

# Evaluation on 45 Minutes Walking Exercise Effect on Fasting Blood Sugar in Type II Diabetic Patients: A Teaching Hospital Based Study

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## ABSTRACT

**Background:** This study was designed to compare the Fasting Blood Sugar samples were taken before and after walking exercise for 45 minutes in type II diabetic patients. **Methods:** 36 Subjects were selected purposively from the out-patient department of Hi-Tech Medical College & Hospital Rourkela according to inclusion-exclusion criteria. **Results:** Mean fasting blood sugar before & after walking for 45 minutes was  $176.5 \pm 26.2$  and  $134.6 \pm 18.06$ , which is statistically significant ( $p < 0.01$ ). **Conclusion:** Walking exercise after 45 minute was effective in reducing blood glucose levels for type II diabetic patients. Decreased Fasting blood sugar is considered beneficial in the treatment of type II diabetic patients.

**Keywords:** Fasting Blood Sugar, Walking and Type II Diabetes.

## INTRODUCTION

In the ancient Sanskrit Literature, diabetes mellitus was described as "honey-urine disease," associated with gross emaciation and wasting. Diabetes is a global endemic with rapidly increasing prevalence in both developing and developed countries.<sup>[1]</sup> Diabetes is one of the oldest diseases documented in medical literature before over 2000 years.<sup>[2]</sup> In Indian population, 61.3 million people had diabetes in 2011, which is expected to reach 101.2 million by 2030 (International Diabetes Federation) now placing India at second position in world diabetic prevalence.<sup>[3]</sup> Diabetes mellitus is a chronic disorder of glucose metabolism resulting from dysfunction of pancreatic beta cells and insulin resistance. It is still a series health problem all over the world.<sup>[5]</sup> Physical inactivity leading to increase in obesity is considered to be an important reason for the development of diabetes in various populations. The prevalence of obesity has increased considerably in many countries in recent decades and is affecting both sexes.<sup>[5]</sup> Treatment modalities of hyperglycemia

consist of a triad of drugs, diet and exercise. Each has a specific role in promoting glucose uptake and hence balancing blood glucose levels.<sup>[6]</sup> Diabetes can't be cured, but it can be controlled by other methods, such as exercise.<sup>[7,8]</sup> Regular exercise is a valuable supplement to diet.<sup>[9]</sup> The brisk walking is the best form of exercise to any type II diabetic patients. The natural walking involves large group of muscles of lower limb along with rhythmic upper body muscular work. With physical exercise, there is also increase in blood flow to the working muscle. This adaptation ensures delivery of glucose to the muscle and provides FFA, which have been released by adrenergic stimulation of fat cell lipolysis to maintain normal glycemia during exercise the increase in glucose utilization by working muscle must be balanced by an increase in hepatic glucose output. Thus, the present study focuses attention on the importance of walking effects on blood glucose level in patients' with type II diabetes.

## MATERIALS AND METHODS

The present study was conducted in Hi-Tech Medical College & Hospital, Rourkela, Odisha, India in collaboration with the department of Medicine during the period from July 2016 to March 2017. The study protocol was approved by the Ethics committee of Hi-Tech Medical College & Hospital,

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Rourkela. 36 Subjects were selected purposively from the out-patient department of Hi-Tech Medical College & Hospital, Rourkela according to inclusion-exclusion criteria. Each subject was informed in detail of its objective, the aim of the research protocol and the method to be used. Along with routine lab investigations, Fasting Blood Sugar samples were taken before and after walking exercise for 45 minutes. All the subjects with regular treatment for type II diabetes more than one and half year were selected whose physical activities were minimal in their daily life and advised them to do walking for 45 minutes. Subject's Fasting Blood Sugar levels before and after walking for 45 minutes was considered as control group and case group respectively. Estimation of blood sugar was done by GOD-POD method.<sup>[10]</sup> All the data were entered and analyzed by SPSS version 18. We used student's t-test to find the statistical significance. A P-value <0.05 was to be considered statistically significant.

## RESULTS&DISCUSSION

This present study was conducted in Hi-Tech Medical College & Hospital Rourkela on 36 type II diabetic patients in the age range of 30 to 65 years. [Table 1] shows the mean fasting blood sugar before & after walking for 45 minutes was  $176.5 \pm 26.2$  and  $134.6 \pm 18.06$ , which is statistically significant ( $p < 0.01$ ). But age, sex was found statistically not significant.

**Table 1: Showing comparison of age, sex & fasting blood sugar before & after walking for 45 minutes**

Variables	Before walking (MEAN±SD)	After walking (MEAN±SD)	p-value
Age in years	42.7±12.4	42.7±12.4	0.76
Sex (M:F)	24:12	24:12	-
Fasting Blood Sugar mg/dl	176.5±26.2	134.6±18.06	0.01*

(\*Statistically Significant at p-value <0.05)

For people with type II diabetes, exercise is nearly as important as diet in controlling the disease. And there are few forms of exercise as easy and convenient as walking. Promoting physical activity as part of a healthy lifestyle can be done by encouraging patients to be more active in daily routines and choosing options that increase movements while performing daily chores or tasks. Others clinicians may prefer the individualized approach of a structured program to ensure an increase in activity levels. Waryasz & McDermott, (2010) found that instructions for exercise are often vague and not specific and that for most people a prescription for exercise is more effective.<sup>[11]</sup> Using a prescription allows the patient to know exactly what exercise intensity, duration and activity are prescribed based on the individual need.

Although the primary outcome of HbA1c did not indicate significance between pre and posttest measures, patient's with type II diabetes gained a better understanding of the effects of exercise on other health outcomes. Implications for nursing and health care from this project are that making an effort to assess a patient's with type II diabetes physical activity level and prescribing a reasonable exercise program that increases in duration and intensity over time can assist patients to undertake a physical activity program and lose weight. Primary care providers should be encouraged to discuss physical activity with patients and help them to understand the role of physical activity in the treatment of type II diabetes.

A further increase in intensity or duration of exercise doesn't confer any significant additional benefit in terms of longevity or freedom from disease. More intense exercise confers the effects of training in terms of superior performance and higher cardio respiratory reserve. But since an average person is primarily interested only in staying healthy, intense exercise is not necessary. Exercise tends to lower the blood sugar in the diabetic in whose body there is an adequate supply of endogenous insulin. This effect is so striking and so beneficial that exercise along with diet and insulin is now accorded a definite and prominent place in the everyday treatment of diabetes.<sup>[12]</sup> The findings may also have been influenced by a close association with the participants who were motivated by the nurse practitioner to exercise but may also indicate that part of a successful walking exercise program may require social support to maintain the motivation to walk.

## CONCLUSION

In conclusion, the walking exercise for 45 minute was effective in reducing blood glucose levels for type II diabetic patients. Decreased fasting blood sugar after 45 minutes walk is due to adrenergic inhibition of insulin secretion & decrease in circulating plasma insulin level. Decreased Fasting blood sugar is considered beneficial in the treatment of diabetes mellitus. Thus, the diet being an integral component, the exercise acts as a wonderful drug in treating the type II diabetic patients.

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