

## A COMPARATIVE STUDY OF EFFECT OF SHORT WALK AFTER MEALS TO THAT OF SINGLE DAILY HALF AN HOUR WALK IN TYPE 2 DIABETIES

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### ABSTRACT

#### BACKGROUND

Regular physical activity plays a key role in management of type 2 diabetes. So, a randomised crossover study was conducted specifying the timing of walking in relation to meals, which enhanced the benefits of walking in controlling the type-2 diabetes.

#### MATERIALS AND METHODS

The study was conducted on a total of 50 adults with type-2 diabetes aged between 45 years to 70 years. They are divided into two groups. Group I with 25 adults were assigned a 30-minute morning walk each day, whereas group II with 25 adults were assigned a 10-minute walk following each main meal for 15 days and a 30 days break was taken and then again the participants were crossed over to another group. Same is repeated for another 15 days.

#### RESULTS

Significantly, there is decrease in fasting blood glucose levels in both groups, but there is greater decrease in fasting blood glucose levels in the group, which was assigned a 10-minute walk after each major meal, that is about 10% to 20% with an average of 12% compared to another group's fasting blood glucose levels assigned with a single 30-minute morning walk.

#### CONCLUSION

A short stroll after every meal could reduce need for insulin injections, which can help type-2 diabetic people for better management of their blood sugar levels and weight.

#### KEYWORDS

Type-2 Diabetes Mellitus, Crossover Study, Fasting Blood Glucose, Hyperglycaemia.

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#### BACKGROUND

Postprandial glycaemia contributes considerably to the overall hyperglycaemia of type-2 diabetes mellitus.<sup>1,2</sup> Post-meal high blood sugar is a key risk factor in the progression from impaired glucose intolerance to type-2 diabetes and cardiovascular disease. Older people with type-2 diabetes maybe particularly susceptible to poor blood sugar control after meals because inactive muscles contribute to insulin resistance. The problem is compounded by slow or low insulin secretion by pancreas, which often occurs as the body ages. Walking after meals reduce glucose levels by more than half in both healthy people and diabetic patients. Minimal activity sustained for 30-minutes lowers post-meal glucose concentrations. Such activity has little or no risk for almost everybody. The muscle contractions connected with short walks were immediately effective in blunting the

potentially damaging elevations in post-meal blood sugar commonly observed in type-2 diabetic people, thus preventing damage to internal organs and blood vessels. Researches on the effect of walking on diabetes indicates significant benefits from walking in maintaining normal blood glucose levels over the long term in type-2 diabetic patients. They did not look specifically at meal-related walking, but we have no reason to think that the health benefits would not occur when walking is under taken after meals. Benefits would include weight and body mass index being more healthy and likely less cardiovascular events and all-cause mortality. The current physical activity guidelines for people with type-2 diabetes mellitus promote at least 150-minute activity per week.<sup>3</sup> Studies of a single meal or over a single day suggest that post-meal physical activity can reduce blood glucose levels.<sup>4,5,6,7</sup>

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#### Aims and Objectives

1. To determine the effect of walking on blood glucose levels in patients with type-2 diabetes.
2. To show that fasting blood glucose levels are better maintain within the normal range in type-2 diabetic patients with a short 10-minute walk following each main meal when compared to a 30-minute morning walk each day.



**MATERIALS AND METHODS**

The randomised crossover study was conducted among 50 type-2 diabetic subjects attending diabetic clinic organised by Department of General Medicine at Government General Hospital, Vijayawada, Andhra Pradesh. Type-2 diabetic people with coexisting hypertension, fasting blood glucose levels greater than 180 mg/dL and unable or unwilling to comply with required physical activity were not included. The subjects were randomly assigned to one of the two groups, Group I and Group II.

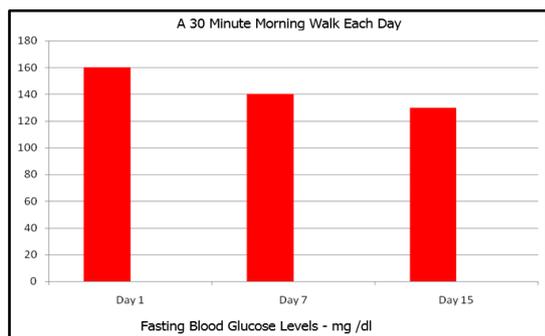
Group I - A 30-minute morning walk each day.

Group II - A 10-minute walk following each main meal.

