

Knowledge and attitudes of Iranian patients with regard to lumbar puncture

Afshin Borhani-Haghghi, MD, Razieh Rezaei, MD, Samaneh Etemadi, MD, Haleh Ghaem, PhD, Abolhamid Shariat, MD.

ABSTRACT

الأهداف: سبب الرفض المنتشر للبزل القطني (LP) بين المرضى في مجتمعنا. قمنا بدراسة معرفتهم وسلوكهم تجاه هذا الأسلوب المتبعة، ومضاعفاته، ودعائي استعماله.

الطريقة: في استبيان المرضى الذين راجعوا عيادة الأعصاب الخارجية - مستشفى نميز - شيراز - إيران خلال الفترة من يناير 2007 حتى يناير 2008م تمت دعوتهم لإكمال الاستبيان المحتوي على التغيرات المغáfافية، والدیموغرافية، والخبرة مع LP، والمضاعفات، والمعرفة، والسلوك تجاه LP.

النتائج: تم جلب 410 مريض (58%) إناث وكان متوسط العمر 33.2 ± 2.7 عام. ظهرت معرفة ضئيلة تجاه LP 92.6%. كان هناك صلة بين الشك في LP وعدم وجود معلومات كافية $p=0.00007$. كانت هناك صلة بين ضعف الحالة الاجتماعية، و ضعف مستوى التعليم، والإقامة في المناطق الريفية مع قلة المعلومات عن LP، ولكن هناك سلوك إيجابي ومعلومات جيدة بشكل مثير لمن لديه خبرة مع LP من قبل.

خاتمة: إن السيطرة على عدم رغبة المرضى بتعاطي LP ممكنة عبر نشر الوعي عن دعائي استعمالاته، و موانع الاستعمالات، والأعراض الجانبية.

Objective: To investigate the knowledge and attitudes of patients towards lumbar puncture (LP), its complications, and indications.

Methods: In a questionnaire survey, patients who were referred to the general neurology outpatient clinic at Nemazee Hospital in Shiraz, Iran, from January 2007 to January 2008 were invited to complete a questionnaire consisting of items on demographic and socioeconomic variables, experiences with LP and complications, and knowledge of and attitudes regarding LP.

Results: A total of 410 patients were recruited (58% women, mean age 33.2 ± 2.7 years). Poor knowledge of LP was highly prevalent (92.6%), and negative attitudes toward LP were also common (63%) among our patients. Skepticism regarding LP was directly

related to lack of information ($p=0.00007$). Lower socioeconomic status, lower educational level, and residence in rural areas were associated with being less well informed about LP, but interestingly those who had experience with LP before were better informed and had more positive attitudes.

Conclusion: It is possible to overcome reluctance to undergo LP through education of its indications, contraindications, and complications.

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From the Departments of Neurology (Borhani-Haghghi, Shariat) and Epidemiology (Ghaem), Comparative Medicine Research Center (Borhani-Haghghi), and Student Research Committee (Rezaei, Etemadi), Shiraz University of Medical Sciences, Shiraz, Iran.

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Address correspondence and reprint request to: Dr. Afshin Borhani-Haghghi, Motahhari Clinic, Nemazee Square, Shiraz, Iran. Tel. +98 (711) 6121065. Fax. +98 (711) 6272287. E-mail: borhanihaghghi@yahoo.com

Although lumbar puncture (LP) is a relatively invasive procedure, it gives valuable information on CSF characteristics and CNS pathologies. There are some reports of the negative attitude of patients or their relatives to the LP procedure.¹ There is also a high refusal rate despite recommendations of medical professionals.² Herein, we studied the knowledge and attitude of Iranian patients regarding LP, complications, and indications to try to understand the causes of patients' reluctance to undergo LP.

Methods. The participants were patients who were referred to the general neurology outpatient clinic at Nemazee Hospital, Shiraz, southern Iran, between January 2007 and January 2008. This clinic is the reference center for patients from the south of Iran. The Ethics Committee of Shiraz University of Medical Sciences approved the study protocol, and all participants included gave their informed consent in writing, and their data were kept confidential. Subjects were selected by systematic random sampling. We

