

Postural Characteristics of Diabetic Neuropathy

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Objective

To explore the posturographic correlates of diabetic neuropathy by comparing the performances of three groups of diabetic patients (severe, moderate, and absent neuropathy) with those of normal subjects and four clinical control groups.

Research Design and Methods

Using the Interactive Balance system (Tetrax, Ramat Gan, Israel), based on the assessment of vertical pressure fluctuations on four independent platforms, one for each heel and toe part, respectively, posturographic examinations were given to 28 diabetic patients (8 with severe, 12 with moderate and 8 with no peripheral neuropathy), 30 normal subjects, and a clinical control group of 52 patients (14 with stage II Parkinson's disease, 13 with brain damage, 7 with whiplash and 19 with peripheral vestibular pathology). The following posturographic parameters were evaluated: 1) general stability; 2) Fourier analysis showing patterns of sway intensity within eight frequency bands between 0.1 and 3 Hz; 3) weight distribution; 4) synchronization of sway; and 5) performance patterns for eight positions, requiring closure of eyes and standing on an elastic surface, as well as left, right, back and downward head turns.

Results

For positions with closed eyes, diabetic patients with severe and moderate neuropathy were significantly less stable than normal subjects and diabetic patients without neuropathy, but diabetic patients with severe and moderate neuropathy turned out to be as equally unstable as clinical control subjects. However, for sway intensity within the band of 0.5 to 1.00 Hz on positions with lateral head turn with occluded vision, neuropathic diabetic patients performed significantly worse than did both normal and clinical control subjects. The same posturographic parameter also differed significantly between normal subjects and diabetic subjects without neuropathy.

Conclusions

As reported in previous studies, general instability in diabetic neuropathy is not a sufficiently characteristic correlate of the syndrome. On the other hand, spectral analysis of sway in stressful positions involving head turning appears to differentiate diabetic neuropathy from other disorders involving postural disturbances.

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