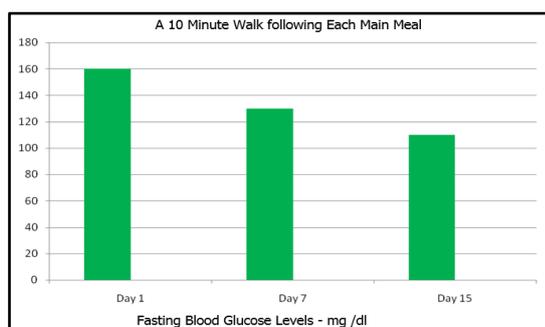
Each intervention lasted 15 days followed by a 30-day break. The participants then crossed over to the other group, they had not yet received. The fasting blood glucose levels were tested using glucose meter on day 1, day 7 and day 15 in both groups.

**RESULTS**

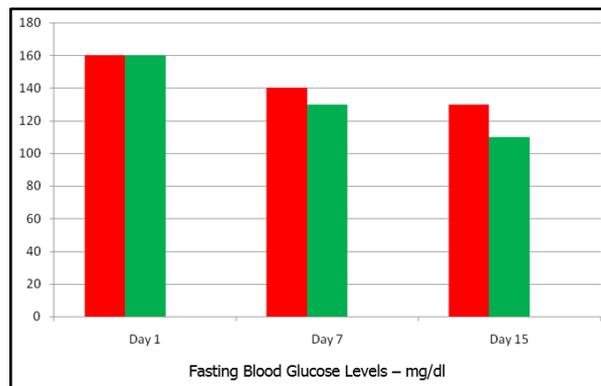
In this study, the participants act as their own controls and effect seen is mainly due to walking rather than the influence of other factors like dietary and physical activities. There is decrease in fasting blood glucose levels on day 7 and day 15, when compared to day 1 fasting blood glucose levels in both groups. The study found that when participants walked after meals, the level of fasting blood glucose was 10% to 12% lower than in those who went for a single walk each day. The results were analysed statistically by using t-test. Fasting blood glucose levels were decreased significantly after 10-minute post-meal walking in both groups (p-value <0.001) when compared to single 30-minute morning walk, Figure 1, Figure 2 and Figure 3.



**Figure 1. Fasting Blood Sugar Levels on Day 1, Day 7 and Day 15 in Group I and II**



**Figure 2. Fasting Blood Sugar Levels on Day 1, Day 7 and Day 15 in Group I and II**



**Figure 3. Comparison of Fasting Blood Glucose Levels in Type-2 Diabetic Patients after a 30-Minute Morning Walk and a 10-Minute Walk Following Each Main Meal**

**DISCUSSION**

Reduction of postprandial glucose is regarded as an important target in the management of type-2 diabetes mellitus, given its independent contribution to glycaemic control and cardiovascular risk.<sup>1,8,9</sup> Physical activity guidelines are a cornerstone of advice to prevent and manage type-2 diabetes mellitus.<sup>10</sup> Physical activity has been shown to lower blood glucose levels,<sup>11,12</sup> reduce cardiovascular risk by favourably influencing several metabolic risk factors<sup>13,14</sup> and help reduce body fatness in many people with type-2 diabetes mellitus who are obese.<sup>15,16</sup> When we do moderate exercise like walking that makes our heartbeat a little faster and breathe a little harder, the muscles use more glucose and overtime this can lower the blood glucose levels and makes the insulin in our body work better. There are a few ways that exercise lowers blood glucose that is, insulin sensitivity is increased, so muscle cells are better able to use any available insulin to take up glucose during and after activity and when muscles contract during activity, the cells are able to take up glucose and use it for energy whether insulin is available or not. This is how exercise can help lower blood glucose in the short term and when diabetic patients are active on a regular basis, it can also lower A1c. Thus, physical activity can lower blood glucose levels up to 24 hours or more after workouts by making body more sensitive to insulin. The present study which involved 50 type-2 diabetic adults found that taking shorter, more frequent walks immediately after meals reduce fasting blood glucose levels by around 10% to 12% than with a single 30-minute walk. The evening post-meal walk was the most effective in lowering blood sugar levels for a full 24 hours. Researchers say current physical activity guidelines should be changed to specifically include post-meal activity especially after meals with lots of carbohydrates.

**CONCLUSION**

This study can help the current physical activity guidelines to specify post-meal activity particularly when meals contain much carbohydrate in type-2 diabetic subjects. The findings of this small study can help to an inexpensive prevention strategy for prediabetes, which can develop overtime into

type-2 diabetes. We can't be sure if the benefits of a post meal walk are long-term because of the short duration of the study. From this study, 10-minute walk after a meal can significantly lower the blood glucose levels, thus emphasising that simple lifestyle changes would benefit people with diabetes.

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