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Influences of digoxin on cell metastasis in hepatocellular carcinoma

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Background: Development of new therapeutic agents is of paramount importance in the management of hepatocellular carcinoma (HCC) patients. Digoxin (DG), a cardiac glycosides and Na^+-K^+-ATPase inhibitor, was a traditional drug for various heart disease therapy and tumor formation. Cell motility, which is driven by cycles of actin polymerization, cell adhesion and acto-myosin contraction and the cell metastasis is the point motility, including the cell migration, invasion, and survival are crucial components of metastasis during cancer process. In this study, we chose several HCC cell lines and observed cell migration, invasion, metastasis ability, F-actin polymerization, hypoxia-inducible-factor-1α (HIF-1α) expression under DG administration.

Methods: We used the HA22T cell line for our studies due to the migratory characteristics of HA22T. Migration from the edge of the injured monolayer was quantified by wound healing assay. For invasion assays, we used modified Boyden chamber transwell motility assay. Confocal microscopy was used to be observed F-actin polymerization. Finally, we detected the expression of HIF-1α under the DG treatment in PLC5 due to its important role in promotion to carcinogenesis pathway.

Results: Our previous findings have been shown that DG significantly decreased the cell viability and proliferation in HA22T cell line. Furthermore, our results showed that DG inhibited the cell migration in HA22T cell line. DG inhibited the cell migration and invasion in HA22T cell line. DG destroyed the F-actin in HA22T and PLC5 cell lines. DG reduced the HIF-1α expression in PLC5 call line.

Conclusion: Our findings indicated that DG suppressed cell metastasis, including cell viability, migration, invasion and F-actin depolymerization. And these protection roles might be associated with suppressing hypoxia pathway. We believed that these novel findings help us to define a new strategy to treat HCC.

Biography

Wei-Ju Huang has earned her PhD degree in 2009 in Department of Physiology, Nation Yang-Ming University. Now, she is an Assistant Professor in Department of Nursing, Hsin-Sheng College of Medical Care and Management. She is interested in the gastrointestinal physiology and completed her studies in cancer therapy with Professor Yung-Ming Jeng in National Taiwan University in 2013. She has about 10 peer-reviewed publications and many national and governmental grants each year. She was also the reviewer in several journals.

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