UNIVERSITI TEKNOLOGI MARA

CYTOTOXIC ASSAY OF RxPHOTON ON HEPG2 AND CHANG LIVER CELL LINE

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ABSTRACT

Hepatocellular carcinoma (HCC) is a heterogenous disease which may involve surgical resection if the condition is critical. Due to various reasons, alternative therapies are chosen instead of conventional medical treatments by HCC patients for example, RxPhoton. The problem arises because no scientific investigation has been done to prove its safety and efficacy in HCC. Hence, this study is done to (i) evaluate cytotoxic effects of RxPhoton on HepG2 and CHANG cell lines with different exposure time which are 24, 48 and 72 hours, (ii) determine the effects of double distilled water or normal water with the consumption of RxPhoton and (iii) assess concentration-dependent effects of RxPhoton using ANOVA. Evaluation of cell inhibition for all the treatments was done by an *in vitro* cell culture using MTT assay. The experiment involves lower concentration range (exp. A) and higher concentration range (exp. B). Results show that at the highest concentration of RxPhoton, growth of both cell lines were inhibited. Cell inhibition was observed at low concentration which implies the high toxic effect of the product. Double distilled water and drinking water were proven to have similar effects on RxPhoton. Statistically significant differences in the concentration of RxPhoton for its cytotoxic effects were found in both cell lines (ANOVA; $p<0.05$). Therefore, RxPhoton lacks cell selectivity. Further studies are required to confirm the efficacy and safety of this product for cancer treatment.

Keywords: Hepatocellular carcinoma (HCC), RxPhoton, HepG2 and CHANG cell lines.

CHAPTER 1

INTRODUCTION

1.1 Background of study

Hepatocellular carcinoma (HCC) is the sixth most common cancer worldwide, above all it is the third leading cause of cancer-related death (Murata et al., 2014). Recent study carried out in the Barcelona concluded that surgical resection (SR) had excellent outcomes in survival rates for liver cancer patients (Wang et al., 2013). Other than that, sorafenib is the most recommended therapy of unresectable HCC. However chemotherapy drug has contributed to premature discontinuation of treatment due to its numerous adverse events and no 100% survival rate using current treatment modality. As a consequence, alternative therapies are chosen instead of conventional medical treatments by HCC patients for example, RxPhoton. The problem arises because most of the alternative therapies have either no or little proof in curing cancer or slow its growth. As for RxPhoton, this product claims to reactivate human stem cell and activate the pineal gland to send signals to all parts of the body hence treating liver cancer disease. The evidence based medicine (EBM) evaluation is crucial following all the benefits claimed by the company.