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BLADDER SENSATION AND NEUROLOGIC DISEASES

Hypothesis / aims of study

Neurologic diseases cause various types of sensory disorder in the bladder, with or without that in the limbs. A typical such disease is diabetic neuropathy, where bladder sensation is lost. In contrast, diabetic neuropathy patients who lack detrusor overactivity may have increased bladder sensation [1]. However, it is not clear which neurologic diseases might cause reduced bladder sensation or increased bladder sensation. In order to answer this question, we aimed to analyse bladder sensation and neurologic diseases.

Study design, materials and methods

We retrospectively analyzed neuro-urologic diseases cases in our laboratory. 2300 case records accumulated in the past 6 years were digitized using File Maker Pro personal computer database software. Data registries included a diagnosis, a lower urinary tract symptom (LUTS) questionnaire from a urodynamic study and neurological examinations. Most patients were referred for assessment of lower urinary tract (LUT) function (resulting from LUTS) by our university hospital's departments of neurology, urology, orthopedic surgery or endocrine/metabolic diseases.

Results

A) Neurologic diseases that caused reduced bladder sensation (bladder volume at the first sensation > 300 ml) included 1) peripheral nervous system (PNS) diseases, e.g., diabetics, amyloidosis, pure autonomic failure, vasculitic neuropathy, pelvic nerve injury due to uterus carcinoma or ovarian cyst surgery, lumbar spondylosis, and Guillain-Barre syndrome. In this category peripheral afferent fibers are commonly involved; some cases had pure small fiber neuropathies; bladder sensation more severely affected in diseases affecting distal fibers. 2) central nervous system (CNS) diseases, e.g., multiple system atrophy, spinocerebellar ataxia type 3, multiple sclerosis, syringomyelia, cervical spondylosis, familial spastic paraparesis, and ossification of the posterior longitudinal ligament. In this category spinal afferent fibers are commonly involved.

B) Neurologic diseases that caused increased bladder sensation (bladder volume at the first sensation < 100 ml but without detrusor overactivity) included 1) PNS diseases and 2) CNS diseases, most of which strikingly overlapped neurologic diseases that caused reduced bladder sensation. In addition, CNS diseases in this category included basal ganglia diseases (Parkinson's disease etc.), and psychogenic disorders (depression etc.).

Interpretation of results

Lesions in the peripheral/spinal afferents cause reduction and increase in bladder sensation, the latter presumably resulting from irritation and ephaptic transmission due to partial injury. The basal ganglia is reported to have a role on sensory gating of afferents, particularly proprioception, and those from the urinary bladder [2]. Reports of psychogenic disorders showed decreased GABA, 5HT, and increased CRF within the CNS, which may well alter sensory function, including afferents from the urinary bladder [3]. In the present study we could not include thalamic or frontal lobe lesions; therefore contribution of these brain area to altered bladder sensation remains uncertain.

Concluding message

Lesions in the peripheral and spinal afferents cause reduction and increase in bladder sensation. Basal ganglia and psychogenic disorders cause increased bladder sensation. Not only detrusor overactivity, but also altered bladder sensation of neurogenic origin becomes a major treatment target in order to maximize the quality of life in the patients.

References

1. Neurorol Urodyn 2007; 26: 807-813
2. Brain. 2008; 131(Pt 1): 132-145
3. Neurorol Urodyn. 2007; 26: 518-524

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Was informed consent obtained from the patients?	Yes