EFFECT OF PERCUTANEOUS ELECTRICAL MUSCLE STIMULATION ON FASTING GLUCOSE LEVEL IN A PATIENT WITH BOTH TYPE 2 DIABETES AND SCHIZOPHRENIA

M. Fujibayashi, I. Kishida, C. Ishii, S. Endo, N. Ishii, T. Moritani

It has been estimated that 40-60% of patients with schizophrenia are overweight or obese due to a combination of illness-related factors and use of antipsychotic medications. Lifestyle modifications are crucial to reduce risk factors for overweight or obesity in the general population as well as among patients with schizophrenia who are at even higher risks. Recently, percutaneous low-frequency electrical muscle stimulation (EMS) has attracted extensive attention, as it effectively enhances energy expenditure without limb movements. In addition, it was reported that the enhancement of glucose uptake by EMS is much greater than that by voluntary pedaling exercise in healthy subjects. These results strongly suggest that EMS is an effective method to enhance glucose metabolism. Therefore, the present study is designed to investigate glucose metabolism by means of percutaneous EMS in patients with both type 2 diabetes and schizophrenia. The percutaneous EMS training was performed 4 days per week for a period of 4 weeks. We used a specially designed muscle stimulator powered by a 15-V battery for EMS training in this investigation. The duty cycle was a 5 s stimulation with a 2 s pause for a period of 20 min. The patient was examined before and after the EMS intervention. We measured anthropometric parameters and biochemical blood profiles for glucose metabolism. The EMS intervention resulted in reduction of body mass (58.9 vs. 58.4kg) and fasting glucose level (113 vs. 90mg/dl). Type 2 diabetes is associated with cardiovascular diseases and multiple health risks. The present results provide first evidence indicating that EMS is a new exercise method for treating glucose metabolism in patients with both type 2 diabetes and schizophrenia, especially who cannot perform adequate voluntary exercise because of excessive obesity or severe diabetic complications.