

Official Title: The effects of spasticity on glucose metabolism and soft tissue body composition in individuals with motor complete and motor incomplete spinal cord injury

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Study Protocol:

Objective: Investigators aimed to assess the effects of spasticity on glucose metabolism and body composition in individuals with motor complete and incomplete SCI.

Methods: This prospective, cross-sectional study was conducted at the inpatient rehabilitation unit of a training and research hospital from September 2014 to May 2018. Participants with SCI were included to study if times from injury were at least one year. Participants had an AIS grades of A-D with spasticity. Spasticity was assessed with Penn Spasm Frequency Scale (PSFS) and Modified Ashworth Scale (MAS). Hip adductor and extensor spasticity, knee extensor and flexor spasticity and ankle plantar flexor spasticity were assessed by using MAS. Body composition was measured by dual-energy x-ray absorptiometry. All participants underwent a 75 gram (g) oral glucose tolerance test (OGTT). Insulin sensitivity and insulin resistance were assessed by calculating Matsuda index and HOMA-IR. Investigators assessed the effects of spasticity on glucose metabolism and body composition in participants with SCI.

Statistical analysis

The IBM SPSS Statistics 22 (IBM SPSS, Turkey) program was used for the statistical analysis. Normal distribution was evaluated using the Shapiro-Wilk test. Descriptive statistics of mean, SD, and frequencies were calculated. Pearson correlation analysis was used to assess the association between the parameters with conformity to the normal distribution. Statistical significance was evaluated at $p < 0.05$.

Results: With regard to the ASIA impairment scale 14 patients were classified as grade A and B (motor complete injured) and the remaining 19 were classified as grade C and D (motor incomplete injured). There was a positive correlation between hip adductor spasticity and trunk, android and gynoid percent fat-free masses (FFM%), and between hip extensor spasticity and android FFM% in

patients with motor complete SCI. There was a negative correlation between hip extensor and knee flexor spasticity and HOMA index; and positive correlation between hip adductor and extensor, knee flexor and extensor spasticity and Matsuda index in these patients. There was a positive correlation between knee extensor spasticity and gynoid FFM% and also, between PSFS and arms, trunk, gynoid, and total FFM% in patients with motor incomplete SCI. There was a negative correlation between hip adductor and extensor spasticity, PSFS and level of fasting glucose in patients with motor incomplete SCI.