Table 2 Overall and by sex characteristics of respondents with LBP as the primary pain

Characteristic	Overall, *n* (%; *n* = 2696)	Men, *n* (%; *n* = 1424)	Women, *n* (%; *n* = 1272)
Age group (years)			
20–29	196 (7.3)	80 (5.6)	116 (9.1)
30–39	476 (17.7)	229 (16.1)	247 (19.4)
40–49	597 (22.1)	298 (20.9)	299 (23.5)
50–59	596 (22.1)	287 (20.2)	309 (24.3)
60–69	537 (19.9)	295 (20.7)	242 (19.0)
70–79	294 (10.9)	235 (16.5)	59 (4.6)
Mean ± SD	50.2 ± 13.8	52.4 ± 14.3	47.8 ± 12.9
Occupational status			
Worker	1,459 (54.1)	916 (64.3)	543 (42.7)
Housework and/or retired	1,013 (37.6)	395 (27.7)	618 (48.6)
Other (including student)	224 (8.3)	113 (7.9)	111 (8.7)
Duration of LBP			
Acute (<3 months)	526 (19.5)	281 (19.7)	245 (19.3)
Chronic (>3 months)	2,106 (78.1)	1,123 (78.9)	983 (77.3)
Unknown/refused to answer	64 (2.4)	20 (1.4)	44 (3.5)
Disability			
Grade 1[a]	1491 (55.3)	808 (56.7)	683 (53.7)
Grade 2[b]	876 (32.5)	445 (31.3)	431 (33.9)
Grade 3[c]	329 (12.2)	171 (12.0)	158 (12.4)
NRS score (mean ± SE)	5.0 ± 0.0	4.8 ± 0.1	5.2 ± 0.1
Number of pain sites other than LBP (mean ± SE)	1.8 ± 0.0	1.6 ± 0.0	2.1 ± 0.1
EQ5D score (mean ± SE)	0.776 ± 0.003[d]	0.779 ± 0.004	0.772 ± 0.004

LBP Low back pain, *NRS* numeric rating scale, *SE* standard error

[a] LBP without disability for social activity, such as work, school, and housework

[b] LBP with disability for social activity, such as work, school, and housework

[c] LBP with disability leading to absence from social activity, such as work, school, and housework

[d] EQ5D score was significantly lower than that of the total study population (unpaired *t* test, $P < 0.01$)

Table 3 Mean number of pain sites other than LBP, EQ5D score, and NRS score based on the disability of respondents with LBP as their primary pain

Disability (modified GCPS)	*n*	EQ5D score[d] (mean ± SE)	No. of pain sites other than LBP (mean ± SE)	NRS score[e] (mean ± SE)
Grade 1[a]	1,491	0.817 ± 0.003	1.5 ± 0.0	4.2 ± 0.0
Grade 2[b]	876	0.736 ± 0.004	2.3 ± 0.1	5.8 ± 0.1
Grade 3[c]	329	0.694 ± 0.009	2.3 ± 0.1	6.5 ± 0.1

GCPS Graded chronic pain scale, *LBP* low back pain, *NRS* numeric rating scale, *SE* standard error

[a] LBP without disability for social activity, such as work, school, and housework

[b] LBP with disability for social activity, such as work, school, and housework

[c] LBP with disability leading to absence from social activity, such as work, school, and housework

[d] EQ5D score showed a negative correlation with higher disability (Spearman's rank correlation coefficient, –0.371; $P < 0.01$)

[e] NRS score showed a positive correlation with higher disability (Spearman's rank correlation coefficient, 0.418; $P < 0.01$)

from social activity and number of pain sites ≥ 7 had a strong relationship with low HRQoL. Similar trends were observed in both men and women; however, the impacts of absence from social activity and number of pain sites ≥ 7 were stronger in women than in men.

Discussion

In the present study, the 1-month prevalence of LBP was 25.2 % (5060 respondents), which is similar to that reported by Suzukamo and colleagues [15], who noted

Table 4 Mean EQ5D score based on age, sex, and disability of respondents with LBP as the primary pain

Disability		Total (Grades 1 + 2 + 3)			Grade 1[a]			Grade 2[b]			Grade 3[c]		
Sex	Age (years)	*n*	Mean	SE	*n*	Mean	q	*n*	Mean	SE	*n*	Mean	SE
All	20–29	196	0.797	0.009	110	0.822	0.011	69	0.774	0.015	17	0.732	0.043
	30–39	476	0.785	0.006	236	0.828	0.008	173	0.756	0.009	67	0.706	0.021
	40–49	597	0.789	0.005	311	0.830	0.007	213	0.757	0.009	73	0.712	0.017
	50–59	596	0.777	0.006	360	0.817	0.006	172	0.727	0.010	64	0.686	0.021
	60–69	537	0.770	0.006	320	0.814	0.007	155	0.714	0.010	62	0.683	0.021
	70–79	294	0.729	0.008	154	0.782	0.009	94	0.676	0.010	46	0.659	0.026
	Total	2,696	0.776	0.003	1,491	0.817	0.003	876	0.736	0.004	329	0.694	0.009
Male	20–29	80	0.812	0.015	51	0.822	0.017	24	0.781	0.031	5	0.850	0.062
	30–39	229	0.794	0.009	114	0.837	0.011	80	0.772	0.013	35	0.702	0.033
	40–49	298	0.796	0.008	159	0.828	0.009	109	0.757	0.013	30	0.764	0.027
	50–59	287	0.781	0.008	172	0.820	0.009	81	0.725	0.014	34	0.718	0.024
	60–69	295	0.778	0.008	180	0.817	0.009	80	0.722	0.013	35	0.701	0.022
	70–79	235	0.734	0.008	132	0.781	0.009	71	0.666	0.011	32	0.689	0.034
	Total	1,424	0.779	0.004	808	0.817	0.004	445	0.734	0.006	171	0.718	0.013
Female	20–29	116	0.787	0.012	59	0.822	0.015	45	0.770	0.017	12	0.682	0.050
	30–39	247	0.777	0.008	122	0.820	0.011	93	0.743	0.012	32	0.710	0.024
	40–49	299	0.783	0.008	152	0.832	0.010	104	0.756	0.011	43	0.676	0.021
	50–59	309	0.773	0.008	188	0.814	0.008	91	0.730	0.014	30	0.650	0.034
	60–69	242	0.760	0.010	140	0.809	0.011	75	0.706	0.015	27	0.659	0.040
	70–79	59	0.708	0.020	22	0.787	0.034	23	0.704	0.020	14	0.590	0.035
	Total	1272	0.772	0.004	683	0.818	0.005	431	0.738	0.006	158	0.668	0.013

LBP Low back pain, *SE* standard error

[a] LBP without disability for social activity, such as work, school, and housework

[b] LBP with disability for social activity, such as work, school, and housework

[c] LBP with disability leading to absence from social activity, such as work, school, and housework

Table 5 Proportion of LBP with disability, and mean EQ5D and NRS scores based on number of pain sites other than LBP in respondents with LBP as the primary pain

Number of pain sites other than LBP	*n*	EQ5D score[a] (mean ± SE)	LBP with working disability[b] (%)	NRS score[c] (mean ± SE)
0	706	0.813 ± 0.005	35.7	4.1 ± 0.1
1–3	1,582	0.776 ± 0.003	44.0	5.1 ± 0.1
4–6	325	0.729 ± 0.007	59.7	6.1 ± 0.1
≥7	83	0.644 ± 0.014	75.9	7.1 ± 0.2
Total	2,696	0.776 ± 0.002	44.7	5.0 ± 0.0

