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SACRAL EVOKED POTENTIALS IN DIABETIC PATIENTS WITH LOWER URINARY TRACT DYSFUNCTION

Aims of Study

Diabetes mellitus has a harmful effect on the peripheral nervous system and the central, as well as the somatic and the autonomous nervous system.^{1,2} Diabetic cystopathy is a consequence of diabetic neuropathy³. The aim of the study is to reveal nervous system lesions in patients with diabetes mellitus and lower urinary tract symptoms and/or signs.

Methods

Twenty-six diabetic patients (mean duration of diabetes 15.7 years) were distributed in two groups in respect of the lower urinary tract symptoms (LUTS) and signs suggestive of lower urinary tract dysfunction (LUTD) according to ICS standardization⁴. Group A : with LUTS and/or LUTD (at least two symptoms out of a catalog of 10 LUTS and/or abnormal findings in the frequency volume charts. Group B : without LUTS or LUTD. They all had normal renal function and no history of serious lumbar pain with possible root damage that could interfere with electrophysiological tests.

Group A : 14 patients (7 women and 7 men), mean age 56 years old. Group B : 12 patients (4 women and 8 men), mean age 49.5 years old.

The study took place in two phases:

1st: History, Clinical examination and clinical study of five cardiovascular reflexes⁵.

2nd: Electrophysiological tests^{6,7}:

- motor conduction velocity of right peroneal nerve and left tibial nerve
- sensory conduction velocity of left sural nerve
- sympathetic skin response

Roots and neurotomes, which are more or less in close relation with detrusor's and sphincter's mechanism innervation, were studied with sacral evoked potentials:

- electromyography of bulbocavernosus muscles
- bulbocavernosus reflex
- somatosensory evoked potentials (SSEP) of left tibial nerve (P40)
- SSEP of pudendal nerves (P40)
- transcranial magnetic stimulation - central motor time of bulbocavernosus muscles.

The Fischer's exact test was used for statistical analysis.

Results

The rate of findings suggesting of peripheral polyneuropathy were similar in both groups (A: 57.14% and B: 50%). Abnormal findings of autonomous nervous system tests were similar in both groups (A: 78.5% and B: 66.66%). Abnormal autonomous nervous system tests combined with peripheral neuropathy present some difference between the two groups which however does not reach statistical significance.

The latency of P40 of SSEP of left tibial nerve was delayed in group A and the difference between the two groups was statistically significant (p:0.01). On the contrary delayed latency of P40 of SSEP of pudendal nerves was not statistically significant (p: 0.79). Power statistical analysis showed that bulbocavernosus reflex was more often abnormal in group A than in B. Delayed conduction time in the central nervous system was found in 6 patients out of 26 (23.07%). Using power statistical analysis, conduction time in the central nervous system was found to be reduced more often in group A than in B.

Conclusions

Sacral evoked potentials (bulbocarvenosus reflex, SSEP of left tibial nerve, SSEP of pudental nerves, motor evoked potentials of bulbocarvenosus muscles after transcranial magnetic stimulation) are of great importance in the diagnosis of diabetic neuropathy and cystopathy and in revealing abnormal conduction time in the central nervous system pathways. It should be noted however that there is considerable difference between the various types of sacral evoked potentials as to their efficiency in the diagnosis of diabetic patients with urinary dysfunction.

References:

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