveratrol and baicalein, particularly when using low concentration range of doxorubicin and by using high concentration (IC50) of both baicalein and resveratrol (IC50 of doxorubicin decreased from 4.99 µg/ml to 0.3657 µg/ml and from 7.3 µg/ml to 0.676 µg/ml on HCT 116 and Hep G2 cells respectively using constant combination ratio (1:1:1)). Combination of doxorubicin, baicalein and resveratrol has resulted in less cardiotoxic effect compared to treatment using doxorubicin alone. This decrease was obviously seen when the three compounds were combined using low concentration range and with constant combination ratio.

Detailed view of the monograph

Title: Cytotoxic Evaluation of Doxorubicin in Combination with Baicalein and Resveratrol Against Different Cancer Cell Lines

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