LBP Low back pain, *NRS* numeric rating scale, *SE* standard error

[a] EQ5D score showed a negative correlation with the number of pain sites other than LBP (Spearman's rank correlation coefficient, −0.256; $P < 0.01$)

[b] Proportion of those with working disability (modified graded chronic pain scale grade 2 or 3 disability) showed a positive correlation with the number of pain sites other than LBP (Spearman's rank correlation coefficient, 0.184; $P < 0.01$)

[c] NRS score showed a positive correlation with the number of pain sites other than LBP (Spearman's rank correlation coefficient, 0.359; $P < 0.01$)

30.6 % as the 1-month prevalence in Japan. Interestingly, of the 5060 respondents, only approximately half (2696 respondents; 13.5 % of all respondents) reported LBP as their primary pain, with the majority reporting chronicity. Recently, LBP has been recognized as a part of widespread musculoskeletal pain. Natvig and colleagues [10] reported that only 25 % of 893 participants who reported LBP during the previous week had localized LBP. In our study, the number of those with LBP as a part of multisite pain was about 6.2 times larger than the number of those with

Table 6 Logistic regression analysis (dependent variable = lowest 20 % of EQ5D scores in total study population)

Variable	Total[a]				Male[b]				Female[b]			
	Adjusted odds	95 % CI		*P* value	Adjusted odds	95 % CI		*P* value	Adjusted odds	95 % CI		*P* value
		Lower	Upper			Lower	Upper			Lower	Upper	
Modified GCPS												
Grade 1	1.000				1.000				1.000			
Grade 2	2.930	2.393	3.589	<0.001	3.151	2.377	4.177	<0.001	2.750	2.052	3.686	<0.001
Grade 3	4.580	3.488	6.013	0.001	3.789	2.603	5.517	<0.001	5.642	3.780	8.420	<0.001
No. of pain sites other than LBP												
0	1.000				1.000				1.000			
1–3	1.420	1.128	1.786	0.003	1.173	0.873	1.576	0.290	1.850	1.275	2.685	0.001
4–6	2.367	1.733	3.232	<0.001	2.146	1.365	3.375	0.001	2.856	1.816	4.492	<0.001
≥7	6.124	3.541	10.589	<0.001	4.579	2.010	10.432	<0.001	8.426	3.970	17.882	<0.001
Sex												
F/M	1.044	0.868	1.256	0.644								
Age (years)												
<60	1.000				1.000					1.000		
≥60	1.545	1.271	1.879	<0.001	1.598	1.234	2.068	<0.001	1.485	1.097	2.011	0.010
NRS score												
<7	1.000				1.000					1.000		
≥7	1.883	1.541	2.300	<0.001	2.129	1.608	2.820	<0.001	1.650	1.238	2.200	0.001

CI Confidence interval, *F* female, *GCPS* graded chronic pain scale, *LBP* low back pain, *M* male, *NRS* numeric rating scale

[a] Multivariate analysis adjusted by modified GCPS, number of pain sites other than LBP, sex, age, and NRS score

[b] Multivariate analysis adjusted by modified GCPS, number of pain sites other than LBP, age, and NRS score

localized LBP. Previous studies [9, 10] have reported that many LBP respondents have pain elsewhere, which could be the primary reason for their disability. Therefore, we focused on LBP respondents reporting LBP as their primary pain for further analyses in this study.

In the present study, the mean EQ-5D score of those with LBP as their primary pain was 0.776 (SE, 0.003), which was significantly lower than that of the total study population [0.850 (SE, 0.001); $P < 0.01$], and slightly lower than the average score of patients with stage 5 chronic kidney disease (CKD) in Japan (0.798; 95 % CI, 0.757–0.839) [16]. Since stage 5 CKD represents established kidney failure, the similar HRQoL obtained in the present study indicates that the HRQoL of those who suffer from LBP could be as low as, or even lower than, those who are candidates for hemodialysis.

Generally, lower HRQoL is reported with higher disability in LBP patients [8, 17, 18]. Kovacs and colleagues revealed a negative correlation between the Rolland Morris Disability Questionnaire and the EQ-5D in LBP [8, 18]. In the present study, we used the GCPS [12], a well validated scale for assessing LBP disability, with minor revision. The revision was made to focus on disability and absence from social activity because the impacts of these disabilities on HRQoL have not been well examined. In our study, there was a negative correlation between disability and HRQoL, as in previous studies [8, 17, 18]. The differences in the mean EQ-5D scores between those with and those without disability and absence were 0.08 and 0.04, respectively. Interestingly, the differences were similar to the minimal clinically important difference reported in previous studies (0.033–0.074) [19, 20]. Collectively, these data suggest that the presence of disability for social activity and its severity regarding absence might have a significant meaning for those who suffer from LBP. Therefore, improvement of these disabilities might represent a clinically important difference, which needs further investigation.

In our study, HRQoL decreased as the number of pain sites increased, thus showing a negative correlation, whereas the proportion of disability and pain intensity increased as the pain sites increased. Kamaleri and colleagues [9] revealed that single-site pain did not have a large impact on physical fitness, feelings, or daily and social activities, and that functional problems increased markedly, in an almost linear manner, with increase in number of pain sites. From another study, the widest variation in health-related functioning, such as the items on the short form-36, was observed by the number of pain sites, with lower function seen with increase in number of pain sites [21]. LBP patients also have lower general health, poorer function, and poorer long-term work disability when their LBP is accompanied by multisite pain [10, 22, 23]. Our findings are consistent with those of previous reports, showing a similar relationship among pain intensity, disability, HRQoL, and number of pain sites in LBP responders. The reason why the majority of those

with LBP as their primary pain also reported multisite pain could be the generalized hyperalgesia known to exist in LBP patients [24]. Compared with healthy control subjects, LBP patients exhibit significantly lower pressure pain thresholds at all sites [25, 26]. The continuous nociceptive input might initiate central sensitization [27], which could develop widespread pain in those with LBP as their primary pain [24, 27].

In multivariate analyses, after adjusting for all the variables, modified GCPS grade, number of pain sites, age ≥60 years, and pain intensity were found to be associated with low HRQoL. Among these variables, disability with absence from social activity and ≥7 pain sites showed a stronger association than pain intensity (NRS score ≥7) and age ≥60 years. A similar tendency was seen in both men and women, highlighting the importance of multisite pain and disability in those who suffer from LBP. Although our study had limitations (due to its cross-sectional design), we believe the strong relationships seen in our study are noteworthy. Based on our results, occupational management [28, 29] focusing on returning to work, and management of multisite pain might have a more significant effect on HRQoL improvement than the management of pain itself in those who suffer from LBP. Further study is necessary to evaluate the effects of such management.

The strengths of our study include the large size of the population sample used to estimate the prevalence of those with LBP as their primary pain, and the magnitude of the associations among disability, pain intensity, number of pain sites, and HRQoL without any missing data. Some results support the validity of the PACE survey. First, the mean EQ-5D score of the PACE survey was similar to that found in a well-designed general population study (0.835) [30]. Second, the ceiling effect of the EQ-5D seen in the total study population also was similar to that reported in previous studies (42.5–47.0 %) [30–32]. Third, the percentage of those with LBP was similar to that reported previously in Japan [15]. Fourth, the percentage of workers in the total study population (52.8 %) was similar to that announced by the Japanese Ministry of Internal Affairs and Communications in 2009 (56.9 %) [11].

