Effect of specific aerobic training on glycemic control, body mass index and selected physiological parameters among type ii diabetes patients attending ayder comprehensive specialized hospital, Mekelle city, Ethiopia

Kalayou Kidanu

Mekelle University, College of Health Sciences, School of Nursing, Ethiopia

Introduction: Type II diabetes mellitus is a chronic metabolic disorder characterized by hyperglycemia and impaired insulin action and/or insulin secretion. Physical exercise is associated with decreased risk of morbidity and mortality in people with diabetes. However, recent studies suggest that the effect of physical exercise on glycemic control, Body Mass Index and physiologic parameter remain often under investigated and therefore not appropriately addressed among people with diabetes.

Objective: To evaluate the effect of specific aerobic training on glycemic control, BMI and designated physiological parameters among type2 diabetes patient attending Ayder comprehensive specialized hospital Mekelle. Hypoglycemia divests the brain of the continuous supply of glucose required for energy. Low blood glucose levels are identified by the ventromedial hypothalamus. In turn, hormonal cascade is activated to quickly restore euglycemia that initiates with inhibition of insulin secretion. The release of glucagon and epinephrine raises endogenous glucose production by increased hepatic gluconeogenesis and glycogenolysis also renal gluconeogenesis. Cortisol and growth hormone are slow-acting changes to long hypoglycemia. It may promote oxidative stress and neuronal cell death, mostly as a significance of neuronal NADPH oxidase activation and extracellular zinc release during glucose reperfusion. Heightened glucose absorptions during reperfusion can lead to cell death. The responses also encourage the sympathetic autonomic nervous system, resulting in symptoms of hunger, trembling, sweating, , anxiety, and nervousness. Lack of glucose activates neuroglycopenic symptoms, including irritability and confusion. Sserious hypoglycemic frequently occur during sleep, the intensity and recognizability of counter regulatory responses tend to be weakened, depriving individuals of the adequate stimulus to counteract hypoglycemia. Nocturnal hypoglycemia (NH), may result in part from insufficient food intake or untimely insulin dosage the previous evening. Asymptomatic NH is a common phenomenon affecting almost 50% of adults & 78% of children and lasting several hours. NH is supposed to contribute to the "dead-in-bed syndrome" that leads to the mortality upto 6% of type 1 diabetic individuals below the age of 40 years. Hypoglycemia-related autonomic failure also results from extreme physical activity. Exercise-induced hypoglycemia happens up to 17 h after end of physical activity and can effect from more glucose utilization and insulin sensitivity. The counterregulatory responses may be reduced by 50% during hypoglycemia by moderate exercise.

Methods: A total of 20 male type II diabetes patients were selected as subjects. All participants of the study were there age ranges between 35 to 45 years. The subjects those fulfilled the inclusion and exclusion criteria were selected and randomly divided in to two groups of ten (n=10) in each groups. Group I intervention group (n=10) in which 12 weeks specific aerobic training were given and group II control group (n=10) did not received any special training. Hemoglobin A1C for Glycemic control, Weight/(Height)2 for Body Mass Index, counting at radial arteries for resting heart rate, counting number of inspiration for respiratory rate, Queens college step test for maximum oxygen consumption (VO2max), and Nose clip for breath holding time test type or tool were used for this study to check the effect of the training. The data were analyzed using descriptive statistical SPSS version 20 software. Paired "t" test were used to compere pre and posttest result of within experimental and control groups and independent "t" test were used to compere pre and posttest between experiment and control groups with assured interval at the important level of 0.05. Results were elaborated with tests, tables and figures in relation to the variables.

Result: Important improvement in Glycemic control, BMI and designated physiological parameters was observed in intervention group. Statistically substantial change in terms of decrease in Hemoglobin A1C, BMI, resting heart rate, respiratory rate, and increase in VO2max, and Breath holding time were seen in experiment group individuals whereas as the control groups no change was seen. Generally, the results obtained through this study proved independent "t" test comparison between experiment and control groups were shown positive effect on experimental group. After 12 week specific aerobic training experimental group presented better improvements on Glycemic control, BMI, and selected physiological parameters compare with control group at 0.05 levels confident