

NEUROPHYSIOPATHOLOGICAL STUDY OF THE PELVIC FLOOR IN PATIENTS WITH INTERSTITIAL CYSTITIS

Hypothesis / aims of study

The main clinical aspects in patients affected by interstitial cystitis (IC) are painful symptoms, referred not only to the lower urinary tract but also to other pelvic organs and perineal area. Most patients exhibit a characteristic aspect regarding the muscular pelvic floor pain and the association of this condition with myofascial pain and pelvic dysfunction has already been defined (1). The aim of the present research was to consider the available neurophysiological testing of the clinical practice i.e. sphincter EMG, pudendal nerve terminal motor latency (PNTML), evoked sacral potential (ESP) and their bioelectrical parameters applied to pelvic floor musculature in a group of subjects with IC.

Study design, materials and methods

Twenty-three patients were studied (17 women – 6 men), mean age 51 yrs (20-78 yrs) who came to the Laboratory of Urodynamics and Neuro-Urology of the City Hospital between January 2003 and September 2004. The mean lasting of symptoms to the diagnosis completed was 7 yrs (1-33 yrs) and all patients showed a history of chronic pelvic pain and painful bladder syndrome. During clinical and instrumental evaluation, aiming to assess the anatomo-functionality of the lower urinary tract, were performed PNTML by means of St.Mark's pudendal electrode (through intrarectal or intravaginal stimulation), anal sphincter EMG by means of surface electrodes (under resting condition, voluntary contraction and reflex contraction under coughing), ESP (analysis of sacral reflex through surface stimulation of the dorsal nerve of the penis or of the clitoris and recording at anal level). According to the data reported by other Authors (2), it was considered as reference the value of pudendal nerve time motor latency = 2.0 +/- 0.2 msec and the mean value of the sacral reflex latency was considered corresponding to 32.7 +/- 3.8 msec.

Results

The mean time of latency for the right pudendal nerve was 1.60 msec, while for the left one was 1.83 msec. In 5 patients (21%), the signal was recorded only on one side (3 only on the left, 2 only on the right side) and 2 subjects (8.6%) showed an increase of latency to over 2 msec. The mean amplitude of potential was 0.40 mV (right pudendal nerve) and 0.43 mV (left pudendal nerve). The mean value of PNTML differed from 0.209 msec for the right nerve and from 0.17 for the left one, referring to the considered parameters; while slight differences were found in the measurement of the reciprocal amplitudes. The mean latency of the sacral reflex was 31.32 msec and in 26.3% (6 subjects) this parameter was found larger than 33 msec, considered pathological if compared to the reference intervals above described. The potential of motor unit measured on anal sphincter EMG was 1.81 msec (resting), 2.65 msec under reflex contraction (coughing) and 2.81 msec under voluntary contraction (mean values). Under these two last conditions, the potentials of motor unit were larger, faster and longer lasting if compared to the basal resting conditions, sometimes showing interference signals. The sacral reflex seemed less involved (only one patient showed signs of pelvic denervation) and the major increase of latency correlated with the lasting of the symptoms (chronic pelvic pain > 10 yrs) and a dysfunctionally voiding pattern. The asymmetry of both pudendal nerve function, in term of time of latency, was more evident in the group of studied patients.

Interpretation of results and concluding message

Our data showed, at pelvic level, the involvement of the peripheral nervous system, even if with minor alterations of the functionality of the nervous structures. The main dysfunctions were evident in the pelvic floor muscle (pubo-coccygeal myalgia, sphincteric overactivity) which would lead to an inhibitory mechanism in the lower urinary tract (detrusor hypocontractility) since this one and the pelvic floor have the same nervous circuit at the sacral level in the spinal cord (S₂-S₄). It is well known, however, that the pelvic floor musculature dysfunction can induce bladder abnormalities through the afferent pathway and

C-fibers in particular (so-called neurogenic cystitis) producing pain as a symptom. Patients with IC must be evaluated also under the neurological profile, at least at the diagnosis time, in order to define all pathological aspects of clinical picture: Besides, the role of the peripheral nervous system in maintaining pain as a symptom must be considered in a therapeutic program of these subjects.

References

- 1) Interstitial cystitis – Philadelphia-New York, Lippincot-Raven Ed., 1997.
- 2) Motor nerve conduction studies: measurement principle and interpretation of findings. J.Clin.Neurophysiology 1995, 12 (3): 254-279.