Effect of Quercetin on the Expression of SRBP-1c mRNA in High Fat Diet-Induced NAFLD in Mice
Jamal Nasser Saleh Al-maamari*,1, Mahardin Rahmadi2, Sisca Melani Panggono2, Devita Ardina Prameswari1, Eka Dewi Pratiwi1, Chrismawan Ardianto2, Santhra Segaran Balan3, Budi Suprapti2

Introduction

- Non-alcoholic fatty liver disease (NAFLD) is the most cause of chronic liver disease and is predicted to be the most common liver transplant cause in 2030. NAFLD is characterized by increased intracellular triglyceride accumulation in the liver. NAFLD pathogenesis remains unclear; a "two-hit" theory has been proposed to explain NAFLD development [1].
- Sterol regulatory binding protein-1c (SREBP-1c) is one of the main regulators of gene expression involved in the synthesis of liver triglycerides. Through another pathway, excessive activity of SREBP-1c results in increased pathologic fat synthesis and causes the accumulation of hepatic fat (steatosis) [2].
- There are no approved drugs for NAFLD therapy, and the current strategies are lifestyle modification (diet, physical activity...etc.) [3].
- Quercetin is a flavonoid compound that has hepatoprotective properties and has shown antioxidant properties based on numerous studies [4].

Objective

The study aimed to determine the effect of Quercetin on the expression of primary regulator gene involved in lipogenesis and triglycerides synthesis in the liver, the Sterol regulatory binding protein - 1c (SREBP - 1c) mRNA in Non-Alcoholic Fatty Liver Disease (NAFLD) with high-fat diet (HFD) model.

Material and method

- Fifty-six Bab/c mice were divided into seven groups: standard feed; high-fat diet (HFD); HFD and Quercetin 50 mg/kg for 28 days; HFD and Quercetin 100 mg/kg BW for 28 days; HFD and Quercetin 50 mg/kg for 14 days; HFD and Quercetin 100 mg/kg for 14 days; HFD and repaired fed for 14 days.
- Quercetin was administered intraperitoneally. The animals were sacrificed 24 hours after the last treatment; the liver was taken for macroscopic, histopathological evaluation by staining using hematoxylin-eosin and examination of the relative expression of SREBP-1c mRNA in liver tissue using reverse transcription-polymerase chain reaction (RT-PCR).
- The data obtained from this study were analyzed using the GraphPad Prism program. SREBP-1c was analyzed by one-way ANOVA method with a 95% degree of confidence and followed by a follow-up post hoc test. If Sig. <α (0.05), then Ho is rejected, and Ha is accepted.

Conclusion

Based on the research results, it was concluded that giving Quercetin at a dose of 50 mg/kg and 100 mg/kg of body weight can reduce levels of SREBP1c in the mice’s liver that have NAFLD, which induced by a high-fat diet (HFD) model and also improve the histopathological manifestations for the livers of mice with NAFLD model.

References