

Prize Poster 1

The association between specific somatosensory loss and deterioration of balance in individuals with diabetes mellitus

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Background and aims: Some but not all studies have shown the impact of reduced somatosensation of the lower limbs on standing balance in individuals with diabetes mellitus. The aim of this study was to assess posture stability using computerised dynamic posturography in type 1 and type 2 diabetes mellitus patients with neuropathy and to identify the association between specific somatosensory loss and deterioration of balance. **Materials and methods:** The 85 (age between 22 and 69 years) type 1 and type 2 diabetes mellitus patients with peripheral neuropathy participated. The postural stability was evaluated using sensory organisation test (SOT), motor control test (MCT) of computerised dynamic posturography (CDP). Neurological disability score (NDS) and neuropathy impairment score of the lower limbs (NIS-LL) were used to determinate specific somatosensory loss. Trail making test was used to assess the role of frontal dysfunction in posture stability. **Results:** Patients were divided into 3 groups: 1) without reduction of proprioception (passive joint position sense), vibration or tactile sensation; 2) with reduction of vibration or tactile sensation, but without reduction of proprioception; 3) with reduction of proprioception, vibration and tactile sensation. Equilibrium scores in sensory organisation test (SOT) 1, 2, 3 conditions and the composite muscle response latencies in MCT were significantly worse ($p \leq 0,03$) in the group 3 as compared to the group 1. There were not differences between groups in presence of vestibular syndrome. Then patients were divided into 2 groups: 1) without vestibular syndrome; 2) with vestibular syndrome. The equilibrium scores in all SOT conditions were significantly worse ($p < 0,01$) in the group 2, but there were not differences in muscle response latencies between groups. There were not significant correlations between equilibrium scores and trail making test parameters. **Conclusion:** Peripheral neuropathy with large fiber dysfunction and vestibular syndrome are independent risk factors of postural instability in diabetic patients. The large fiber dysfunction with the reduction of passive joint position sense leads to instability in environments of low lighting, visual movement and in case of unexpected external disturbances. Vestibular syndrome in diabetic patients in addition leads to instability in case of surface changes/irregularities.