

Protective Role of *Emblica Officinalis* in Albino Rats with Induced Hepatic Carcinoma

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ABSTRACT

Emblica officinalis is a traditional medicinal plant used in this study to control oxidative stress induced by oral administration of hexavalent chromium (10 mg/kg body weight) in albino rats. The serum alpha-fetoprotein levels of Group A, Group B and Group C were (0.78±0.08, 3.15 ±0.33, 1.00±0.22) measured respectively. The significant (< 0.05) changes were seen in all the groups mean while the histopathological analysis of all the groups in photomicrographs also showed a significant changes (< 0.05) in the liver hepatocytes of both group B and group C as compared to control Group A.

Key word: *Emblica officinalis*, Ayurveda medicine, hepatocytes

INTRODUCTION

Cancer or malignancy is an untypical mitosis in which abnormal cells are produced. Cancer has more than hundred different types like lung cancer, prostate cancer, breast cancer, skin cancer, colon cancer and lymphoma². Physiological and Biochemical symptoms are different in each type. Cancer is an epidemic problem all over the world. Each year about 14 million new cases are reported and rate of annual death is approximately eight million¹. There are many causes of cancer in which gene mutations occur with the passage of time in the body. Gene mutation originated by different factors like smoking, radiation, viruses, cancer-causing chemicals (carcinogens), obesity, hormones, chronic inflammation and a lack of exercise etc⁵.

Emblica officinalis is a medicinal Indian Goose berry. Amla is its fruit which used as traditional medicine⁹. The extract of Amla used as an anticancer agent and has its modernized pharmacokinetics and pharmacodynamics³. A study stated that the spectrum of its active ingredients against hepatic carcinoma is excellent [8]. Number of studies concluded that *emblica officinalis* inhibits the growth and spread of different type of cancer, like liver cancer, pancreatic cancer, breast cancer, uterus cancer and stomach cancer etc⁴.

Emblica officinalis minimize the side effects of chemotherapy and radiotherapy. Alcoholic phytochemicals of *emblica officinalis* decreased the cytotoxic and genotoxic effects in cancer cells⁶. Amla fruit has eighteen phytochemicals compounds that inhibit the growth of tumor cells. The major constituent of Amla extract is vitamin C that has antioxidant activity, the only molecules having bona fide anticancer activity to date fall within the tannin or flavonoid categories⁷.

MATERIALS AND METHODS

The present research was conducted in IMBB department. The University of Lahore. The experimental animals in this

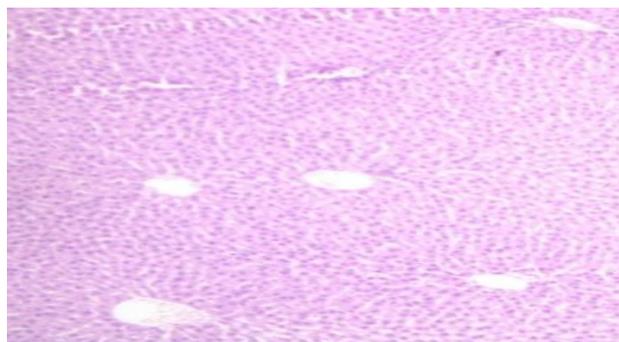
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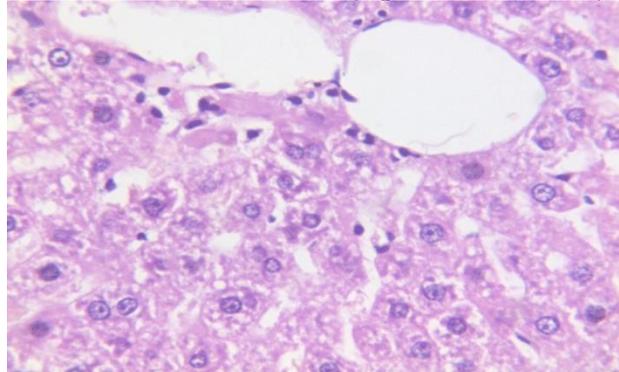
study were Albino rats and they were divided into three different groups. In Group A, 5 rats were controlled while in Group B and Group C there were 10 rats. Oral administration of hexavalent chromium (10 mg/kg body weight) was given to the rats of both Group B and Group C. The body weight of all the rats was in between 90-120 gm. The alcoholic extract of *emblica officinalis* (20gm/kg body weight) was orally given to the rats of Group C. This research project was completed in one year. The livers of all rates were kept in falcon tubes with 10 % formalin for histopathological examination. SPSS software was used for raw data analysis.

RESULTS

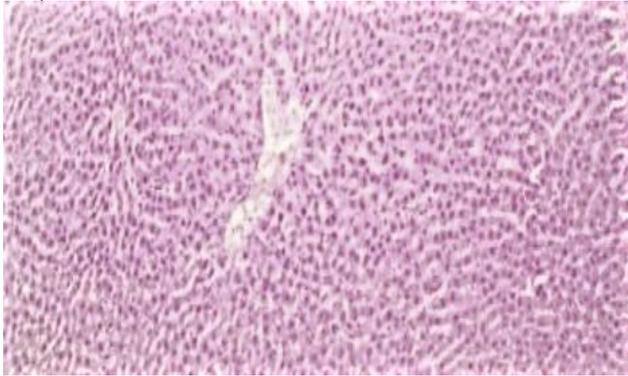
CONTROL LIVER (Fig. 9b, H & E, × 42)



CHROMIUM TREATED LIVER (Fig.-10a, H & E, × 150)



AMLA EXTRACT TREATED LIVER (Fig.10a, H & E, × 150)



Histopathological analysis of all the groups in photomicrographs showed a significant changes (< 0.05) in the liver hepatocytes of both group B and group C. The liver hepatocytes showed cytoplasmic vacuolization with the lateral nuclei arrangement in liver of chromium treated rats. But the hepatocytes of oralay taken Amla extract was in recovery phase. Sufficient quantity of uninucliated hepatocytes with both rough and smooth endoplasmic reticulum were also seen in the extract treated group.

Serum levels of alpha-fetoprotein (µg/ml) (Group A= n: 5, Group B=n: 10 Group C=n: 10)

Groups	Serum levels of alpha fetoprotein (µg/ml) Mean values ± SD	Significant
Group A	0.78±0.08	0.00
Group B	3.15 ±0.33	0.00
Group C	1.00±0.22	0.00

< 0.05

Serum alpha-fetoprotein levels of Group A, Group B and Group C were (0.78±0.08, 3.15±0.33, 1.00±0.22) measured respectively. The significant< 0.05 changes were seen in all the groups.

DISCUSSION

Serum alpha-fetoprotein levels are an indicator of different types of liver diseases. By applying this test efficacy of a treatment against cancer can monitor According to a study of A scientist (Stern, 2010) hexavalent chromium is carcenogenic in natuer. In Pakistan Hexavalent chromium

is a ingredient of many diffrent industries and its use is very comman . actually this study is a indication of hexavalent chromium in the environment and its toxic effects on the biological system. In this study when oral administration of hexavalent chromium (5mg/kg b.w) in water was given to the albino rats of Group B. The cytotoxic and genotoxic effects were noted in pulmonary tissues of Group B rats. A significant (< 0.05) increase of hexavalent chromium was seen in the pulmonary tissues of Group B rats as compared with the Group A respectively. *Meduri et al.*, 2007 stated in their study the same findings as the current study.

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