Steroids induced cytotoxicity in hepatic cancer cells

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Abstract

Hepatic cancer or Hepatocellular carcinoma is a common tumor of liver, in particular between males and it known as a most fatal cancer between others. The usual therapy is sorafenib. Steroids are known for their cell death effect (apoptosis) in case of leukemia, so they are used as supportive therapy along with other treatments against cancer. The study aims to investigate the cytotoxic effect of steroids upon hepatic cancer cells.HepG2 cells are incubated with 1µM of steroid Dexamethasone for three days and cytotoxic effect were evaluated by MTT assay. The results shown a significant inhibitory effect of dexamethasone against hepatoma for certain time and dose.

Background:

cancer of liver cells called hepatoma(J. Li et al., 2019; Liao et al., 2020; J. Liu, Y. Shi, et al., 2019; Qu et al., 2019; Wang et al., 2020), this type of cancer are common especially in aged people (I. M. Chen et al., 2020; Fukuda et al., 2019; Horiuchi et al., 2019; Saez-Carlin et al., 2019; Y. Zhou et al., 2019), this type of cancer are routinely treated by doxorubicin via induction of apoptosis in those malignant cells (Zhang, Luo, & Zhang, 2019), in another study Emodin have been used for its anti-hepatic cancer activity(R. S. Zhou et al., 2019) and the response to treatment and metastatic and invasive ability are found to be correlated with Rev-erbbeta gene in those cells (F. Chen, Zhao, & Xia, 2019). Chicken ovalbumin upstream promoter transcription factor II (COUP-TFII) , belong to steroid/thyroid hormone receptor superfamily are considered to intermediate angiogenesis in hepg2 alongside with other tested cancer cell lines (Erdos & Balint, 2019). ASP-3 which is taken from fish that target endothelial growth factor receptor (VEGFR) signaling pathway is an another form of gene targeting therapy (Guo et al., 2019).also herbal derivitives are tested for their suppressive effect against hepg2 cells due to downregulating CYP3A4 gene (Kobayashi, Sugaya, Onose, & Abe, 2019), other drugs are designed to regulate metabolism (J. Liu, Q. Yao, et al., 2019). Steroids are already used in treating leukemia by inducing apoptosis but it frequently

examined for its effect on other tumors(Carretero-Gonzalez, Salamanca Santamaria, Castellano, & de Velasco, 2019; Fukuda et al., 2019; Gupta et al., 2019; Kamieniarz et al., 2019; X. Liu et al., 2019; Mahadeo et al., 2020; Matsubayashi et al., 2019; Pigg, Banks, & Siddall, 2019; Shivaji et al., 2019; Takamatsu et al., 2019). In current study we are investigating the effect of dexamethasone as steroids on viability of hepatic cancer cells.

Methods:

Hep G2 cell line as a model of liver cancer cells which derived from hepatocellular carcinoma are incubated with 1µM of steroid Dexamethasone for 27 hrs. 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) die for cytotoxicity(Arzi, Hoshyar, Jafarzadeh, Riazi, & Sadeghizadeh, 2020; Rodenak-Kladniew, Castro, Starkel, Galle, & Crespo, 2020) were carried out and the effect was compared with not treated cells to unveil the viability of cells after treatment.

Results:

Steroid treatment suppressed the growth of HepG2 at the above mentioned dose and duration (Fig.1), however other cancer cells have been extensively studied for their response to treatment (Chakraborty et al., 2020; Durkin, Vu, & Lee, 2020; Lee et al., 2020; Roberston et al., 2020; Warsame et al., 2020) and proved dose and duration dependent effect (Coyne & Narayanan, 2019; Daniels-Wells et al., 2019; X. Li et al., 2019; Makdasi et al., 2019; Yamasaki et al., 2019). The real pathway of steroid cytotoxicity in hepatic carcinoma need to be more investigated.

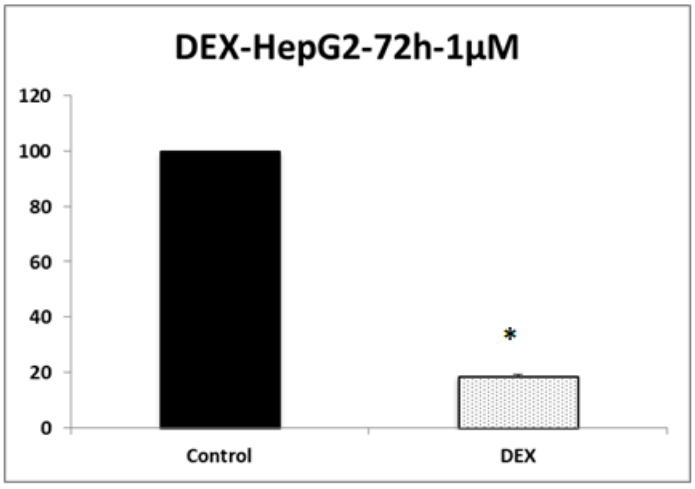

Figure 1 Hepatic cancer cell line treated with dexamethasone 1 µM for 72hrs , growth inhibition effect are noticed. Experiment repeated 3 times in triplicate , significant different are calculated by T- test

Conclusion:

A standard MTT method was used to determine the cytotoxic/ carcinogenic effect of steroids on l.iver tumor cells and that revealed it may included in hepatocellular carcinoma therapy

Keywords: steroids, MTT, Hepatic cancer

Steroids inhibition effect against hepatic cancer .

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