Effect of Nordic and Normal walking on coronary risk factors among middle aged obese population: Comparative Study

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Abstract

Background: In recent years, obesity significantly increased in all the age groups due to sedentary lifestyle. It can result into chronic heart disease. So walking is very beneficial for every individual therefore this study is aimed to compare the effect of Nordic and Normal walking on coronary risk factor in middle aged obese population. 32 middle aged obese individuals were participated in this study they were divided into 2 group. One group performed Nordic walking and other Normal walking and evaluate the efficiency of Nordic and Normal walking for the coronary risk factor.

Objective: To assess the W-H Ratio BMI, HDL and LDL level

To find out the pre and post effect of Nordic and normal walking on the coronary risk factors.

Methodology: The study subjects were 32 middle aged obese individuals. They were divided into 2 groups. The primary intervention to Group A consist of a Nordic Walking and Normal walking for group B. Individuals were selected according to inclusion criteria age between 45-65 years, Body Mass Index ≥30 kg/m^2 , Waist – Hip Ratio > 0.9 cm for men and 0.8 cm in female, HDL < 40mg/dL, LDL > 130 mg/dL and exclusion criteria was individuals taking medication which influence the variable measured, any orthopedic condition that limit the exercise, unstable angina, uncontrolled hypertension – SBP ≥ 200 mmHg and DBP ≥110 mmHg.

Result: Statistical analysis for BMI, Waist – Hip ratio, LDL and LDL level was significant (P value = 0.0001) in individuals performed Nordic walking. In normal walking P value is changes in BMI, W-H ratio, HDL and LDL level which was not significant.

Conclusion: From this study, it can be concluded that the Nordic walking reduces the coronary risk factor in middle aged obese population than the normal walking.

Keywords: *Nordic walking, Coronary risk factors – BMI, HDL, LDL, WHR , middle Age . Obesity*

Introduction

Obesity is a medical condition in which excess body fat has accumulated to the extent it may have a negative effect on health [1]. In recent studies have reported globally, more than 1.9 billion adults are overweight and the 650 million people are obese and approximately 2.8 million deaths are reported due to obesity. Its due to the sedentary life style, consumption of high energy dense food, lack of physical activity. In India prevalence of obesity and central obesity varies from 11.8% to 31.3% and 16.9% to 36.3% respectively and in urban population prevalence of obesity was12.7% compared to 5.4%in rural area[1] According to WHO obesity defined as BMI greater than 30kg/m^2 is significant and it is linked to health problems such as increased LDL

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level, total cholesterol level, reduce insulin sensitivity and diabetes, CVD, cancer and sleep apnea, joint pain such as OA. In previous studies they show that it affects the physical functioning, role limitations due to physical problems, bodily pain. They facing difficulty in walking, climbing upstairs, shortness of breath while walking [12] and its negative impact on health-related quality of life in all the domains including physical, social and mental functioning.

Nowadays, walking is highly recommended in obese population for the physical reconditioning. It is an rhythmic, dynamic, aerobic activity, which can be provide a training effect. There are various health benefits of walking such as it increases the cardiovascular and pulmonary fitness, individual's aerobic capacity, management of conditions like hypertension, high cholesterol, joint and muscular pain and stiffness and diabetes, Stronger bones and improved balance, Increased muscle strength and endurance and Reduced body fat.

The many previous researches proved that walking is beneficial in weight reduction which has positive impact on the coronary risk factors.[1] But, in middle age i.e age group between 45-65 years there is change in musculoskeletal, cardiovascular system which reduces the exercise capacity. The middle age obesity has an important role in atherosclerosis and coronary artery disease And also obesity is main risk factor for the larger joint (Eg. Knee joint) osteoarthritis.[3] Walking is a popular form of exercise but weight bearing is more during walking so it may be a critical source of biomechanical loads that link obesity and OA.

. There are few studies have been conducted on how obesity affects the biomechanics in walking. In Spyropoulos et al. compared the stride length and joint angle difference between obese and normal weight men. They found that the obese males walked slower (1.09m/s) with wider steps and similar knee flexion. The peak knee flexion is during the loading response of the gait cycle increases as the walking speed increases. This will result in obese men might adopt a more flexed knee during stance phase.[3] In Messier et al study they found that absolute peak vertical ground reactional force increased in almost directly proportional to the body weight. So as the weight increases the GRF increased over the larger joint this will increases pain on OA knee.

So, walking with the help of Nordic poles is more beneficial in obese population. [3,4] Nordic walking has benefits on obese population. The walking distance and speed of walking increase which help in weight reduction. In , Kocur et.al. reported significant effect on cardiovascular adaptation to effort, it mainly decreased heart rate compared to walking without poles.[3] Walking with the help of poles uses the body's various muscle group than the normal walking. The use of arm muscles mainly triceps and the shoulder girdle muscle due to arm swing while walking. Therefore, chest expansion is more in Nordic walking which help in reducing symptoms of dyspnea while walking in obese population. Also, walking with the poles reduces the joint load, maintain balance and co-ordination, improves the posture while walking than the normal walking.

