Effects of Retinoic Acid on Liver Triglyceride Level and Diacylglycerol Acyltransferase-2 (DGAT2) Gene Expression in Rats with High-Cholesterol Diet-Induced Steatosis

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Abstract

INTRODUCTION: Non-alcoholic fatty liver disease (NAFLD) incidence is rising globally without effective treatment available. Serum retinoic acid level was found to be low in NAFLD patients. Thus, this study investigated the effects of retinoic acid administration on liver triglyceride levels and Diacylglycerol acyltransferase 2 (DGAT2) gene expression in high-cholesterol diet-induced steatosis rats. MATERIALS AND METHODS: Forty male Sprague-Dawley rats were divided into five groups (n=8/group). Groups A and B received a normal diet, while groups C, D, and E were fed a high cholesterol diet (HCD) for four weeks to induce steatosis (Phase 1) and continued with the same diet for the next four weeks (Phase 2). In Phase 2, Group D received vehicle (Olive oil), while Groups B and

E received retinoic acid (7.5mg/kg subcutaneously) twice weekly with their respective diet. Liver triglyceride levels were measured using the Bligh and Dyer's method, and hepatic DGAT2 gene expression was quantified using Real-Time qPCR. Data was analysed using the One-Way Analysis of Variance (ANOVA) test. RESULTS: Retinoic acid-treated groups showed a reduced pattern in liver triglyceride levels, in which Group E level is 3.6±0.88 mg/g compared with Group C 4.12±1.5 mg/g, but statistically insignificant (p>0.05). The DGAT2 expression was significantly reduced in Group E by 0.63-fold (63%) when compared to Group C. CONCLUSION: These findings suggest that retinoic acid administration might reduce the liver triglyceride level by down-regulating DGAT2 gene expression. However, further studies are required to confirm retinoic acid as a potential candidate for improving NAFLD.

Author keywords

DGAT2 expression; High cholesterol diet; liver Triglyceride; Nonalcoholic fatty liver disease; Retinoic acid

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