Some limitations in our study are notable, however. First, the selection bias due to the nature of an Internet survey needs to be addressed [33]. Although the study was conducted nationwide, using one of the largest domestic Internet survey companies, the volunteers from whom our sample was drawn were overrepresentative of people living in large cities, compared with the general population. Since LBP prevalence has geographic differences, with higher rates in urban populations than rural populations [34], caution is needed when interpreting the results of this study. Second, those who participate as Internet research volunteers may differ from the general population, and even from general Internet users. These potential differences could have affected the prevalence of LBP. Third, regarding the type of questionnaire, although a previous study reported that a Web-based questionnaire had adequate reliability compared with the paper-and-pencil version, even for older rural women [35], the mode of administration could affect the nature and rate of response [36]. Fourth, because this was a cross-sectional study, inferences cannot be drawn about causality.

In an Internet-based survey conducted in the United States, more than 27 000 individuals responded with a high response rate (75.7 %). The authors used a nationally representative Web-enabled panel of households that were recruited using a combination of random-digit dialing, landline-telephone recruiting, and address-based sampling [37]. Recruited households that did not have Internet access were provided free access via WebTV. Unlike other Internet-based surveys, the Internet-enabled panel used in the study was not limited to individuals with Internet access, and the sampling methodology was designed to ensure that the demographic characteristics of the panel were similar to those of the United States population. The methods used in this United States study maintain the representativeness of the study, while utilizing the advantages of Internet-based surveys for collecting a large amount of data. Such methodologic improvement might be necessary in our future studies.

Conclusion

Only approximately half of the LBP respondents reported LBP as their primary pain; among them, HRQoL decreased with higher disability and an increase in the number of pain sites. The presence of ≥7 pain sites and disability resulting in absence from social activity were strongly associated with low HRQoL. Occupational management focusing on return to work and management of multisite pain may have a more significant effect on HRQoL improvement than the management of pain itself in individuals with LBP. Further research should focus on the effectiveness of such management in LBP respondents.

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Conflict of interest None.

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ORIGINAL ARTICLE

Validity, reliability and responsiveness of the Japanese version of the Neck Disability Index

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Abstract
Background The Neck Disability Index (NDI) is one of the most widely used questionnaires for neck pain. The purpose of this study was to validate the Japanese NDI.
Methods We performed two surveys with an 8-week interval in 130 patients with neck pain, radiculopathy and myelopathy. We asked patients to answer two versions of the Japanese NDI: the original NDI, which had been completed by a forward–backward translation procedure, and the modified NDI, which has the phrase "because of neck pain" to the phase "because of neck pain or numbness in the arm." The other parameters examined were the strength of pain and numbness, the Japanese Orthopaedic Association Cervical Myelopathy Evaluation Questionnaire, the Hospital Anxiety and Depression Scale, and Short Form 36. Attending surgeons judged the symptom severity. Patients were asked to report the patient global impression of change (PGIC) at the second survey. The internal consistency, criterion-related and discriminative validity, and reliability were evaluated.
Results The original NDI and the modified NDI were 26.9 ± 17.1 and 29.9 ± 15.5, respectively. The Cronbach α values of the original NDI and the modified NDI were 0.92 and 0.89, respectively. Both versions of the NDI had good to excellent correlative coefficients with the related domains. The modified NDI had a higher validity for numbness and mental health-related QOL. The symptom severity was significantly correlated with the modified NDI. The intraclass correlation coefficients of the two surveys of the modified and original NDI were comparable. The effect sizes of the modified and the original NDI were 0.64 and 0.55, respectively. Spearman's ρ between the change of the NDI and the PGIC was 0.47 in the original NDI and 0.59 in the modified NDI.
Conclusions We demonstrated the validity, reliability and responsiveness of the Japanese NDI. The modified NDI was more strongly correlated with numbness and mental health-related QOL.

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Introduction

Neck pain is one of the most common complaints in the general population. Patient-reported outcome measures are primary tools used to assess the patients' condition, and the Neck Disability Index (NDI) [1], a symptom-specific questionnaire modified from the Oswestry Disability Index [2] for neck pain by Vernon, has been used extensively to evaluate patients with neck pain and cervical disorders [3].

There has been no report of the Japanese version of the NDI so far. The purpose of this study was to validate the Japanese version of the Neck Disability Index (NDI).

This study was supported by the Japanese Society for Spine Surgery and Related Research, and study approval was given by the institutional review board of the Clinical Research Support Center of the University of Tokyo Hospital.

Materials and methods

Translation of the NDI into Japanese

The NDI has ten questions with numerical responses on a six-point scale (0–5). The questions cover pain, personal care, lifting, reading, headaches, concentration, work, driving, sleeping and recreation. The raw total score of the NDI is calculated by summing the scores of the questions. The NDI is usually described as a percentage of raw scores divided by the full scores of answered questions. The final % score ranges from 0 to 100, and lower scores indicate a better state of health.

We translated the English NDI into Japanese by forward translation. The Japanese NDI was then successively translated into English as a back-translation. Finally, the original NDI was completed after we received suggestions from Dr. Vernon, the original developer of the NDI. However, during the preliminary survey at the university hospital, some patients with cervical disorders left comments on the questionnaire sheet indicating that their disability resulted not from neck pain, but from numbness in the arm. Therefore, we made the modified NDI (Supplementary material) by changing the phrase "because of neck pain" to the phase "because of neck pain or numbness in the arm" in the questions. Therefore, we included a comparative study between the two versions of the NDI in this validation study. We asked patients to answer both of the NDIs and then compared the validity between the two versions. The two Japanese versions of the original and modified NDI can be seen by downloading the files in the Supplementary material.

Participants

The first survey was performed in the hospital or in the clinic at six institutions after the institutional review board had approved the study. Signed informed consent was obtained from each patient. We recruited patients who had one of the three diagnoses below: (1) neck pain without neurological symptoms (the neck pain group), (2) cervical radiculopathy or (3) cervical myelopathy. The neck pain group included patients with acute and chronic neck pain without neurological symptoms. Patients who experienced pain after traffic vehicle accidents were included. A diagnosis of cervical radiculopathy (the radiculopathy group) was made when (1) a patient suffered from pain in an upper extremity and (2) arm pain was provoked by a specific head position or with a specific exercise, or a physician found an imaging abnormality related to the arm pain. Patients with pain only around the scapula were excluded. Cervical myelopathy (the myelopathy group) was confirmed from both the neurological and magnetic resonance imaging findings. Patients with rheumatoid arthritis, cerebral palsy and other systemic diseases that might have influenced neck conditions were excluded. Patients who suffered from both radiculopathy and myelopathy (radiculomyelopathy) were also excluded.

Data collection

The questionnaire set of the first survey included questions about patient backgrounds (age, sex, height, weight, occupation, marital status, education, smoking status) and previous treatment. It also included the original and modified versions of the Japanese NDI, the 11-grade strength of pain and numbness using a drawing of the body divided into six parts (Fig. 1), the Japanese Orthopaedic Association Cervical Myelopathy Evaluation Questionnaire (JOACMEQ) [4], the Hospital Anxiety and Depression Scale (HADS) [5, 6] and the Short Form 36 (SF-36) [7, 8].