calculated a minimum sample size of 400 participants. Participants who came to the clinic on Saturdays, Mondays, and Wednesdays were invited to take part in the study, until the minimum acceptable sample size was recruited. Educated patients filled out the questionnaire themselves under observation of unbiased previously educated interviewers in a calm environment at the time of referral to the clinic. For uneducated persons, the questionnaire was verbally given and completed by the same interviewers. The inclusion criteria were any neurological disease or disorder, and willingness to participate in the study. The exclusion criteria were dementia, delirium state, mental retardation, dysphasias, and other obstacles of comprehension and completing the questionnaire. High participation levels (only 8 refused to participate) in the study were attributed to simplicity and brevity of the questionnaire used. The patients filled out a questionnaire consisting of 2 parts. The first part included items on demographic and socioeconomic data, experience with LP and complications, and the second section consisted of 21 questions on their knowledge and 13 questions on their attitudes regarding LP. The knowledge questions were scored as yes, no, or I don't know. Each correct response was scored as one, and each incorrect or "I don't know" response was scored as 0. The maximum score for knowledge questions was 21, and the minimum score was 0. The participants were stratified into 3 groups according to their knowledge score: poorly informed patients (score lower than 50%), moderately informed (score between 50-75%) and well informed (score higher than 75%). A Likert scale was used to score the responses to attitude questions from 5 (completely agree) to one (completely disagree). Based on the results of a pilot study with 80 participants, the reliability of the questions proved to be acceptable (Cronbach's alpha=0.7).

The analyses were carried with SPSS software (Statistical Package for the Social Sciences, version 11.5, SSPS Inc, Chicago, IL, USA). The variables were compared with the Kruskal-Wallis or Mann-Whitney tests, when appropriate. The results were considered significantly different when the *p*-value was less than 0.05. We used a linear regression to conduct statistical modeling of a quantitative variable as the dependent variable and to identify covariants.

Results. A total of 410 patients were recruited. High participation levels (only 8 refused to participate) in the study were attributed to simplicity and brevity of the questionnaire used. The mean \pm SD age of the respondents was 33.2 ± 2.7 years, and 172 (42%) patients were male and 238 (58%) female. The mean \pm SD educational years of the respondents was 11.2 ± 4.3 , 84% of them were living in urban areas and 16% in

rural areas, and 10.5% of the participants experienced LP. Of this group, 58.1% suffered from post LP headache, 25.5% from low back pain, and 4.6% from subjective sexual problems. Table 1 shows the frequency of correct and incorrect answers regarding knowledge of LP. The respondents scored 4.0 ± 3.6 in knowledge questions, 92.6% of them were poorly informed, and 7.4% were moderately informed according to former cutoffs. No participant was well informed. Table 2 shows the frequency of states of agreement of different aspects of the LP procedure. Most respondents (63%) had a negative attitude toward LP. Meanwhile, 46.1% of the respondents confessed that did not know enough

Table 1 - Frequency distribution of correct and incorrect answers regarding knowledge of lumbar puncture (LP).

Knowledge questions	I don't know (%)	Correct answers (%)	Incorrect answers (%)
LP can cause paralysis	57.1	25.8	17.1
LP is a very painful procedure	55.7	33.2	11.1
Meningitis is a common complication of LP	72.1	20.1	7.8
LP can cause infertility in men	73.7	17.3	9.0
Doctors perform LP only when they suspect meningitis	64.5	16.2	19.3
Doctors do LP to diagnose some causes of headache	62.0	14.6	23.4
Doctors do LP as a therapeutic method for some causes of headache	62.7	21.7	15.6
LP can cause severe back pain	59.5	23.9	16.6
Doctors can use CT scan or MRI instead of LP for diagnosis	45.2	16.3	38.5
After LP the patient may have urinary incontinence	84.0	10.9	5.1
For LP doctors use aseptic methods	21.2	76.4	2.4
LP needs general anesthesia	60.2	15.9	23.9
A CT scan should be carried out before LP	67.1	27.2	5.7
Performing LP does not require any specific training	31.0	58.3	10.7
Experienced physicians don't need LP for diagnosis	35.6	21.5	42.9
Doctors can use analgesics to reduce pain during LP	68.6	9.7	21.7
LP causes severe complications	49.0	6.5	44.5
LP can cause infertility in women	77.1	17.3	5.6
LP can aggravate the course of the poliomyelitis	72.9	10.5	16.6
There are special needles that can reduce post puncture headache	72.7	19.2	8.1
Paralysis is not an LP complication	66.8	18.1	15.1

Table 2 - Frequency distribution of answers regarding attitudes toward lumbar puncture (LP).

Attitude questions	Completely agree %	Agree %	No opinion %	Disagree %	Completely disagree %
LP is not acceptable in society	27.6	35.4	28.5	5.1	3.4
People don't know the importance of LP as a diagnostic method	46.45	29.65	21.5	1.7	0.7
Informed consent should be obtained from patients or their first-degree relatives	47.85	30.0	18.6	2.25	1.3
Medical students can perform LP	1.4	6.45	28.7	31.5	32.0
LP should be performed by residents	7.8	23.4	38.8	18.3	11.7
LP should be performed at a hospital in a large city	7.8	28.0	52.8	9.1	2.3
LP should be carried out by the highest ranking professional	49.5	30.5	17.5	1.2	1.3
People don't need more education on LP	15.3	9.3	27.3	22.2	25.9
If a hospital doctor tells me I need LP I prefer to be discharged at my own risk	12.4	22.6	41.3	17.0	6.7
If a hospital doctor tells me I need LP I want him or her to explain the procedure	63.7	19.7	12.5	1.9	2.2
The hospital where LP is performed is not important	3.7	15.9	52.4	20.45	7.55

Table 3 - Mean, standard deviation, 95% confidence interval, and *p*-values of knowledge scores according to participant's level of education, income, place of residence, and experience with lumbar puncture.

