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QUESTIONNAIRE-BASED ASSESSMENTS OF THE DIFFERENCES IN THE URINARY SYMPTOMS IN MULTIPLE SCLEROSIS AND NEUROMYELITIS OPTICA

Hypothesis / aims of study

It is well-known that bladder dysfunction is common in patients with multiple sclerosis (MS) and is mainly caused by spinal cord lesions [1]. Recently, the discovery of a highly specific autoantibody (Aquaporin 4-IgG) has been identified is pathognomonic of neuromyelitis optica (NMO), which is characterized by severe episodes of optic nerve and spinal cord dysfunction [2]. Because the spinal lesions of NMO are usually more severe (spinal cord lesions involving >3 vertebral segments) than those of MS, urinary symptoms in patients with NMO may also be more severe as compared with MS. However, the difference in the urinary symptoms between MS and NMO remain unknown. We therefore planned to elucidate the differences between the two conditions using a urinary symptoms questionnaire.

Study design, materials and methods

We recruited 34 patients with MS (mean age 43 ± 10 years; 7 men and 27 women) and 14 patients with NMO (mean age 49 ± 13 years; 2 men and 12 women), who were examined at our neurology clinic. We administered the urinary symptom questionnaires (a) overactive bladder symptom score (OABSS) and (b) International Prostate Symptom Score (IPSS) to patients with MS and NMO who were in the remission phase. Neurological disability was evaluated using Expanded Disability Status Scale (EDSS). Neuroradiological examinations were performed by magnetic resonance imaging of the brain and spinal cord.

Results

The mean score of OABSS was 2.7 ± 2.5 and 3.4 ± 2.7 in patients with MS and those with NMO, respectively. The mean score of IPSS was 5.4 ± 4.7 and 8.8 ± 7.8 in patients with MS and those with NMO, respectively. The scores did not show a statistically significant difference between in patients with MS and those with NMO. In contrast, the score of IPSS quality of life was 2.2 ± 1.5 in MS patients and 3.6 ± 1.5 in NMO patients, and the difference was statistically significant. In addition, the mean score of EDSS was 2.8 ± 2.2 in MS patients and 4.8 ± 1.7 in NMO patients, and the difference was statistically significant. A positive correlation was found between EDSS and IPSS scores in patients with MS ($r = 0.44$, $p < 0.01$) (Figure 1 a), whereas a negative correlation was found between EDSS and IPSS scores in patients with NMO ($r = -0.53$, $p < 0.04$) (Figure 1 b). Multiple linear regression analysis showed that the presence of a cervical spinal cord lesion ($\beta = 3.73$, $p = 0.01$, adjusted $R^2 = 0.20$) was associated with the severity of urinary symptoms in patients with MS and NMO.

Interpretation of results

The present study revealed that the mean scores of IPSS and OABSS was higher in patients with NMO than in those with MS; these findings were not statistically significant. However, the IPSS QOL was significantly lower in patients with NMO than in those with MS, indicating that even slightly more severe urinary symptoms may result in a significant QOL decrease.

In contrast, EDSS scores were significantly larger in patients with NMO than in those with MS, suggesting that neurological disability was more severe in patients with NMO. It should be noted that the correlation between EDSS and IPSS scores in MS patients was the opposite of the correlation in patients with NMO. In patients with MS, EDSS and IPSS scores showed a positive correlation indicating that the degree of urinary dysfunction was parallel to the neurological disability, which appeared to be feasible. However, EDSS and IPSS scores showed a negative correlation in patients with NMO, which was more difficult to understand.

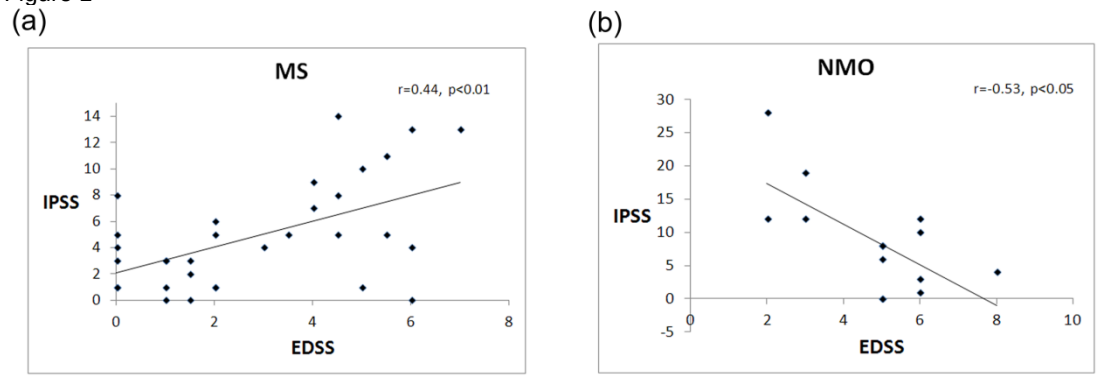
We reviewed the medical records of patients who had either high IPSS score (>10) and low EDSS score (<3) or low IPSS score (<7) and high EDSS score (>3), respectively. Four patients with NMO had high IPSS and low EDSS scores and the other four patients had low IPSS and high EDSS scores, respectively. In the high-IPSS and low-EDSS group, two patients probably had severe neurological disabilities at the time of relapse; this was followed by significant improvement of their neurological disabilities except for the urinary dysfunction after treatment with steroids. One patient was also diagnosed with benign prostatic hyperplasia, which might have also contributed to a high IPSS score. In the low IPSS and high EDSS group, three patients had optic nerve lesions as that were severe relative to other neurological disabilities, which contributed to their high EDSS score. One patient had lost urinary sensation and therefore did not complain of any urinary symptoms. These heterogeneous combinations of clinical symptoms and clinical course might contribute to the negative correlation between IPSS and EDSS scores in patients with NMO.

In addition, the present study revealed that cervical spinal cord lesions were significantly responsible for the urinary symptoms as assessed by IPSS in patients with MS and those with NMO. This result seems to be plausible because both the ascending and descending micturitional pathways, which are important in regulating storage and voiding function, pass through the cervical spinal cord. Cervical spinal cord lesions might disrupt the micturional pathway, leading to severe urinary dysfunction.

Concluding message

The urinary symptoms tended to be more severe in patients with NMO as compared with patients with MS. The correlation between EDSS and IPSS scores in MS patients was the opposite of the correlation in patients with NMO. Cervical spinal cord lesions are responsible for the urinary symptoms in patients with MS and NMO.

Figure 1



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Disclosures

Funding: none **Clinical Trial:** No **Subjects:** HUMAN **Ethics Committee:** Chiba University ethical committee **Helsinki:** Yes **Informed Consent:** Yes