The JOACMEQ is a disease-specific scale for cervical myelopathy proposed by the Japanese Orthopaedic Association. This patient-reported outcome measure has two components. The first component has 24 questions that comprise five domains: (1) cervical function, (2) upper extremity function, (3) lower extremity function, (4) bladder function and (5) quality of life (QOL). Each domain is calculated by a weighted sum of the involved questions, ranging from 0 to 100, with higher scores indicating a better health state. The second component has three visual analog scales for pain and numbness. We adopted only the first component in this study.

The HADS is a self-reported questionnaire for anxiety and depression. The HADS has 14 questions, and its total score ranges from 0 to 21 for each scale of anxiety and depression. A higher score indicates higher stress.

The SF-36 is a generic health-related QOL measure with 36 questions. The SF-36 consists of eight domains from the weighted sum of specific questions: physical functioning

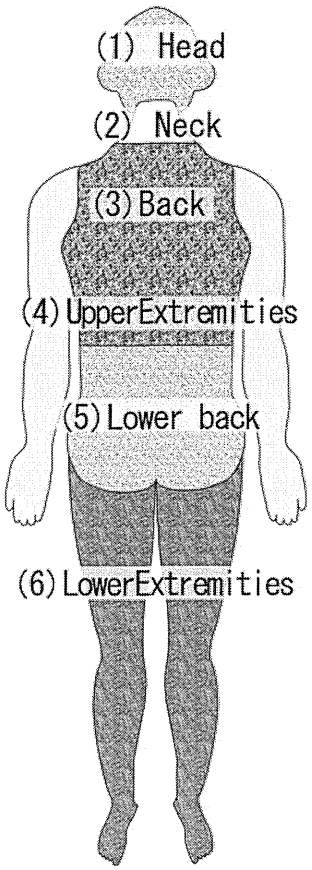

Fig. 1 The body part figure used for the question about the intensity of the pain and numbness

(PF), role physical (RP), bodily pain (BP), general health (GH), vitality (VT), social role (SF), role emotional (RE) and mental health (MH). The raw score of each domain ranges from 0 to 100, with higher scores indicating better health. Two representative scores are also calculated: the Physical Component Score (PCS) and the Mental Component Score (MCS), which are expressed in norm-based scoring. Each component score has the same mean and standard deviation (50 and 10, respectively) in a normal population.

We asked the attending surgeons to report diagnoses of the cervical disorders, symptom severity, comorbidities and treatment. The symptom severity judged by surgeons had three grades: severe, moderate and slight. The surveyed comorbidities were diabetic mellitus, shoulder disorder and peripheral nerve disorders.

The second survey for repeatability/responsiveness was performed by mail 8 weeks after the first survey. A question about the patient global impression of change (PGIC) was added in the questionnaire set. The PGIC was composed of seven answers: much better, better, slightly better, unchanged, slightly worse, worse and much worse.

Table 1 Patient characteristics ($n = 130$)

	N	*N* %	Mean	SD
Height (cm)	129		163.0	8.5
Weight (kg)	129		64.4	12.7
BMI	129		24.2	3.8
Occupation				
Full-time job	59	46.9		
Part-time job	9	7.0		
Housemaker	20	15.6		
Retired	20	15.6		
Other	19	14.8		
Marital status				
Married	95	74.2		
Single	33	25.8		
Education				
Middle-school	8	6.3		
High school	53	41.4		
Training college	16	12.5		
University	42	32.8		
Graduate-school	4	3.1		
Other	5	3.9		
Smoking				
Never	50	38.5		
History of smoking	51	39.2		
Present smoker	29	22.3		
Related comorbidities				
Worker's compensation	1	0.8		
Diabetes mellitus	7	5.4		
Other	2	1.5		

Numbers do not always add up to the total number because of missing values

SD standard deviation, *BMI* body mass index

Statistical analysis

Internal consistency, criterion-related validity and discriminative validity

The internal consistency was evaluated by the Cronbach α. In general, $\alpha \geq 0.9$ is regarded as excellent, $\alpha \geq 0.8$ as good and $\alpha \geq 0.7$ as acceptable [9]. The criterion-related validity was evaluated by calculating the correlation coefficients (Spearman's ρ) between two NDIs and other outcomes: the 11-grade severity of pain and numbness in body parts, JOACMEQ, HADS and the SF-36. In general, $\rho = 0.1$ is regarded as a weak association, $\rho = 0.3$ as a moderate association and $\rho = 0.5$ as a strong association [10]. The discriminative validity was evaluated by performing analysis of variance (ANOVA) between two versions of the NDI and the symptom severity.

Table 2 The outcomes of the first survey

	N	Mean	SD	Min	Median	Max
Japanese NDI (0–100)						
Original	118	26.9	17.1	0	26	72
Modified	118	29.9	15.5	0	28	70
Pain (0–10)						
Head	130	1.6	2.3	0	1	8
Neck	130	4.2	2.8	0	4	10
Back	128	3.0	2.7	0	2	10
Upper ext	128	3.5	2.9	0	3	10
Lower back	129	2.8	2.9	0	2	10
Lower ext	128	2.4	3.0	0	1	10
Numbness (0–10)						
Head	129	1.0	2.0	0	0	9
Neck	129	1.8	2.5	0	0	9
Back	126	1.7	2.4	0	0	10
Upper ext	128	3.9	2.8	0	4	10
Lower back	128	1.7	2.7	0	0	10
Lower ext	129	2.7	3.1	0	1	10
JOACMEQ (0–100)						
Cervical	127	60.0	27.8	0	62.5	100
Upper ext	129	84.3	19.1	0	85.7	100
Lower ext	126	74.6	22.8	16.7	75	100
Bladder	128	76.9	19.8	20	80	100
QOL	124	49.1	16.0	6.5	51.6	90.3
HADS (0–21)						
Anxiety	128	6.3	3.9	0	6	18
Depression	127	6.1	4.0	0	6	19
SF-36						
PF (0–100)	129	70.7	22.8	10	80	100
RP (0–100)	129	61.4	27.8	0	62.5	100
BP (0–100)	129	45.9	20.4	0	41	100
GH (0–100)	129	45.7	17.1	0	45	87
VT (0–100)	129	48.4	22.3	0	50	100
SF (0–100)	128	68.5	26.2	0	75	100
RE (0–100)	129	68.1	31.3	0	75	100
MH (0–100)	129	60.9	23.9	5	60	100
PCS	127	34.9	16.5	−10.1	38.2	63.4
MCS	127	45.2	11.6	14.6	46.3	75.1

SD standard deviation, *NDI* Neck Disability Index, *ext* extremity, *JOACMEQ* Japanese Orthopaedic Association Cervical Myelopathy Evaluation Questionnaire, *QOL* quality of life, *HADS* Hospital Anxiety and Depression Scale, *SF36* short form 36, *PF* physical functioning, *RP* role physical, *BP* bodily pain, *GH* general health, *VT* vitality, *SF* social role, *RE* role emotional, *MH* mental health, *PCS* Physical Component Score, *MCS* Mental Component Score

Reliability and responsiveness

The two versions of the NDI were evaluated by calculating the intraclass correlation coefficient (ICC) of first and second NDI in patients who reported being "unchanged" in the PGIC of the second survey. The ICC ranged from 0 to 1, and a higher value indicated higher repeatability. An ICC above 0.70 is accepted as good [11].

