EFFECT OF DIFFERENT AEROBIC EXERCISES TRAINING ON QUALITY OF LIFE IN NON ALCOHOLIC FATTY LIVER OBESE PATIENT

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ABSTRACT
The study compared sprint interval training with moderate intensity cycling training in nonalcoholic fatty liver quality of life. This study was completed. Sixty female nonalcoholic fatty liver spaitents, ranging in age from 40 to 50 years old, were randomly assigned into two equal groups at Hehia hospital in Hehia city El Sharkia. For three months, the first group (A) did a moderate intensity cycle three times each week. The second group (B) did sprint interval training exercises three times a week and three times a month. Before and after 3 months, the chronic liver disease questionnaire was measured. From December 2020 until April 2021, the research was conducted. It was found that sprint interval and moderate intensity cycle training had a significant effect on improving quality of life in fatty liver patients and higher significant effect of sprint interval than moderate intensity cycle training on improving quality of life in fatty liver patients.

Keywords: sprint interval, moderate intensity exercise, quality of life, fatty liver

1-INTRODUCTION
Increasing obesity has made nonalcoholic fatty liver disease the most common chronic liver disease increasing inflammatory form nonalcoholic steatohepatitis increasing etiology of end-stage liver disease and hepatocellular carcinoma (Dirk, 2018).

Increased liver transplantation rates are linked to an increase in the prevalence of nonalcoholic steatohepatitis, which is also linked to cardiovascular disease, the leading cause of mortality (James, 2018).

NASH hazard factors are circumstances that increase the risk of developing end-stage liver disease, since NASH leads to hepatocellular cirhosis, which leads to hepatocellular carcinoma and a higher mortality rate (Rayerson, 2016).

Hepatocellular injury as a result of increased macrophage levels, inflammatory process, and activated innate immune system are all factors that contribute to a significant rise in liver enzymes (QH, et al, 2015).

Cirrhosis can be avoided by preventing nonalcoholic simple fatty liver disease (NASFL) from developing to nonalcoholic steatohepatitis (NASH). The only thing that kept NASFL from developing to NASH was vigorous physical exercise. To treat NASH, higher-intensity physical exercise may be required (Tsunoda K et al, 2016).

Pro-inflammatory mediators (cytokines) have a role in the progression of steatosis to NASH, which is expected to become the main cause of liver transplantation in the United States by 2020. This may be avoided by including aerobic exercise training into your daily routine (El-Kader SMA et al 2014).
Diet and lifestyle modification leading to weight loss of 10% or more has been proven to achieve resolution of nonalcoholic fatty liver >90% of patients. To meet this weight loss threshold using medications, such as pioglitazone, vitamin E, or the bile acid derivative obeticholic acid, has been effective only in up to 45% of patients (Vilar, 2015).

Physical inactivity and decreased cardiorespiratory fitness are linked to increased NASH severity. Sedentary persons have a higher chance of having a fatty liver than weight-matched physically active individuals in obese adults. So that exercise can help with NAFLD and lower cardiovascular disease risk factors in NASH patients, such as diabetes and hypertension (Palve, et al., 2017).

Physical activity has a significant impact on the treatment of liver steatohepatitis. Aerobic and resistance exercise enhance insulin resistance, liver mitochondrial function, and inflammatory cascade activation, all of which lower hepatic fat accumulation (Dirk, 2018).

II- MATERIALS & METHODS

Sixty female nonalcoholic fatty liver patients, ranging in age from 40 to 50, were chosen from Hehia hospital in El Sharkia, Hehia. They were split into two equal groups at random. The first group (A) did a moderate intensity cycle three times a week for three months. The second group (B) did sprint interval training exercises three times a week and three times a month. Before and after 3 months, the chronic liver disease questionnaire was measured.

- Treatment Procedures

  Participants were randomly assigned to one of two equal groups: group A received moderate intensity cycle training and group B received sprint interval training. Three times each week for twelve weeks, at 65-75 percent of target heart rate for thirty minutes. Sprint exercise (short bursts of strong activity interrupted by intervals of rest or low-intensity exercise) was given to Group B. Begin with 30-second ‘all out' efforts followed by 4 minutes of low-intensity active recovery, progressively increasing length until you reach thirty minutes for the session. Three times each week at 90-95 percent of goal heart rate for twelve weeks.

- Statistical analysis

  The statistical analysis was carried out with the help of the statistical SPSS software version 20 for Windows (SPSS, Inc., Chicago, IL). Descriptive statistics, such as the mean and standard deviation for age BMI, were calculated. For quality of life, a paired t-test was used to compare pre and after therapy within groups A and B. All statistical tests have a significance threshold of p 0.05.

III- RESULTS

In both groups, demographic and other baseline data were collected. Table 1 shows a summary of the subjects' demographic data and clinical characteristics at the start of the research, such as age and BMI.

Table 1. Physical characteristics of participants in both groups (A&B).

<table>
<thead>
<tr>
<th>Items</th>
<th>Group A</th>
<th>Group B</th>
<th>Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>44.13±2.09</td>
<td>43.93±2.31</td>
<td>0.35 0.727 NS</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>33.53±1.50</td>
<td>33.66±2.52</td>
<td>-0.249 0.804 NS</td>
</tr>
</tbody>
</table>

*SD: standard deviation, P: probability, S: significance, NS: non-significant.

