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Alfarisi, H.A.H.[a] , Ibrahim, M.B.[a] , Mohamed, Z.B.H.[a] , Azahari, N.[a] , Hamdan, A.H.B.[b] , Che Mohamad, C.A.[c]

Hepatoprotective Effects of a Novel Trihoney against Nonalcoholic Fatty Liver Disease: A Comparative Study with Atorvastatin

(2020) *Scientific World Journal*, 2020, art. no. 4503253, .

DOI: 10.1155/2020/4503253

[a] Department of Nutrition Sciences, Kulliyyah of Allied Health Sciences, International Islamic University Malaysia, Kuantan, Pahang, 25200, Malaysia

[b] Department of Pathology and Laboratory Medicine, Kulliyyah of Medicine, International Islamic University Malaysia, Kuantan., Pahang, 25200, Malaysia

[c] Department of Basic Medical Sciences, Kulliyyah of Pharmacy, International Islamic University Malaysia, Kuantan., Pahang, 25200, Malaysia

Abstract

Nonalcoholic fatty liver disease (NAFLD) is the most prevalent chronic liver disorder worldwide with no curative therapy. The aim of this study was to investigate the hepatoprotective effects of a novel Trihoney against biochemical and histological manifestations of NAFLD in hypercholesterolemic rabbits. Methodology. Forty-eight male New Zealand white (NZW) rabbits were grouped into normal diet (C), normal diet with 0.6 g/kg/day of Trihoney (C + H), 1% cholesterol diet (HCD), 1% cholesterol diet with 0.3 g/kg/day of Trihoney (HCD + H1), 1% cholesterol diet with 0.6 g/kg/day of Trihoney (HCD + H2), and 1% cholesterol diet with 2 mg/kg/day of atorvastatin (HCD + At.). Animals were sacrificed after 12 weeks of treatment. Serum lipids and liver function test (LFT) were measured prior to and at the endpoint of the experiment for total cholesterol (TC), low-density lipoprotein (LDL-c), alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (ALP), gamma-glutamyl transferase (GGT), and total bilirubin (T. Bil.). Liver was processed for histopathology study. Liver homogenate was analysed for oxidative stress parameters: superoxide dismutase (SOD), glutathione peroxidase (GPx), and malondialdehyde (MDA). Results. Lipid analysis approved the induction of hypercholesterolemia. A significant elevation ($p<0.01$) of serum AST and ALT levels showed by the HCD group was compared to C and C + H groups. Trihoney exhibited a significant reduction ($p<0.001$) of AST and ALT compared to the HCD group. Likewise, AST and ALT reduced significantly in the HCD + At. group ($p<0.001$). Trihoney supplementation induced significant ($p<0.05$) enhancement of SOD and GPx activities. Atorvastatin treatment was associated with significant ($p<0.05$) reduction of SOD and GPx activities in the liver. Trihoney and atorvastatin showed marked ($p<0.001$) reduction of hepatic lipid peroxidation. Trihoney showed histological protection against progression of NAFLD to nonalcoholic steatohepatitis (NASH). Atorvastatin exhibited no beneficial impact on hepatic architecture. Conclusion. Trihoney was able to maintain normal liver function and showed hepatoprotection against progression of NAFLD to NASH probably through hypocholesterolaemic and antioxidant functions. © 2020 Hamad Abdulsalam Hamad Alfarisi et al.

Index Keywords

alanine aminotransferase, alkaline phosphatase, aspartate aminotransferase, atorvastatin, bilirubin, gamma glutamyltransferase, glutathione peroxidase, liver protective agent, low density lipoprotein, malonaldehyde, superoxide dismutase, trihoney, unclassified drug, atorvastatin, hypocholesterolemic agent; alanine aminotransferase blood level, animal experiment, animal model, animal tissue, Article, aspartate aminotransferase blood level, cholesterol blood level, cholesterol diet, controlled study, enzyme activity, histopathology, hypercholesterolemia, lipid analysis, lipid liver level, lipid peroxidation, liver function test, liver homogenate, liver protection, male, New Zealand White (rabbit), nonalcoholic fatty liver, nonalcoholic steatohepatitis, nonhuman, oxidative stress, adverse event, animal, cholesterol intake, comparative study, drug effect, honey, Leporidae, lipid diet, liver, nonalcoholic fatty liver, pathology; Animals, Anticholesteremic Agents, Atorvastatin, Cholesterol, Dietary, Diet, High-Fat, Honey, Liver, Male, Non-alcoholic Fatty Liver Disease, Rabbits

Chemicals/CAS

alanine aminotransferase, 9000-86-6, 9014-30-6; alkaline phosphatase, 9001-78-9; aspartate aminotransferase, 9000-97-9; atorvastatin, 134523-00-5, 134523-03-8; bilirubin, 18422-02-1, 635-65-4; gamma glutamyltransferase, 85876-02-4; glutathione peroxidase, 9013-66-5; malonaldehyde, 542-78-9; superoxide dismutase, 37294-21-6, 9016-01-7, 9054-89-1; Anticholesteremic Agents; Atorvastatin; Cholesterol, Dietary

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(2020) *Malaysian Journal of Medicine and Health Sciences*, 16 (2), pp. 230-236.

Correspondence Address
Ibrahim M.B.; Department of Nutrition Sciences, Malaysia; email: abumaisarah@iium.edu.my

Publisher: Hindawi Limited

ISSN: 23566140
PubMed ID: 33132768
Language of Original Document: English
Abbreviated Source Title: Sci. World J.
2-s2.0-85094867703
Document Type: Article
Publication Stage: Final
Source: Scopus