Material and Methodology

Ethical clearance was obtained from the institutional ethical committee, KIMSDU, karad This study included the 32 obese individuals according to inclusion and exclusion criteria and the were divided into 2 groups. Group A (n= 16) and group B(n = 16). The study protocol was approved by the regional ethical committee. Individuals were selected according to inclusion criteria age between 45-65 years, Body Mass Index (BMI) ≥30 kg/m^2 , Waist – Hip Ratio (WHR) > 0.9 cm for men and 0.8 cm in female, HDL < 40mg/dL, LDL > 130 mg/dL and exclusion criteria was individuals taking medication which influence the variable measured, any orthopedic condition that limit the exercise, unstable angina, uncontrolled hypertension – SBP ≥ 200 mmHg and DBP ≥110 mmHg.

Group A was given Nordic poles for walking. And they were perform walking including warm up and cool down period 10 min. 30-45 min/ day walking for 3-4 time/ week for 12 weeks. Group B perform Normal walking and it also include warm up and cool down period 10 min, walking 30-45 min/ day for 3-4 times/ week for 12 weeks.

Outcome Measures:

The outcome measure was taken for this study were

BMI

Waist – Hip Ratio

HDL and LDL level

Statistical Analysis

Statistical analysis of the recorded data was done by using the software SPSS version20.

16 subjects were successfully completed assessment and the 12-week Nordic walking program. 3-4 times / week The result showed that mean BMI per 31.92 kg/m^2 and post intervention program 29.13 kg/m^2, WHR Previous 1.97cm and Post 0.8cm, HDL Previous 47 mg/dL and post 50.18mg/dL , LDL 126.44 mg/dL and post 103.94 mg/Dl

Table no 1 – Pre and Post BMI score within groups

Group	Pre treatment	Post treatment	P Value
	Mean ±SD	Mean ±SD	
A	32.79 ±1.66	29.13 ±1.57	<0.0001
B	32.8 ± 2.99	31.1 ±1.36	0.0042

Table no 2 – Pre and Post Waist – Hip ratio within groups

Group	Pre treatment	Post treatment	P Value
	Mean ±SD	Mean ±SD	
A	1.97 ± 30.47	0.8 ±30.52	<0.0001
B	1.05±2.99	1.00±0.07	0.26

Table no 3 – Pre and Post HDL level within groups

Group	Pre treatment	Post treatment	P Vaue
	Mean ±SD	Mean ±SD	
A	47.00 ± 20.66	52.18±4.7	<0.0001
B	41.46±4.74	46.41±4.74	0.0001

Table no 4 – Pre and Post LDL level within groups

Group	Pre treatment	Post treatment	P
	Mean ±SD	Mean ±SD	
A	126.44 ± 7	103.9 ± 6.76	<0.0001
B	121.93±8.57	104.47± 6.98	0.0001

Result

Thirty-two middle aged obese individuals participated in this study. Their basic BMI, W-H ratio and biochemical data are represented in Table no 1,2 and Table no 3,4 respectively. After 12 weeks of exercise performed according to Nordic and Normal walking. There is significantly reduction in BMI (on average 3.66 kg.5.7%) and W-H ratio (on average by 1.17) were observed in Nordic walking. None of the participants showed a body weight increases. In biochemistry results statistically drops in LDL (-22.54mg/dL) and increases HDL (8.5mg/dL)

In Normal walking the statistics are BMI (on average 1.7 kg. 2.3%) and W-H ratio (on average 0.05) in biochemistry result LDL drops(-17.93mg/dL) and increases HDL (5.18mg/dL)

Discussion

Walking is the aerobic activity which can produce the necessary intensity to provide a training effect.[5] The walking with the specially designed poles, called Nordic walking and it is largely used by the sports players as a part of exercise training. So, it is very effect mean of exercise in middle aged obese individuals which helps in the weight reduction as well as improves the coronary risk factors.

The present study aimed to compare that the effect of Nordic and Normal walking on the coronary risk factor in the middle-aged obese population.

The objectives are to assess the BMI, Waist hip ratio, HDL and LDL level and To find out the pre and post effect of Nordic and normal walking on the coronary risk factors in middle aged obese population.

This study done was done in 12 weeks of duration with sample size 32 and age group 45-65 years. Later they were divided into 2 groups. One group performed walking with the help of poles and other without poles. Complete session required 60 min 10 min of warm up and cool down period 30-45 min of walking and other group same.[6] Consent from was taken from subjects and assessment were done pre and post treatment.

In this study, we observed a significant reduction in BMI, Waist – Hip ratio, increased in HDL level and reduced the LDL level in group A than group B in accordance to other study[7,8,] Moreover, the result demonstrate that there is no significant improvement in coronary risk factor in Normal walking. Weight reduction after 10-12 weeks of Nordic walking was also observed by other group of researchers [9]

As mentioned above the comparative study of 12 weeks of Nordic walking program had positive effect on BMI (table 1) and WHR (Table 2) than normal walking. The Nordic walking program increases the HDL (table 3) and reduces the LDL (table 4).

Nevertheless, the complete clinical result of the Nordic walking program was associated with its hypolipidemic effect, and can be expressed as the reduce the risk of cardiovascular disease at least 20-25% (10% depend on LDL reduction and 10-15% dependent on HDL increase) [10]

Conclusion

From this study, we can conclude that the Nordic walking is an effective type of physical training which help to reduce the coronary risk factor in middle aged obese population.

Abbrivations:

BMI – Body mass index

WHR – Waist – Hip ratio

HDL - High density lipoprotein

LDL – Low density lipoprotein

Conflict of Interest: There is no conflict of interest concerning the content of the study.

Source of Funding: This study was self-funded

Ethical Clearance: The study was approved by the institutional ethics committee of KIMSDU.

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