# ABSTRACT

Non-alcoholic fatty liver disease (steatosis) is the most common chronic liver disease associated with many other metabolic disorders such as obesity, hyperlipidemia, diabetes mellitus type 2, insulin resistance and oxidative stress. Its prevalence among adult population is approximately 32% worldwide and this prevalence is increasing every year. With respect to its prevalence and adverse consequences, this disease should be treated properly with appropriate medication but still there is no approved drug to treat this chronic disorder. The purpose of this study was to evaluate protective effects of CaC-1000 Plus (calcium supplement along with vitamins B6, D3 & C) against NAFLD induce by dietary high fat and high fructose diet (HFD+HFr). In this study 60 male albino mice were used and divided into two major categories; hepatoprotective experiment (12 weeks; experimental time duration) and hepatocurative experiment (16 weeks; experimental duration), each experimental category with 30 mice. In hepatoprotective experiment these 30 mice were divided into further three groups; control group (kept on normal conditions for 12 weeks), HFD+HFr group (fed on HFD+HFr for 12 weeks) and HFD+HFr+CaC group (fed on HFD+HFr along with CaC-1000 Plus for 12 weeks). During these 12 weeks body weight of mice were also measured on weekly basis. After this time period experiment were also divided into three groups; control group (kept on normal conditions and fed on normal pallet diet), HFD+HFr group (fed with HFD+HFr for 12 weeks and then kept on normal conditions for next four weeks) and HFD+HFr+CaC group (fed on HFD+HFr for 12 weeks and then treated with CaC-1000 Plus for next four weeks). After all these proceedings, dissection was done to get body organs and blood for further testing. The results of this study are showing that there is a significant difference between body weights before and after treatment. CaC-1000 Plus has significantly ($p<0.05$) reduced body weight by ameliorating fat accumulation in the body. Histopathological evaluation is also describing the protective effects of CaC-1000 Plus in both experiments. Furthermore, the lipid profiles (cholesterol, triglycerides, LDL, VLDL & HDL) have significantly increased ($p<0.05$, $p<0.01$ and $p<0.001$) in the groups which were fed on HFD+HFr and after treatment with CaC-1000 Plus have significantly improved lipid
dissection was performed for further analysis. Similarly, 30 mice in hepatocurative
profiles in both experiments. Correspondingly, in case of liver function tests (AST, ALT & ALP), these parameters were elevated in those groups which were fed on HFD+HFr but the treatment groups showed significant ($p<0.05$, $p<0.01$) decrease in their liver enzymes concentrations. On the other hand, serum proteins (bilirubin, albumin & total proteins) have reduced in the groups which were fed on HFD+HFr except bilirubin which were enhanced in the HFD+HFr groups as compare to the treated groups. There is a significant ($p<0.05$, $p<0.01$) increase in the serum protein concentration after treatment with the CaC-1000 Plus. Therefore, it can be concluded that the results from both experiments (hepatoprotective and hepatocurative) are evidently demonstrating that CaC-1000 Plus has significant protective effects against NAFLD induced by the HFD+HFr.