- Quality of life

  In comparison to pre-treatment, there was a substantial increase in quality of life (P-value =0.0001*). With (p=0.008), there was significant increase in flavor to group B in the mean values of the "post" test between the two group as stated in table (2).

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**Table 2.** Mean ±SD and p values of Quality of life pre and post test at both groups.

<table>
<thead>
<tr>
<th>Quality of life</th>
<th>Pre test</th>
<th>Post test</th>
<th>MD</th>
<th>% of change</th>
<th>p- value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean± SD</td>
<td>Mean± SD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group A</td>
<td>101.26±9.95</td>
<td>129.6±12.9</td>
<td>-28.33</td>
<td>27.97 %</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Group B</td>
<td>100.4 ±9.45</td>
<td>138.16±11.37</td>
<td>-37.77</td>
<td>37.61 %</td>
<td>0.0001*</td>
</tr>
<tr>
<td>MD</td>
<td>0.87</td>
<td>-8.57</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p- value</td>
<td>0.731</td>
<td>0.008*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant level is set at alpha level <0.05  
SD: standard deviation  
p-value: probability value

**IV- DISCUSSION**

NAFLD hepatic pathogenic states are inversely associated to levels of physical activity and fitness, according to cross-sectional research. The present study aims to see if sprint interval or moderate intensity cycle training is more successful at improving quality of life. The study confirmed that both sprint interval more effective than moderate intensity cycle training in improving quality of life.

Chalasani, 2015 reinforced our result by confirming that physical activity as a primary therapy approach for NASH, regardless of the type of exercise. Easl-Easd, 2016 also reported that the amount of fat in the liver has been altered by various workout routines, with no preference for one kind over another. As a result, the exercise programme should be customised to the preferences of the patients, and they should continue to exercise.

Motiani K et al., 2019 added that when compared to SIT, MICT was found to be more effective in enhancing hepatic insulin sensitivity.

Oh S et al., 2015 explained why exercise has greater effect on NASH patient as inflammation and oxidative stress are reduced by vigorous exercise, and fatty acid metabolism is altered in NASH patients. OH S, 2017 also reported that serum cytokines and inflammatory markers (IL-6, IL-8, TNF-, ferritin, CRP) were shown to be considerably lower in numerous trials, along with a drop in liver transaminases. TLR4, TLR5, CD11b, and CD14 expression on PBMCs were reduced after a high-intensity aerobic exercise programme, indicating an improvement in innate immune activation and inhibiting the macrophage inflammatory response.

Oh S et al., 2017 reported that high intensity inerval aerobic training is a new exercise treatment option that uses short duration, high-intensity aerobic exercise and recovery time with low-load breathing. It is better for patients who do not have much time, as well as for cardiovascular disease and metabolic syndrome.

The study results was consistent with Hallsworth K, 2015 who reported that in individuals with NAFLD, modified HIIT not only lowers liver fat, improves body composition, and improves cardiac function, but it's also regarded as an alternative therapy plan.

Timothy A., et al., 2021 confirmed that, those who aren't fat can use HIIT to boost their liver's metabolic health. Also Seyyed A and Ghajari H, 2019 reported that females who are not obese, high-intensity interval training (HIIT) is one of the most effective ways to improve liver function. Additionally, it improves general well-being.

The study results was consistent with Motiani X, 2019 who reported both sprint interval training and moderate-intensity continuous training (MICT) enhanced liver fat content and LDL profile. MICT has a greater impact on increasing insulin sensitivity in the liver than sprint interval training.

In individuals with NAFLD, high intensity interval training reduces hepatic insulin sensitivity and hepatic lipogenesis more efficiently than traditional exercise (Hamasaki H, 2019).

Sprint interval training (SIT) is a new type of exercise that uses high intensity for a short period of time. In both healthy and overweight people, it has a significant beneficial effect on Insulin Sensitivity. SIT increases VO2 peak and lowers intrahepatic lipid IH in 6 weeks without affecting body weight or insulin sensitivity (King A, et al., 2017).
Simón, 2016 confirmed that sprint interval training is a form of high-intensity interval training that uses a high-intensity effort session and a high power output to improve aerobic capacity, cardiovascular function, health, and blood lipids.

The results of the study were contradicted with N A Smart, et al., 2018 who reported that although several studies have indicated a substantial impact of sprint interval exercise on liver enzyme decrease, some have found no change.

Finally, exercise should be of the main line of treatment protocol in management NASH patient whatever which type of exercise. Sprint interval exercise training was more preferred in improving cardiopulmonary function on NASH patient.

V- CONCLUSION

It was found that sprint interval and moderate intensity cycle training had a significant effect on quality of life in non-alcoholic fatty liver patients, higher significant effect of sprint interval than moderate intensity cycle training on improving quality of life in non-alcoholic fatty liver patients.

- Authors contributions:
  RHE devised the experiment, carried it out, and authored the paper. The experiment was overseen by HAA, who also evaluated the article. The experiment was overseen by MWF.

REFERENCES