

ABSTRACT

ACUTE COMPARISON OF BLOOD GLUCOSE LEVEL CHANGES BEFORE AND AFTER MODERATE INTENSITY PHYSICAL EXERCISE IN MORNING AND NIGHT

Background: According to WHO, lack of physical activity is the fourth risk factor for death in the world. Lacks of physical activity can cause several complications of disease including diabetes mellitus, obesity, and even heart disease. Moderate intensity physical exercise is known to improve blood glucose levels in patients with diabetes mellitus. However, choosing an effective time to exercise is still remain unclear. Circadian rhythm, that regulate hormones and metabolism in the body based on daily cycles (morning and night) could be the key to this problem.

Objective: This study aims to determine the comparison of changes in blood glucose levels before and after moderate intensity physical exercise in morning and night.

Method: Healthy men ($n = 34$), Age between 17-22 years old, Body Mass Index between 18.5–22.9 kg/m^2 (normal Asia), participated in morning (08.00 am) or night (20.00 pm) group. Moderate physical exercise (55- $<$ 70% of the Maximum Heart Rate) using ergocycle for a total of 40 minutes. Capiler blood glucose levels were taken before and after physical exercise.

Results: The mean decrease in blood glucose levels in the morning group was $-8,353 \pm 9.16$ mg/dL with ($p=0.002$). The mean decrease in blood glucose levels in the night group was $-6,294 \pm 10.10$ mg/dL with ($p=0.021$). The results of the comparison of changes in blood glucose levels between morning and night groups were not significant ($p = 0.538$).

Conclusion: Moderate intensity physical exercise can reduce blood glucose levels in the morning and night groups acutely. There was no significant difference between changes in blood glucose levels before and after moderate intensity physical exercise between morning and night time.

Keywords: physical activity, exercise, diabetes mellitus, obesity, circadian rhythms, morning, night, moderate intensity physical exercise, acute