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The effects of kefir drink on liver aminotransferases and metabolic indicators in patients with nonalcoholic fatty liver disease: a randomized controlled trial

Farzaneh Mohammadi[1,2], Nadia Razmjooei[1,2], Mohammad Ali Mohsenpour[1,2], Mohammad Ali Nejati[3], Mohammad Hassan Eftekhari[2] and Najmeh Hejazi[2*]

Abstract

Background and aim Probiotics play an important role in the control and treatment of non-alcoholic fatty liver disease (NAFLD). Kefir drink is a fermented beverage and has indicated some beneficial health effects. The aim of this study was to evaluate the effects of kefir drink on liver aminotransferases, anthropometric indices, glycemic index, lipid profile, blood pressure (BP), high sensitivity C-reactive protein, and malondialdehyde in patients with NAFLD.

Methods In an 8-week randomized clinical trial, 80 patients with NAFLD were randomized into two groups of 40. After a 2-week run-in period, the groups received a dietary plan and dietary plan plus a cup of kefir drink twice a day (500 cc/d), respectively. Also, demographic, anthropometric, laboratory, BP, dietary intake, and physical activity assessments were analyzed before and after the intervention.

Results At last, seventy-two participants completed the study. No significant difference in changes in BP, anthropometric indices, and laboratory data ($P > 0.05$) except HDL-C ($P = 0.02$) and fat-free mass ($P < 0.001$) was observed between the two study groups.

Conclusion Based on the results, Drinking 500 cc/d kefir beverage had no significant effect on liver aminotransferases and metabolic indicators, except for HDL-C and fat-free mass in patients with NAFLD.

Trial registration IRCT20170916036204N6 (2018/08/03).

Keywords Non-alcoholic fatty liver disease (NAFLD), Metabolic dysfunction-associated fatty liver disease (MAFLD), Kefir, Liver aminotransferase, Metabolic indicator

*Correspondence:
Najmeh Hejazi
najmehhejazi@gmail.com
[1]Student Research Committee, School of Nutrition and Food Sciences, Shiraz University of Medical Sciences, Shiraz, Iran
[2]Department of Clinical Nutrition, School of Nutrition and Food Sciences, Shiraz University of Medical Sciences, Shiraz, Iran
[3]Department of Internal Medicine, Gastroenterohepatology Research Center, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran

The effects of kefir drink on hs-CRP

Since inflammatory conditions are one of the main stimuli of damage to the hepatocytes and predispose them to the progression of the disease to fibrosis [57], control and mitigation of inflammation are essential in the treatment process of NAFLD patients. In the present study, hs-CRP was measured as an inflammatory marker. Although the intervention with kefir reduced the level of hs-CRP, this change was not statistically significant. Consistent with the present study, probiotic supplementation alone did not affect hs-CRP, but hs-CRP was significantly reduced only in the group that was supplemented with probiotics and prebiotics [12]. On the other hand, some prior studies with the intervention of probiotics in different patients resulted in a reduction in hs-CRP level [58, 59]. The non-significant decrease in hs-CRP in our study may be due to different combinations of probiotics, the short study period, or the low-grade inflammatory status of participants.

In conclusion, the reason for the lack of effect of kefir on some parameters and the reason for the difference in results between studies can be attributed to the differences in individual microbiota, study duration, and dose of interventions. Therefore, it is suggested that future studies be conducted by measuring the amount of individual microbiota with different doses of probiotic strains.

Limitations

Due to the limitations of this study, such as the short duration of the study, small sample size, baseline nutritional differences, lack of blindness, and lack of measurement of the fatty liver using non-invasive methods, it is suggested that studies should be conducted in the future in accordance with these limitations.

Conclusion

Drinking 500 cc/d kefir beverage in addition to a balanced, restricted-energy diet may increase the HDL-C level and fat-free mass in NAFLD patients, so more studies are recommended on this issue.

Abbreviations

NAFLD	Non-alcoholic fatty liver disease
BP	Blood pressure
hs-CRP	High sensitivity C-reactive protein
MDA	Malondialdehyde
HDL-C	High-density lipoprotein cholesterol
NASH	Non-alcoholic steatohepatitis
MetS	Metabolic syndrome
DM	Diabetes mellitus
HTN	Hypertension
ALT	Alanine transaminase
AST	Aspartate transaminase
BMI	Body mass index
TC	Total cholesterol
TG	Triglyceride
FBS	Fasting blood sugar
LDL-C	Low-density lipoprotein cholesterol
TBARS	Thiobarbituric acid reactive substances
IR	Insulin resistance
HOMA-IR	Homeostasis model assessment of insulin resistance
WC	Waist circumference
BIA	Bioelectrical impedance analysis
IPAQ	International physical activity questionnaire
MET	Metabolic equivalent
STAT 3	Signal transducer and activator of transcription 3
p-JAK 2	Phosphorylated Janus kinase 2
p-STAT 3	Phosphorylated STAT 3
CPT-1	Carnitine palmitoyltransferase-1
SREBP-1	Sterol regulatory element-binding protein 1
ACC	Acetyl-CoA carboxylase
PPAR-α	Peroxisome proliferator-activated receptor alpha
FABP4	Fatty acid-binding protein 4
IL-6	Interleukin 6
MCP-1	Monocyte chemoattractant protein 1
GLP	Glucagon-like peptide
GIP	Gastric inhibitory peptide
ACE	Angiotensin-converting enzyme

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Author contributions

FM: formal analysis, investigation, methodology, writing – original draft, writing – review & editing. NR: conceptualization, data curation, investigation, methodology, project administration, writing – review & editing. MAM: formal analysis, investigation, methodology, writing – review & editing. MAN: investigation, methodology, project administration, writing – review & editing. MHE: investigation, methodology, project administration, writing – review & editing. NH: conceptualization, methodology, project administration, supervision, writing – review & editing.

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Data availability

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

This study was approved by the Ethics Committee of Shiraz University of Medical Sciences, Shiraz, Iran (IR.SUMS.REC.1397.107). The study was also conducted following the Helsinki Declarations of Ethics. The informed consent form was completed for all the patients.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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