ABSTRACT

Hepatocellular carcinoma is the third leading cause of mortality and account for one million deaths annually, globally. Chemotherapy and radiotherapy are the conventional treatments with multiple side effects. In this regard, current study was aimed to investigate the anti-cancerous potential of probiotic *Lactobacillus reuteri* against hepatocellular carcinoma (HCC). Mice (60) were divided into 08 groups. Group 2 was administered with DEN for one month to induce HCC and then mice (20) were further divided into four subgroups 2A, 2B, 2C and 2D, treated with *Lactobacillus reuteri*, cisplatin, cisplatin+*L. reuteri* and DEN, respectively. The biochemical analysis showed higher level of biomarkers *i.e.*, AFP (97.8 ± 3.1 ng/mL), ASAT (528.4± 9.7 U/L), ALAT (249.2 ± 5.1 U/L), ALP (394.0 ± 6.0 U/L), LDH (968.8 ± 10.2 U/L), GGT (58.7± 1.7 U/L), bilirubin (11.1 ± 0.5 mg/dL), MDA (12.2 ± 0.3 mmol/L) and lower level GSH (2.4± 0.2 umol/L) and Catalase (91.8± 3.3 mmol/L) was observed in the DEN administered group that indicated the induction of HCC in mice. However, lower level of biomarkers *i.e.*, AFP (53.0 ± 1.2 ng/mL), ASAT (285.4 ± 6.9 U/L), ALAT (152.4 ± 4.2 U/L), ALP (235.2 ± 1.8 U/L), LDH (575.2 ± 14.1 U/L), GGT (32.2 ± 1.2 U/L), Bilirubin (6.2 ± 0.2 mg/dL), MDA (6.8 ± 0.2 mmol/L) and higher level of biomarkers i.e., GSH (3.9 ± 0.1 umol/L) and Catalase (159.0 ± 3.2 mmol/L) was observed in treatment group with *L. reuteri* + cisplatin. The histopathological analysis of liver from DEN treated group showed damaged central vein, liver hemorrhage with chronic inflammation. However, in the treatment group *L. reuteri* + cisplatin, mild inflammation, normal central vein and activation of kupffer cells was observed. It is concluded that *L. reuteri* has great anti-cancer potential in the prevention and treatment of hepatocellular carcinoma.