Responsiveness is the ability of an instrument to detect clinically relevant change over time. The responsiveness was evaluated from the data of patients who reported that they were "much better," "better" or "slightly better" in the PGIC of the second survey. We calculated the effect size and the standard response mean (SRM) from these data. The effect size was judged to be small if it was less than 0.2, moderate if it was around 0.5 and large if it was greater than 0.8 [10]. A higher SRM indicates higher responsiveness. We also calculated the correlation between change of the NDI and PGIC. Statistical analysis was performed by IBM SPSS 17.0 (IBM, Chicago, IL, USA).

Table 3 The Cronbach's α values of the original and modified NDIs

	Original NDI		Modified NDI	
	N	Cronbach α	*N*	Cronbach α
Neck pain	26	0.90	25	0.84
Radiculopathy	40	0.91	41	0.90
Myelopathy	52	0.94	52	0.92
Total	118	0.92	118	0.89

Results

The first survey was performed from March 2010 to October 2010, and 130 patients completed the first study. The mean patient age was 59.4 ± 13.8 years (range 22–88 years), and there were 88 male and 42 females. The patient characteristics are shown in Table 1. The pain duration averaged 50.3 ± 66.3 months. The interval between the two surveys averaged 56.9 ± 5.6 days. Thirty-four (26.2 %) patients had received no treatment before the first survey, and of the others who had previous or ongoing treatment, 89 (68.5 %) received therapeutic drugs, 59 (45.4 %) had surgery, and 11 (8.5 %) received physical therapy (% greater than 100 because of multiple choices). The symptom severity judged by surgeons was mild in 44 (33.9 %), moderate in 70 (53.9 %) and severe in 16 (12.3 %) patients.

Twenty-eight (21.5 %) patients were classified into the neck pain group, 45 (34.6 %) into the radiculopathy group and 57 (43.9 %) into the myelopathy group. The number of patients who underwent surgical treatment after the first survey was 1 (3.6 %) in the neck pain group, 7 (15.6 %) in the radiculopathy group and 6 (10.5 %) in the myelopathy group.

The original NDI and the modified NDI of the first survey were 26.9 ± 17.1 and 29.9 ± 15.5, respectively (Table 2). No response was frequently found (6.9 and 8.5 %, respectively) for the question about driving. The ceiling effect of individual questions was small (0 to 4.8 %), but the floor effect was found more frequently in the original NDI than in the modified NDI (5.1 vs. 0.9 %). In both NDIs, the floor effect was significant for question 5 (about headaches) and 9 (about sleep) (45.3–50.8 %). The results of the NRSs, JOACMEQ, HADS and SF-36 are shown in Table 2.

In the second survey, 118 patients responded. The response to the PGIC was "much better" in 7 (5.9 %) patients, "better" in 24 (20.3 %), "slightly better" in 21 (17.8 %), "unchanged" in 55 (46.6 %), "slightly worse" in 5 (4.2 %), "worse" in 5 (4.2 %) and "much worse" in 1 (0.9 %) patient.

Internal consistency, criterion-related validity and distinctive validity

The Cronbach α of the original NDI and the modified NDI were 0.92 and 0.89, respectively (Table 3). The subgroup analysis of the three groups showed good to excellent values for Cronbach's α.

The majority of parameters had a statistically significant correlation with the NDIs (Table 4). The original NDI had higher CCs for pain severity in the neck and back. The modified NDI had a higher correlation than the original NDI in some domains: numbness in the upper extremities, lower back and lower extremities; the upper/lower extremity function in the JOCMEQ; all mental health domains and the MCS in the SF36.

There was a statistically significant difference in the symptom severity for the modified NDI (ANOVA, $p = 0.020$), but not for the original NDI ($p = 0.142$).

Reliability and responsiveness

A total of 118 patients responded to the PGIC questionnaire, and 55 patients (46.6 %) answered "unchanged" in the PGC in the second survey. Their responses were analyzed for the test–retest repeatability. The ICC of the original and modified NDI was accepted as good (0.77 and 0.78, respectively).

Spearman's ρ between the two versions of the NDI and the PGIC was 0.47 ($p < 0.0001$) in the original NDI and 0.59 ($p < 0.0001$) in the modified NDI (Fig. 2).

Fifty-two patients (44.1 %) reported a positive change at the second survey ("much better," "better" and "slightly better"). The effect size of the original and modified NDI was judged to be moderate (0.55 and 0.64, respectively). The SRMs of the original and modified NDI were −0.52 and −0.66, respectively.

Discussions

Our study demonstrated that both of the Japanese NDIs had good to excellent validity, repeatability and responsiveness.

We compared the internal consistency and repeatability of the Japanese NDI with the NDIs in other languages (Table 5) and found that the internal consistency of the Japanese NDI was comparable to the NDI in other languages. The reliability was marginally acceptable, possibly

Table 4 Correlations between the two versions of the NDI and other outcomes

	N	Original NDI		Modified NDI	
		Spearman	*p* value	Spearman	*p* value
Pain (0–10)					
Head	118	0.374	<0.0001	0.370	<0.0001
Neck	118	0.635	<0.0001	0.486	<0.0001
Back	117	0.601	<0.0001	0.555	<0.0001
Upper ext	117	0.455	<0.0001	0.499	<0.0001
Lower back	117	0.221	0.017	0.219	0.018
Lower ext	117	0.271	0.003	0.319	0.001
Numbness (0–10)					
Head	118	0.306	0.001	0.347	<0.0001
Neck	118	0.435	<0.0001	0.443	<0.0001
Back	115	0.407	<0.0001	0.416	<0.0001
Upper ext	116	0.402	<0.0001	0.481	<0.0001
Lower back	117	0.256	0.001	0.327	<0.0001
Lower ext	117	0.286	<0.0001	0.371	<0.0001
JOACMEQ (0–100)					
Cervical	116	−0.397	<0.0001	−0.369	<0.0001
Upper ext	117	−0.385	<0.0001	−0.454	<0.0001
Lower ext	115	−0.363	<0.0001	−0.427	<0.0001
Bladder	118	−0.191	0.039	−0.206	0.026
QOL	115	−0.677	<0.0001	−0.686	<0.0001
HADS (0–21)					
Anxiety	116	0.415	<0.0001	0.414	<0.0001
Depression	117	0.426	<0.0001	0.455	<0.0001
SF36					
PF (0–100)	117	−0.526	<0.0001	−0.551	<0.0001
RP (0–100)	117	−0.599	<0.0001	−0.607	<0.0001
BP (0–100)	117	−0.64	<0.0001	−0.669	<0.0001
GH (0–100)	117	−0.501	<0.0001	−0.510	<0.0001
VT (0–100)	117	−0.518	<0.0001	−0.597	<0.0001
SF (0–100)	116	−0.422	<0.0001	−0.483	<0.0001
RE (0–100)	117	−0.523	<0.0001	−0.580	<0.0001
MH (0–100)	117	−0.413	<0.0001	−0.482	<0.0001
PCS	115	−0.602	<0.0001	−0.617	<0.0001
MCS	115	−0.336	<0.0001	−0.410	<0.0001

NDI Neck Disability Index, *Ext* extremity, *JOACMEQ* Japanese Orthopaedic Association Cervical Myelopathy Evaluation Questionnaire, *QOL* quality of life, *HADS* Hospital Anxiety and Depression Scale, *SF36* short form 36, *PF* physical functioning, *RP* role physical, *BP* bodily pain, *GH* general health, *VT* vitality, *SF* social role, *RE* role emotional, *MH* mental health, *PCS* Physical Component Score, *MCS* Mental Component Score

because of the long interval between the two surveys; the interval between the two surveys ranged from 1 day to 2 weeks in other studies except for one subgroup. We selected an 8-week interval between the two surveys because we had planned to evaluate both the repeatability and responsiveness by separating patients into two groups based on the PGIC of the second survey.

