Brief Communication

Effect of mild physical activity in obese and elderly women with type 2 diabetes

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ABSTRACT

Background: Elderly, obese women with diabetes who have limitations in mobility often are unable to walk for a sustained period of time. We need to find a way to increase physical activity in these subjects. **Aim:** To evaluate the effect of low-intensity, repetitive, home-based walking regimen on glycemic control in elderly, obese women with diabetes. **Research Design:** A 24-week open, 2 arms, and prospective study. **Materials and Methods:** A total of 18 elderly people with type 2 diabetes were recruited. Nine subjects were instructed to walk for 5 minutes per hour for most waking hours for 24 weeks. The rest were given standard advice regarding diet and exercise. Glycemic control, HbA1c, weight, BMI, subjects' physical fitness, QOL, and distance walked in 6 minutes were determined before and after the intervention. **Intervention:** A mild physical activity of 5 minutes walking/hour everyday and antidiabetic medications prescribed as per clinic procedure. **Results:** There was a significant reduction in HbA1c within the study group (8.76% to 7.43%) ($P = 0.08$) *vs* rise in the control group (8.34% to 9.34%) ($P = 0.07$). There was a significant weight loss within the group which exercised ($P = 0.01$), but there was no significant difference between the groups. **Conclusion:** Repetitive low-intensity activity is effective in improving glycemic control and weight management in elderly obese women.

Key words: Obese, elderly women, type 2 diabetes, mild physical activity, glycemic control

Introduction

Older women in lower socioeconomic groups in South India are not accustomed to the concept of exercise. Diabetes patients in this group usually ignore advice to walk daily for a sustained period of time. Reasons are fear of falls, poor visions, poor mobility, OA of knees, poor physical fitness, unfamiliarity with footwear, poor roads, etc. Our study attempts to increase physical activity in these women with a view of achieving better glycemic control.

Objective

To evaluate the effect of low-intensity, repetitive, home-based walking regimen on glycemic control in elderly obese diabetic women.

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Research design and methodology

A 24-week open, 2 arms, prospective pilot study was conducted after getting approval from the Institutional Ethics Committee among 18 women (9 cases and 9 controls) aged >60 years with type 2 diabetes. Written informed consent was taken from the subjects in their native language. Screening procedures included confirmation of diabetes by a fasting plasma glucose >110 mg/dl??(126), BMI >30 kg/m^2 and physical examination. Exclusion criteria included individuals with type 1 diabetes, diabetic foot ulcer or insensate foot, and any unstable chronic conditions including dementia, psychiatric disorders, and history of major surgeries in the past three months. The study group was instructed on mild physical activity of five minutes walking/hour everyday for 24 weeks and they were provided with a diary to document the same which was reviewed at every four weeks interval. The control group was given standard advice regarding diet and exercise. At baseline glycemic index??control, physical fitness using the

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Table 1: Characteristics profile

Characteristics	Cases (Values in Mean ± S.D)			Controls (Values in Mean ± S.D)		*P* value
Age (Years)	60.8 ± 2.31			61.7 ± 3.27		0.31
Weight (kg)	72.88 ± 7.20			76.3 ± 10.90		0.48
BMI (kg/m^2)	33.79 ± 2.69			34.90 ± 3.84		0.65
Duration of diabetes (Years)	9.22 ± 6.41			12.2 ± 7.38		0.59
Final HbA1c (%)	7.43 ± 0.81			9.13 ± 1.76		0.02
	Before	**After**	***P* value**	**Before**	**After**	***P* value**
HbA1c (%)	8.76±1.55	7.43±0.81	0.08	8.34± 0.91	9.34±1.76	0.07
Weight (kg)	74.1±7.80	71.7±7.79	0.01	76.9±10.4	77.24±10.26	0.43
Distance covered by walk test (meters)	290.5±46.22	347.5±46.98	0.08	322±58.46	336.11±47.2	0.57
EQ5D VAS	46 ± 6.9	60.5±14.2	0.01	48 ± 6.32	55 ± 9.72	0.08

six minute walk test and quality of life using the EQ-5D questionnaire of all subjects was assessed and the same was recorded at the end of the study.

Intervention

A mild physical activity of five minutes walking/hour everyday and antidiabetic medications prescribed as per clinic procedure.

Statistical analysis

Statistical analysis was done using SPSS version 16.0. Difference in parameters between the 2 groups at baseline and 6 months were analyzed using non-parametric test (Mann-Whitney test) and the difference in parameters within the group before and after the invention was analyzed using non-parametric test (Wilcoxon signed rank test). *P* value <0.05 was considered statistically significant.

Results

Shown in Table 1

Discussion

It is well known that exercise reduces insulin resistance and contributes to reduction in hyperglycemia.[1] In our study, the exercised group showed a significant reduction in mean HbA1c levels, suggesting a beneficial effect on glycemic control by regular exercise *vs* a significant rise in control group. The fall in HbA1c was significant within the study group ($P = 0.08$) and also between groups ($P = 0.02$). This decrease in HbA1c is in accordance with the earlier study of Canche and Gonzalez,[2] demonstrating reduction in HbA1c levels with exercise. There was a significant weight loss within the group which exercised ($P = 0.01$). This is in agreement with an earlier study,[3] which has shown that 12-week supervised exercise program causes reduction of body weight and fat mass. This decrease in HbA1c and weight could be due to increased resting substrate oxidation as a result of physical activity which in turn could have promoted lipid utilization in skeletal muscle facilitating the reversal of insulin resistance. There was also a significant increase in the distance walked in the 6-minute walk test within the study group. A significant increase in QOL scores was observed in both the groups. Increased attention given as part of the study may account for this observation.

In our study, patients performed physical activity which was less than 3 METs, that is less than moderate intensity activity for short periods – 5 minutes – through the day, entirely unsupervised. In spite of such low levels of exercise, significant weight loss, improvement in glycemic control, and physical fitness occurred. The results of our study is supported by the study of Klaas R. Westerterp, who showed that short periods of low-intensity activity influenced total energy expenditure and increased the basal metabolic rate.[4] It was also speculated that moderate intensity activities are better tolerated than high-intensity activities, especially by aged and obese individuals. It could certainly explain the results of our study. In conclusion, our study shows that repetitive low-intensity activity is effective in improving glycemic control, physical fitness, and weight management in elderly obese women.

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