ABSTRACT

Non-Alcoholic Fatty liver disease being the most popular and frequently occurred type of fatty liver with high prevalence across the globe. Owing to many associated factors, the most important factors linked with NAFLD is obesity. *Terminalia arjuna* is also known as the arjuna plant or Arjun tree and related to the family Combretaceae. The bark of *Terminalia arjuna* retains many essential phytochemicals including triterpenoid Arjunolic acid. This plant is famous for its hepatoprotective activity. One of the leading causes of NAFLD is linked to obesity. The main purpose of this research is to evaluate the therapeutic potential of *Terminalia arjuna* bark extract against NAFLD. Albino mice were divided into 3 groups with 10 mice in each group. Fatty liver is induced by giving 20% Fructose-Drinking water. Mice were fed orally with *Terminalia arjuna* bark extract dose with a concentration of 400mg/kg. Anthropomorphic parameters show decrease in BMI, and reduced level of blood glucose levels in the treatment group. A liver enzyme (AST, ALP) shows a decrease in the treatment group compared with the diseased control group. The histological analysis shows that the liver of the Normal control group shows normal liver morphology with hepatocytes arranged in sequence. The diseased control group has liver cells irregularly arranged hepatocytes having non-eosinophilic cytoplasm and lipid droplets while the treatment group lowered these abnormalities. The molecular docking shows the bioactive compound arjunolic acid present in the bark of *TA* shows a ligand-protein relationship with PPARα and PPARγ following the AMPK pathway. Altogether, these results show that the *Terminalia arjuna* bark extract possesses an anti-NAFLD potential.

KeywordsNAFLD, *Terminalia arjuna*, Obesity, Fatty Liver, Arjunolic acid, Molecular Docking, Insulin resistance, PPRAα, PPRAγ, AMPK pathway.