



Impact Of Weight Loss On Non-Alcoholic Fatty Liver Disease

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ABSTRACT

Non-alcoholic fatty liver disease (NAFLD) is a global chronic liver disease that is highly correlated with insulin resistance and obesity.

This review focuses on how weight reduction affects the development of non-alcoholic fatty liver disease. The majority of chronic liver diseases are non-alcoholic fatty liver disease (NAFLD), and as the NAFLD population ages, there is a growing incidence of non-alcoholic steatohepatitis (NASH) with fibrosis. Notable weight loss can enhance non-alcoholic fatty liver disease and non-alcoholic steatohepatitis. A balanced diet, regular exercise and several bariatric surgeries can help to reduce body weight and improve fibrosis, non-alcoholic steatohepatitis and liver fat. Diets low in carbohydrates, rich in fiber, high in protein, and hypocaloric aid in weight loss and reduce liver fat. Additionally, exercise reduces the buildup of fat in the liver, which has therapeutic effects for NAFLD. This review discusses the data showing that weight loss improves NAFLD patients' liver outcomes.

KEYWORDS

Dietary intervention, Exercise intervention, Liver, Non-alcoholic fatty liver disease, Surgical interventions, Weight reduction

INTRODUCTION

About one-third of the general population is thought to be affected with non-alcoholic fatty liver disease (NAFLD), the most prevalent chronic liver disease in the world ^[1,2]. It covers a wide range of illnesses, including hepatocellular carcinoma, advanced fibrosis, end-stage liver disease, non-alcoholic fatty liver (NAFL), and non-alcoholic steatohepatitis (NASH) ^[3]. Hepatic steatosis is the defining characteristic of non-

alcoholic fatty liver disease (NAFLD), a clinicopathological disorder that is primarily caused by alcohol and other specific liver damaging factors. The development of non-alcoholic fatty liver disease (NAFLD) has been linked to lipotoxicity, oxidative stress, endoplasmic reticulum stress, and lipid buildup, as evidenced by recent studies. A diagnosis of non-alcoholic fatty liver disease (NAFLD) is made when other apparent causes, such as excessive alcohol intake, viral hepatitis, and medications that encourage fatty changes, are eliminated [4]. The frequency and severity of NAFLD are rising along with obesity and diabetes, and as the population ages, a significant portion of NAFLD patients will develop cirrhosis and end-stage liver disease. Furthermore, NAFLD has a strong correlation with diabetes, chronic renal disease, and cardiovascular disease, all of which raise the risk of cardiovascular death [5]. For NAFLD, there aren't any authorized pharmacologic treatments as of yet. As a result, the suggested treatment for metabolic syndrome and NAFLD are similar in that they both center on changing lifestyle factors like eating habits, exercising more, and losing weight [6]. This review focuses on the dietary and exercise interventions on non-alcoholic fatty liver disease.

NAFLD AND DIETARY INTERVENTIONS

In line with the recommendations for metabolic syndrome, patients with NAFLD should also adopt lifestyle changes such as weight loss, complete calorie restriction, and increased physical exercise. In a study on weight loss through lifestyle modification significantly reduces features of non-alcoholic steatohepatitis conducted by Eduardo vilar-gomez et al, they determine the effect of a hypocaloric diet on the histologic characteristics of non-alcoholic steatohepatitis (NASH), 261 patients were given a 52-week lifestyle intervention that included a 750 kcal/day calorie deficit diet and paired liver biopsies. Subjects who lost more than 5% of their body weight in this study saw a larger decrease in NASH than those who lost less than 5%. Notably, only 10% of patients reached this level of weight loss. Subjects with > 10% weight loss all had decreases in NAS, while 90% had resolution of NASH and 45% had regression of fibrosis [7]. In another study conducted by ruth chan et al, on diet-quality scores and prevalence of non-alcoholic fatty liver disease: A population study using proton-magnetic resonance spectroscopy. This study looked at the relationship between the prevalence of NAFLD and two diet-quality scores, the Mediterranean Diet Score (MDS) and the Diet Quality Index-International (DQI-I). In cross-sectional population-based study conducted in Hong Kong between 2008 and 2010, 465 female and 332 male apparently healthy adults who were at least 18 years old were selected through a population screening process. Dietary information from a food frequency questionnaire was used to compute DQI-I and MDS, as well as main food groups and nutrient intakes. And they concluded that better diet quality, as measured by a higher DQI-I and increased consumption of fruits, vegetables, and legumes, was linked to a lower risk of developing NAFLD in Hong Kong Chinese [8]. A prospective observational study conducted by anita arslanow et al, on short-term hypocaloric high fiber and high protein diet improves hepatic steatosis assessed by controlled attenuation parameter, here 60 individuals suffering from hepatic steatosis were observed while following a hypocaloric, high-protein, high-fiber diet that provided 1,000 kcal per day. They used established clinical-chemical assays to evaluate blood liver function tests, lipid profiles, body composition, and hepatic fat contents utilizing CAP during transient elastography, both at baseline and after

