

Winter Conference 2023, 5-6 December 2023, Diet and lifestyle strategies for prevention and management of multimorbidity

Effects of a multicomponent lifestyle modification intervention on liver function, lipid profile, and body composition in adults with elevated hepatic steatosis index

P. Moitra¹, A. Jhaveri¹, P. Tailor¹, P. Khedekar¹ and J. Madan²

¹Department of Postgraduate Programs and Research, SVT College of Home Science, SNDT Women's University, Mumbai, India

²Department of Food, Nutrition & Dietetics, SVT College of Home Science, SNDT Women's University, Mumbai, India

Parallel to the escalating burden of obesity is the steadily increasing prevalence of metabolic dysfunction associated steatotic liver diseases (MASLD), a chronic condition that progresses from simple steatosis to advanced stages of steatohepatitis, fibrosis, and cirrhosis (1-2). MASLD, regarded as the hepatic manifestation of metabolic syndrome is known to be exacerbated by unhealthy lifestyle choices and the presence of comorbidities such as diabetes, dyslipidemia, and obesity (3-4). Therefore, early identification of the general population at risk of MASLD and the development of multicomponent interventions that can prevent the progression of liver damage and mitigate associated adverse cardiometabolic health outcomes are important. Our study aimed to evaluate the effects of a lifestyle modification program on glucose levels, lipid profile, liver function, and body composition measures in community-living adults with elevated hepatic steatosis index in Mumbai, India.

Adults (n= 231, mean age 46.1(13.7) years), 58.6% men) were screened for risk of MASLD using a non-invasive screening tool, Hepatic Steatosis Index (HSI) (calculated as $(HSI) = 8 \times (ALT/AST \text{ ratio}) + BMI (+2, \text{ if female; } +2, \text{ if diabetes mellitus})$ (5). Eligible participants with $HSI > 36$ (predictive of the presence of MASLD) were randomized to receive either a multicomponent lifestyle intervention (experimental group, EG) comprising weekly sessions of individualized dietary counseling (Participants having $BMI > 23 \text{ kg/m}^2$ (n = 36) received hypocaloric diets with 40% carbohydrates, 40% fat and 30% proteins (WLD) and those having $BMI < 22.9 \text{ kg/m}^2$ (n= 22) received weight maintenance diet (WMD) plans including 55% carbohydrates, 15% protein and 30% fats) and fortnightly group sessions of structured exercise and nutrition education or a standard of care package (control group, CG, n= 43) including general healthy eating and activity guidelines for the 8- week study duration. Paired t test and independent sample t tests were used to determine within and between group changes in variables from baseline to endline.

Trial Registration: This study is registered as CTRI/2022/05/042927.

Overall, the prevalence of MASLD was 52.2%, 32.8% were hypertensive, and 26.7% and 15.4% had diabetes and hypertriglyceridemia respectively. The intervention (WLD) resulted in decreased weight (mean (M)= 3.4 kg, standard error (SE) = 1.88 k, p = 0.02), body fat percent (M = 2.2%, SE = 1.1%, p= 0.042), serum triglycerides (M=28.8mg/dL, SE 8.5mg/dL, p<0.001) and AST (M= 3.8 U/L, SE= 2.2U/L, p <0.05) values. The WMD group reported improvements in serum cholesterol levels, and ALT/AST ratio as compared to CG (p <0.001). In WMD, HDL-C increased from 45.8 mg/dl to 47.2 mg/dl and the mean AST values reduced from 28.8 (10.6) U/L to 25.6 (9.9) U/L, but these changes were not statistically significant.

Multicomponent lifestyle modification programs integrating diet, physical activity and education are effective strategies to improve liver outcomes and optimize cardiometabolic health in people with MASLD.

References

1. Xia Y, Wu Q, Dai H *et al.* (2021) *Front Nutr* 8.
2. Boutari C & Mantzoros CS (2022) *Metabolism* 133, 155217.
3. Shalimar, Elhence A, Bansal B *et al.* (2022) *J Clin Exp Hepatol* 12(3), 818–829.
4. Musso G, Gambino R, Durazzo M *et al.* (2010) *Hepatology* 51(2), 715–717.
5. Younossi ZM, Koenig AB, Abdelatif D *et al.* (2016) *Hepatology* 64(1), 73–84.