Variable	N	Mean ± standard deviation	95% confidence interval	P-value
<i>Education level</i>				
Low	118	3.48 ± 3.1	2.54-3.66	0.045
High	223	4.43 ± 3.7	3.22-4.18	
<i>Gender</i>				
Female	238	4.32 ± 3.7	3.23-4.17	0.020
Male	172	33.6 ± 3.5	2.98-4.02	
<i>Income</i>				
Low	146	3.31 ± 3.3	2.77-3.83	
Moderate	206	4.6 ± 3.8	3.28-4.32	0.0006
High	10	6 ± 4.6	1.70-7.50	
<i>Residence</i>				
City	344	4.17 ± 3.6	3.22-3.98	0.00009
Rural	66	3.2 ± 3.44	2.59-4.29	
<i>Experience with lumbar puncture</i>				
Yes	43	6.2 ± 3.2	2.25-4.15	0.00004
No	367	3.7 ± 3.0	3.14-3.86	

about LP, 80% of the subjects stated that a specialist should perform lumbar puncture for them or their relatives, and only 1.4% agreed with performance of LP by medical students. Most of the research population (77.8%) believed the LP should be carried out with informed consent. Table 3 shows the differences between mean score of the knowledge of LP according to respondents' gender, education level, income, area of accommodation, and experience of LP. There was a significant correlation between more knowledge regarding LP and higher education (*p*=0.045), higher income (*p*=0.0006), urban life (*p*=0.00009), and

experience of LP (*p*=0.00004). We also observed a positive association between poor knowledge of, and negative attitude toward LP (*p*=0.00007). There was also a positive association between positive attitude to LP and experience of LP (*p*=0.045). However, there was no significant association between sociodemographic factors and attitude score (*p*=0.13).

Discussion. Our study found a high percentage of poor knowledge of, and negative attitudes toward LP among Iranian patients. It also revealed that skepticism regarding LP is directly related to lack of information.

Lower socioeconomic status, lower educational level, and residence in rural areas were associated with being less well informed regarding LP, but interestingly those who had experience with LP before were better informed and had more positive attitudes.

Our findings are consistent with those of other studies conducted in Asian countries.^{1,2} Although LP complications are infrequent and tolerable,³ our respondents, like those in other studies, are still afraid of paralysis, infertility, urinary incontinence, and other unreal complications. The myth that LP may cause paralysis may have a root in the era before the eradication of poliomyelitis. There is some evidence that LP can shift the course of poliomyelitis from nonparalytic to paralytic.⁴ Although no laboratory-confirmed cases of indigenous polio have been reported in Iran since 1997,⁵ it appears that "LP phobia" is inherited from old generations to new ones. Another false belief among our respondents was that CT and MRI could substitute for CSF analysis to obtain a definite diagnosis of neurological diseases.

Apart from knowledge and attitude, other factors contribute to LP acceptance or rejection. The pain resulting from the procedure was an important reason for patients' refusal to undergo LP in the present study. Using appropriate methods of pre procedural analgesia and informing patients of these methods may increase the acceptance of LP.⁶ In the current study, only 7.3% and 31% of the respondents agreed with LP being performed by medical students or residents. Most respondents (80%) agree that highly experienced professionals should carry out LP. These results are completely consistent with those of previous studies: 58% of the patients in Gruber et al's study⁷ would never allow a student to perform LP regardless of the degree of training. In another study, 89% of the patients said that they would not mind being the first person on whom a supervised medical student performed specific procedure.⁸ Another study has shown that according to patients' preference, only 7% of them would allow medical students to perform their first LP on them.⁹ With respect to the patients' concerns and considering the need of medical students to acquire procedural skills, a solution should be sought for this problem in university hospitals. Patients' willingness to be educated is another important point that our results on attitudes highlight. Participants who had experienced LP before had higher levels of knowledge and better attitudes

toward LP. Their positive attitudes could be used to persuade other patients to accept LP.

Some of our limitations were inevitable shortcomings of questionnaire studies. There was also no reliable and validated questionnaire that was used in previous studies. As a shortcoming, we did not conduct an "open ended" survey before our questionnaire study.

In summary, negative attitudes of patients or their relatives toward LP as a critical tool of decision-making in neurology may cause severe problems in diagnosis and treatment. Our results show that the best way to mitigate this unwillingness is education on the indications, contraindications, and complications of LP, with special efforts targeted to patients with lower educational and socioeconomic levels and residents in rural areas. Education on the procedure and the skills of LP performers can also reassure the patients on the safety of this necessary procedure.

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