14 days. A notable decrease in CAP was noted after 14 days, going from 295 dB/m to 266 dB/m. Body weight dropped by 4.6% concurrently, with body fat accounting for 61.9% of the drop. Furthermore, there was a decrease in serum lipid concentrations, γ -GT activity, and liver stiffness ^[9]. In a 7-week double blinded randomized controlled trial by fredrik Rosqvist et al, on overfeeding polyunsaturated and saturated fat causes distinct effects on liver and visceral fat accumulation in humans. And they found that excess energy from polyunsaturated fats (PUFAs) may support lean tissue in healthy adults, while consuming SFAs encourages the storage of fat in the liver and viscera ^[10]. In a cross-sectional study conducted by jiantao ma et al, they investigated the cross-sectional relationship between fatty liver disease and diet soda or beverages with added sugar consumption in individuals from the Framingham Offspring and Third Generation cohorts. Liver attenuation values from computed tomography were used to characterize fatty liver disease in 2634 people. A simple indicator of fatty liver disease, the concentration of alanine transaminase, was assessed in 5908 individuals. A food frequency questionnaire was used to evaluate the intake of diet soda and sugar-sweetened beverages. The participants were classified as either non-consumers or as drinkers of diet soda or beverages sweetened with sugar. They found that regular drinking of sugar-sweetened beverages was linked to an increased risk of fatty liver disease, especially in those who were overweight or obese. However, regular consumption of diet soda did not correlate with any measures of fatty liver disease ^[11].

NAFLD AND EXERCISE INTERVENTIONS

Planned, structured, and repetitive physical activity is referred to as exercise, and its purpose is to either maintain or improve physical fitness ^[12]. Exercise reduces the buildup of fat in the liver, which has therapeutic effects for NAFLD. In a study conducted by min-sun kwak et al on preventive effect of sustained physical activity on the incidence of non-alcoholic fatty liver disease, they examined the potential impact of baseline PA and follow-up PA changes on incident non-alcoholic fatty liver disease. Participants who participated in voluntary follow-up between 2011 and 2013 (median 4.42 years) and had health examinations between 2007 and 2008 were enrolled. NAFLD was characterized as incident NAFLD if it was present on ultrasonography follow-up after it was absent at baseline. At baseline and follow-up, PA was assessed using a comprehensive questionnaire-based metabolic equivalent, and the difference was computed at the follow-up. From the 1373 participants, 288 (21.0%) experienced NAFLD. At baseline, total PA and leisure-time PA had an inverse relationship with incident NAFLD. They found that when age, gender, body mass index, smoking, hypertension, diabetes, and diet were taken into account, a decrease in PA at follow-up was linked to an increased risk of incident NAFLD ^[13]. Shira zelber-sagi et al, conducted a study on effect of resistance training on non-alcoholic fatty liver disease a randomized clinical trial. The trial was completed by thirty-three patients in the RT arm and thirty-one in the stretching arm. And found that hepatic fat content improves after three months of RT, while ferritin and body composition also show positive changes. RT might be used in addition to NAFLD treatment ^[14]. In another study by ki-chul sung et al, on effect of exercise on the development of new fatty liver and the resolution of existing fatty liver. Ultrasonography with a 3.5MHz probe was used to identify liver fat both at baseline and during the five-year follow-up. And concluded that over a five-year follow-up period, moderate to intense exercise is helpful in lowering the chance of developing new fatty liver

or increasing the resolution of existing fatty liver ^[15]. Christain thoma et al, conducted a systematic review on lifestyle interventions for the treatment of non-alcoholic fatty liver disease in adults. Found 23 studies to include, only six of which were randomised and seven of which included control groups. Eleven groups were given diet-only treatments, two groups received diet and exercise only, and 19 groups received both diet and exercise. Research has often demonstrated drops in liver fat and/or liver aminotransferase levels, with weight loss showing the highest association. After intervention, most trials also showed improvements in insulin sensitivity and glucose management also. Changes in lifestyle that resulted in weight loss and/or increased physical activity were consistently associated with decreased liver fat and improved insulin sensitivity and glucose management ^[16].

NAFLD AND SURGICAL INTERVENTIONS

Numerous studies have detailed the effects of weight loss surgery, such as adjustable gastric banding (AGB), sleeve gastrectomy (SG), and Roux-en-Y gastric bypass (RYGB), on non-alcoholic fatty liver disease (NAFLD). Robert caiazzo et al, performed a comparative study on roux-en-y gastric bypass surgery versus adjustable gastric banding to reduce non-alcoholic fatty liver disease: a 5-year controlled longitudinal study. Participants included 1236 obese individuals (body mass index = 48.4 ± 7.6 kg/m) who were enrolled for up to 5 years following RYGB in prospective longitudinal research. And found that all NAFLD markers improved following surgery and improved considerably more following RYGB than following AGB, according to mixed model analysis ^[17].

CONCLUSION

In short, this review article found that non-alcoholic fatty liver disease (NAFLD) emphasizes the significant impact of lifestyle interventions, particularly weight loss, on improving liver health. It highlights that both dietary modifications and increased physical activity are crucial in reducing liver fat and enhancing insulin sensitivity. The findings suggest that structured weight loss programs, whether through diet alone, exercise, or surgical interventions, lead to marked improvements in NAFLD markers. All inclusive, this review point up the importance of adopting healthier lifestyle choices to manage and potentially reverse the effects of NAFLD effectively.

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CONFLICT OF INTEREST

There is no conflict of interest

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