The majority of past reports demonstrated the validity of the NDI in the neck pain population. Few validation studies of the NDI were performed in patients with cervical radiculopathy/myelopathy, who do not always have neck pain, though many studies have adopted the NDI as an assessment following conservative or surgical treatment. With regard to the patients with radiculopathy, only Cleland et al. [13] reported a good test–retest reliability (ICC = 0.68) in 38 radiculopathy patients. The Korean NDI developed by Song et al. [21] demonstrated the validity and reliability in a mixed population that included radiculopathy and myelopathy patients.

Patients who have neurological symptoms often complain not only of pain but also variable symptoms: tingling, burning, numbness, etc. Patients with spinal disorders often complain of numbness and insist that it is different from pain, although numbness is usually regarded as one of the symptoms of neuropathic pain [23]. In a study of 892 patients with cervical ossification of the posterior

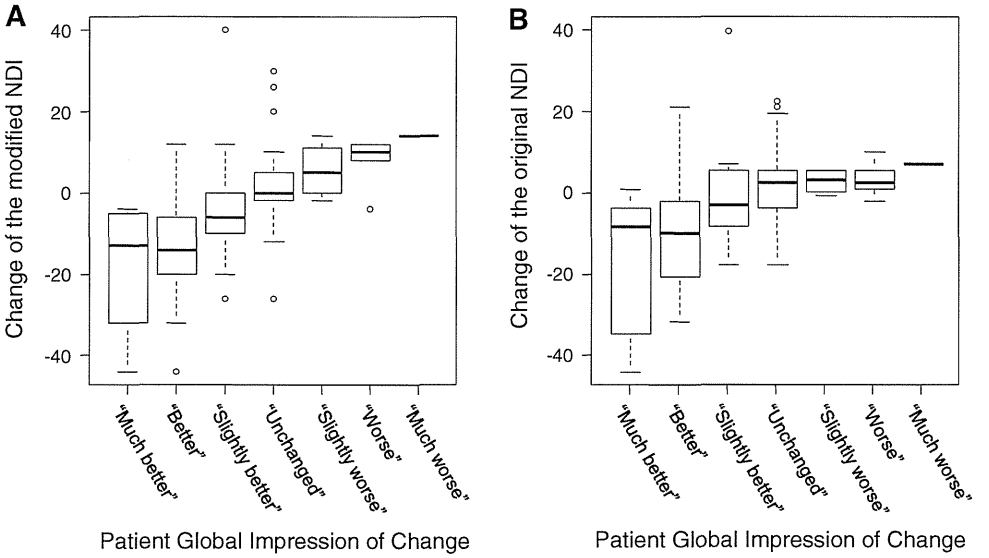

Fig. 2 The relationship between the change in the NDI and the patient global impression of change (PGIC). **a** The modified NDI: Spearman's $\rho = 0.588$ ($p < 0.0001$, $n = 106$). **b** The original NDI: Spearman's $\rho = 0.467$ ($p < 0.0001$, $n = 106$)

Table 5 The internal consistency and reliability of the NDI in various languages

	N	Condition	Cronbach α	ICC/interval
English [1]	52	Neck pain	0.8	0.89/2 days
French [12]	101	Neck pain	na	0.93/1 day
Swedish [13]	59	Neck pain	na	0.97/2 days (chronic)
				0.94/3 months (chronic)
				0.89/2 days (acute)
Dutch [14]	187	Acute neck pain	na	0.90/1 week
Brazilian Portuguese [15]	203	Trauma, OA	0.74	0.92/1 day
				0.48/1 week
Greek [16]	65	Neck pain	0.85	0.93/1–2 weeks
Iranian [17]	185	Neck pain	0.88	0.90/2 days
Catalan [18]	150	Whiplash	0.87	na
Spanish [19]	221	Neck pain	0.89	0.88/2 weeks
Turkish [20]	88	Chronic neck pain	na	0.979
Korean [21]	78	Radiculopathy (50)	0.82	0.93/2 days
		Myelopathy (28)		
Chinese [22]	125	Neck pain	0.89	0.95/1 day
Japanese (present study)	130	Neck pain (28)	0.92 (original)	0.77/8 weeks (original)
		Radiculopathy (45)	0.89 (modified)	0.78/8 weeks (modified)
		Myelopathy (57)		

NDI Neck Disability Index, *na* not available, *OA* osteoarthritis

longitudinal ligament [24], the researchers had asked, "Which is more troublesome, pain or numbness?" Of these patients, 45.0 % responded "both pain and numbness," 25.0 % responded "numbness" and 22.2 % responded "pain." Their result indicates the clinical importance of numbness, which is often regarded by patients as another entity different from pain. In the present study, the modified NDI had a higher criterion-related validity in numbness and mental health-related QOL, while the original NDI had a higher criterion-related validity in neck pain. In other words, the inclusion of numbness in the questionnaire enhanced the validity of the NDI in the assessment of

patients with cervical disorders. In addition, the modified NDI had a higher correlation with the assessment by both physicians and patients and had a higher effect size and SRM than the original NDI. Accordingly, the modified NDI may be a better choice for studies of patients with cervical disorders. On the other hand, the original NDI is still useful for epidemiological studies of nonspecific neck pain.

In summary, we demonstrated the validity, reliability and responsiveness of both versions of the Japanese NDI, and the modified NDI more accurately reflected the numbness and mental health-related QOL, while the original NDI better reflected the neck pain.

Conflict of interest The authors declare that K. Takeshita received payment for lectures that had no direct relationship with the submitted work from Pfeizer Japan Inc., Tokyo, Japan.

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原著 Original Article

日本整形外科学会腰痛評価質問票(JOABPEQ),日本整形外科学会頚髄症評価質問票(JOACMEQ)の認知度調査

Questionnaire Survey of JOABPEQ and JOACMEQ

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要 旨

日本整形外科学会腰痛評価質問票(JOABPEQ)および日本整形外科学会頚髄症評価質問票(JOACMEQ)の認知度,問題点を知る目的で,2011年2月に日本脊椎脊髄病学会の全会員3459名へアンケート用紙を郵送し,297人(回収率8.6%)より回答が得られた.JOABPEQ,JOACMEQは,日本脊椎脊髄病学会脊椎脊髄外科指導医の約5割,指導医以外の約3割程度にしか使用されておらず,「煩雑で使いにくい」,「集計が大変」,「集計結果の解釈が難しい」といった印象を持っている医師が多かった.

Abstract

We conducted the questionnaire survey to investigate that how many doctors knew Japanese Orthopaedic Association Back Pain Evaluation Questionnaire (JOABPEQ) and Japanese Orthopaedic Association Cervical Myelopathy Evaluation Questionnaire (JOACMEQ), or what the problems of JOABPEQ and JOACMEQ were. We sent a questionnaire to 3459 members of The Japanese Society for Spine Surgery and Related research (JSSR) in February 2011 and 297 members replied (collection rate : 8.6%). Only 50% of board-certified spine surgeons of JSSR and 30% of other members of JSSR have used JOABPEQ and JOACMEQ. Most members had the impression that it was difficult to use JOABPEQ and JOACMEQ because they were complicated, that adding up the results of JOABPEQ and JOACMEQ was hard task, and that it was difficult to interpret their results.

Key words : 日本整形外科学会腰痛評価質問票(JOABPEQ),日本整形外科学会頚髄症評価質問票(JOACMEQ),アンケート調査(questionnaire survey)

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はじめに

現代の医療において，治療成績評価には医療従事者主体の評価のみでは不十分で，患者立脚型評価の重要性が指摘されるようになり，2007年5月に患者立脚型で多面的評価が可能な日本整形外科学会腰痛評価質問票(以下JOABPEQ)および日本整形外科学会頚髄症評価質問票(以下JOACMEQ)が発表された．しかし本評価法が十分に広まっているとは言えない．そこで今回，JOABPEQ・JOACMEQがどの程度使用されているか，本質問票の問題点は何か，などを知る目的でアンケート調査を行った．

対象と方法

2011年2月に，日本脊椎脊髄病学会の全会員3459名へ無記名式アンケート用紙を郵送し，書面にて本調査の趣旨を説明し回答を依頼した．297人より回答が得られた(回収率8.6%)．アンケートの内容を表1に示す．

結　果

卒後年数は，21年以上が176人(59.3%)，16～20年が51人(17.2%)，11～15年が49人(16.5%)，6～10年が21人(7.1%)で，日本脊椎脊髄病学会脊椎脊髄外科指導医(以下，指導医)は184人(62%)であった．勤務状況は大学以外の勤務医が159人(53.5%)で，大学勤務医が78人(26.3%)，開業医が54人(18.2%)，その他6人(2%)であった．以下質問4～質問11に対しては，指導医(184人)と指導医以外(113人)に分けて集計し表2～表7に示した．

JOABPEQ・JOACMEQを知っているのは指導医で178人(96.7%)，指導医以外は79人(69.9%)であった(表2)．JOABPEQ・JOACMEQに対する印象は指導医，指導医以外ともに「有用」が最も多かったが，「煩雑で使いにくい」，「集計が大変」，「集計結果の解釈が難しい」といった否定的な意見も多くみられた(表2)．JOABPEQの使用状況に関しては，「積極的に使用している」と回答した医師は指導医71人(38.6%)，指導医以外22人(19.5%)であるのに対して，「使用したことはあるが，現在は使用していない」あるいは「使用したことがない」と回答した医師は指導医93人(50.5%)，指導医以外77人(68.1%)であった(表3)．また，最も多くの医師に使用されている腰痛治療評価法は指導医，指導医以外ともにJOAスコアで，次いでVASであった(表4)．JOACMEQの使用状況に関しては，「積極的に使用している」と回答した医師は指導医71人(38.6%)，指導医以外21人(18.6%)であるのに対して，「使用したことはあるが，現在は使用していない」あるいは「使用したことがない」と回答した医師は指導医102人(55.4%)，指導医以外84人(74.3%)であった(表3)．また，最も多くの医師に使用されている頚椎症性脊髄症治療評価法は指導医，指導医以外ともにJOAスコアで，次いでVASであった(表5)．

JOABPEQ・JOACMEQを今後使用するかどうかに関しては，「両方とも使用する」と回答した医師は指導医110人(59.8%)，指導医以外49人(43.4%)で，「両方とも使用しない」と回答した医師は指導医59人(32.1%)，指導医以外53人(46.9%)であった(表6)．今後も使用しない理由としては，指導医，指導医以外ともに「患者に説明するのが煩雑」，「集計が大変」，「結果の解釈が難しい」が多く，指導医以外では「関心がない」と回答した医師も多かった(表7)．また質問5および質問11のその他の意見として複数みられたのは，「下肢痛の評価ができない」，「患者が質問内容を理解しづらい」などであった．

考　察

これまで脊椎疾患の治療成績評価にはJOAスコアが広く使用されてきたが，これは医療従事者主体の評価法であった．しかし治療成績の最終的評価は患者にあり，そして患者の持つ問題は多面的であるため，治療成績もその観点から評価する必要がある．また，evidence-based medicineが唱えられる中，さまざまな基準に科学性が求められている．このような背景から日本整形外科学会が患者立脚型で，多面的評価が可能な日本整形外科

表1　アンケートの内容

Q1. 先生の卒後経過年数をお教え下さい. 1) 1～5年, 2) 6～10年, 3) 11～15年, 4) 16～20年, 5) 21年以上
Q2. 先生がお持ちの資格をお教え下さい. (複数回答可) 1) 日本整形外科学会専門医, 2) 日本整形外科学会脊椎脊髄病医, 3) 日本脊椎脊髄病学会脊椎脊髄外科指導医, 4) いずれも持っていない
Q3. 勤務状況をお教え下さい. 1) 開業している, 2) 勤務(大学以外)している, 3) 勤務(大学)している
Q4. JOABPEQ, JOACMEQを知っていますか. 1) 知っている, 2) 知らない
Q5. JOABPEQ, JOACMEQに対してどのように思われますか. (複数回答可) 1) とても有用である, 2) 有用である, 3) 有用ではない, 4) 煩雑で使いにくい, 5) 集計が大変である, 6) 集計結果の解釈が難しい, 7) 関心がない, 8) その他
Q6. JOABPEQを使用したことがあるかお教え下さい. 1) 積極的に使用している, 2) 時々使用している, 3) 使用したことはあるが, 現在は使用していない, 4) 使用したことがない
Q7. 腰痛の治療評価には主に何を使用していますか. (複数回答可) 1) JOAスコア, 2) VAS, 3) RDQ, 4) JOABPEQ, 5) 何も使用していない, 6) その他
Q8. JOACMEQを使用したことがあるかお教え下さい. 1) 積極的に使用している, 2) 時々使用している, 3) 使用したことはあるが, 現在は使用していない, 4) 使用したことがない
Q9. 頚椎症性脊髄症の治療評価には主に何を使用していますか. (複数回答可) 1) JOAスコア, 2) VAS, 3) SF-36またはSF-12, 4) JOACMEQ, 5) 何も使用していない, 6) その他
Q10. JOABPEQとJOACMEQを今後患者さんに使用しますか. 1) 両方とも使用する, 2) JOABPEQのみ使用する, 3) JOACMEQのみ使用する, 4) 両方とも使用しない
Q11. Q10で2, 3, 4と回答された先生に質問します. 使用しない理由を教えて下さい. (複数回答可) 1) 患者に説明するのが煩雑であるから, 2) 集計が大変であるから, 3) 集計結果の解釈が難しいから, 4) 理学所見の評価が入っていないから, 5) 有用でないから, 6) 関心がないから, 7) その他

表2　JOABPEQ・JOACMEQの認知度および印象

	指導医 (184人)	指導医以外 (113人)
質問4		
知っている	178人(96.7%)	79人(69.9%)
知らない	6人(3.3%)	34人(30.1%)
質問5		
とても有用である	17人(9.2%)	5人(4.4%)
有用である	85人(46.2%)	36人(31.9%)
有用ではない	3人(1.6%)	2人(1.8%)
煩雑で使いにくい	68人(37.0%)	34人(30.1%)
集計が大変である	56人(30.4%)	22人(19.5%)
集計結果の解釈が難しい	52人(28.3%)	21人(18.6%)
関心がない	8人(4.3%)	19人(16.8%)
その他	14人(7.6%)	15人(13.3%)

質問5は複数回答を含む

学会腰痛評価質問票(JOABPEQ)および日本整形外科学会頚部脊髄症評価質問票(JOACMEQ)を作成し[4]，その信頼性，妥当性は十分に証明された[1,2,8]．

しかし問題点を指摘する報告もみられ，渡辺ら[6]はJOABPEQの問題点として，下肢神経症状の評価ができない点を指摘し，田口ら[5]は自記式の評価のため設問項目を十分に患者に説明することが大切であると指摘しており，今回の調査でも同様のコメントが記載されていた．

今回の結果では，指導医の間ではJOABPEQ・JOACMEQの認知度は高かったが，指導医以外の医師の間では本質問票は十分に知られていなかった．またJOABPEQ・JOACMEQを使用していない医師は指導医では約5割，指導医以外では約7割みられ，さらに両質問票を今後使用すると回答した医師は指導医では約6割，指導医以外では約4割のみであり，多くの医師に受け入れられていないことがわかった．特に指導医では，本質問票の認知度は高いにもかかわらず，使用しないという現状がわかった．本質問票は患者の持つ問題を多面的に評価するためJOAスコアと比べると複雑であり，JOABPEQでは疼痛関連障害，腰椎機能障害，歩行機能障害，社会生活障害，心理的障害の5つのドメインに，JOACMEQでは頚椎機能，上肢機能，下肢機能，膀胱機能，QOLの5つのド

表3　JOABPEQ・JOACMEQの使用状況

質問6　質問8	指導医(184人)		指導医以外(113人)	
	JOABPEQ	JOACMEQ	JOABPEQ	JOACMEQ
積極的に使用している	71人(38.6%)	71人(38.6%)	22人(19.5%)	21人(18.6%)
時々使用している	20人(10.9%)	11人(6.0%)	14人(12.4%)	8人(7.1%)
使用したことはあるが，現在は使用していない	37人(20.1%)	30人(16.3%)	20人(17.7%)	20人(17.7%)
使用したことがない	56人(30.4%)	72人(39.1%)	57人(50.4%)	64人(56.6%)

表4　腰痛の治療に対して使用している評価法

質問7	指導医(184人)	指導医以外(113人)
JOAスコア	145人(78.8%)	79人(69.9%)
VAS	117人(63.6%)	64人(56.6%)
RDQ	38人(20.7%)	10人(8.8%)
JOABPEQ	73人(39.7%)	21人(18.6%)
使用していない	4人(2.2%)	17人(15.0%)
その他	17人(9.2%) (ODI 9人，SF-36 5人など)	2人(1.8%) (ODI 2人)

複数回答を含む

表5　頚椎症性脊髄症の治療に対して使用している評価法

質問9	指導医(184人)	指導医以外(113人)
JOAスコア	167人(90.8%)	97人(85.8%)
VAS	63人(34.2%)	43人(38.1%)
SF-36またはSF-12	31人(16.8%)	10人(8.8%)
JOACMEQ	66人(35.9%)	21人(18.6%)
使用していない	3人(1.6%)	7人(6.2%)
その他	6人(3.3%) (NDI 2人など)	5人(4.4%)

複数回答を含む

表6　JOABPEQ・JOACMEQを今後使用するか？

質問10	指導医(184人)	指導医以外(113人)
両方とも使用する	110人(59.8%)	49人(43.4%)
JOABPEQのみ使用する	11人(6.0%)	9人(8.0%)
JOACMEQのみ使用する	4人(2.2%)	2人(1.8%)
両方とも使用しない	59人(32.1%)	53人(46.9%)

表7　JOABPEQ・JOACMEQを今後も使用しない理由

質問11	指導医(184人)	指導医以外(113人)
患者に説明するのが煩雑	40人(21.8%)	21人(18.6%)
集計が大変	38人(20.7%)	21人(18.6%)
集計結果の解釈が難しい	32人(17.4%)	19人(16.8%)
理学所見の評価が入っていない	9人(4.9%)	2人(1.8%)
有用でない	1人(0.5%)	4人(3.5%)
関心がない	8人(4.3%)	16人(14.2%)
その他	13人(7.1%)	15人(13.3%)

複数回答を含む

メインに分かれていて，ドメインごとに評価しなければならない．これが原因で，「患者に説明するのが煩雑」，「集計が大変」，「結果の解釈が難しい」といった印象を多くの医師に与えていると思われた．本質問票をさらに広く使用してもらうためには，患者立脚型で多面的評価の必要性を啓蒙しつつ，今回指摘された問題点を少しずつ解決していく必要があると考えられた．

結　語

2011年2月の時点で，JOABPEQ・JOACMEQは日本脊椎脊髄病学会脊椎脊髄外科指導医以外の医師には十分に知られておらず，指導医の約5割，指導医以外の約3割程度にしか使用されていなかった．本質問票をさらに広く使用してもらうためには，啓蒙活動を行いつつ，今回指摘された問題点を少しずつ解決していく必要があると考えられた．

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別冊整形外科 63：50～54, 2013

●別冊整形外科 No.63

〈腰椎疾患 up-to-date〉

腰椎椎間板ヘルニア手術に対する患者の満足度と日本整形外科学会腰痛評価質問票（JOABPEQ）における評価

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2013年

腰椎椎間板ヘルニア手術に対する患者の満足度と日本整形外科学会腰痛評価質問票（JOABPEQ）における評価*

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[別冊整形外科 63：50～54，2013]

はじめに

日本整形外科学会腰痛評価質問票（Japanese Orhopaedic Association Back Pain Evaluation Questionnaire：JOABPEQ）は，従来の日本整形外科学会腰痛治療成績判定基準（JOA スコア）が治療者主体の評価であったのに対し，患者立脚，多面的評価，科学性の三つを基本方針として，2007 年 4 月に公表された新しい評価基準である．これは疼痛関連障害，腰椎機能障害，歩行機能障害，社会生活障害，心理的障害という 5 つのドメインに分類されており，各々に点数評価する評価法[1～6]である．

日本脊椎脊髄病学会の診断評価等基準委員会では，2008 年 4 月より JOABPEQ における患者評価の妥当性に関する多施設共同研究を開始した．その目的の一つとして，JOABPEQ における腰椎椎間板ヘルニアの治療成績に対する評価の有効性についての検証がある．

本稿の目的は，腰椎椎間板ヘルニアの手術効果がどのように反映されるかを検討するもので，これまでに当委員会で集積された手術前後の JOABPEQ，およびこれとは別に聴取した手術の効果に対する患者満足度のアンケート（patient satisfaction score：PSS）結果との整合性を検証することである．

Ⅰ．対象および方法

当委員会で集積した腰椎椎間板ヘルニア手術のエントリー数は，2012 年 1 月の時点で 115 例であるが，術前および術後 6 ヵ月の追跡時の各データに欠測値なく評価できた症例は，術前 74 例に対して 70 例（94.6%）であった．調査項目は JOABPEQ，visual analogue scale（VAS）および PSS である．

PSS は当委員会が独自に作成したもので，JOABPEQ の項目に準じ，痛み，日常の動作，歩行，仕事や家事のしやすさの状態，気分的な状態や健康状態の 5 項目について各 4 段階（1：大きく良くなった，2：良くなった，3：あまり変わらない，4：悪くなった）で評価する．各段階に対して 0～3 点を加算するもので，最高 12 点となる（図 1）．今回の検討では JOABPEQ の 5 因子と PSS との関連，VAS と PSS との関連について分析した．統計学的

Key words
JOABPEQ，validation study，lumbar disc herniation

*Japanese Orthopaedic Association Back Pain Evaluation Questionnaire（JOABPEQ）and patient satisfaction score in patients with lumbar disc herniation
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