



Patients' misperception regarding the difficulty of lumbar puncture

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ABSTRACT

Aim: Lumbar puncture (LP) is a crucial method of diagnosis and treatment of neurological diseases. Despite its importance, the patients' refusal of the procedure leads to difficulties in diagnosis and treatment. One of the main reasons for patients' refusal may be that LP is perceived to be more difficult than it actually is. Our aim was to investigate whether the patients had prejudices against the difficulty of LP treatment.

Methods: Sixty-seven patients aged between 20 and 80 years were included in to the study. Immediately prior to the procedure, each patient was asked to rate the difficulty level of the operation with the Visual Analog Scale (VAS) as 0 very easy to 10 very difficult. The cause of the LP, pre-diagnosis, education status, age and sex, presence of complications and the title of the physician performing the LP were recorded.

Results: A total of 20 patients refused the procedure (29.3%). Of the 47 patients, who had the procedure performed, 21 were female and 26 were male. Twenty-seven LP were performed by first-year assistant and 21 were performed by second-year assistant. Patients' mean VAS scores before the LP were 7.9 ± 2.0 and were 4.1 ± 2.9 after the LP. Post-procedure VAS scores were significantly lower than pre-procedural VAS scores ($p < 0.001$). The mean value of the VAS scores of the patients, whose LPs were performed by 1st year assistant, was 5.6 ± 3.2 and the mean value of the VAS scores of the patients, whose LPs were performed by 2nd year assistant, was 3 ± 2.2 . There was a significant difference between two patient groups ($p = 0.004$).

Conclusions: The patient perception of the lumbar puncture is perceived to be worse than it actually is. Therefore, it is very important to provide sufficient information to the patients about the LP and to inform them about the necessity of the procedure.

Keywords: Lumbar puncture; misperception; lumbar puncture difficulty; visual analog scale.

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Introduction

Lumbar puncture (LP) is a very common method used in the diagnosis and treatment of

neurological diseases [1]. LP is used for the diagnosis and treatment of many diseases such as meningitis, encephalitis, demyelinating diseases, and normal pressure hydrocephalus [2, 3]. Despite the importance of diagnosis and treatment, the refusal rate of LP can be up to 25-30% and it is stated that the major barrier for the performing of LP is the patients' refusal to have it performed. This situation blocks diagnosis and treatment and leaves physicians in a difficult situation [4]. It is known that patients have many reasons for refusing LP treatment. It is observed that patients are afraid of the treatment complications such as fear of being disabled by the LP process [5].

One of the most important reasons for patients' refusal may be that LP treatment is perceived more difficult by patients than it actually is. Our clinical observations suggest that there is a serious prejudice against the treatment in patients who had already approved the procedure.

Informed consent is one of the preconditions of good medical practice and is based on the principle of autonomy which is one of the basic principles of medical ethics. Autonomy can be defined as the ability to make decisions on the basis of their own values on behalf of a person or community and to take actions to implement them. As an extension of this, conditions must be met for the autonomous person to participate in all decisions concerning her health. Informed approval process; that the patient is sufficiently informed that she can give or deny any medical treatment to be applied to her, that patient thinks on the information she receives, and makes her decision based on her free choice [6, 7].

In the present study, the difficulty ratings of the intervention perceived by the patients undergoing LP were recorded and it was aimed to investigate whether the patients had

prejudices against the difficulty of LP treatment.

Methods

Between March 2017 and December 2017 the data of the patients who underwent elective diagnostic and / or therapeutic lumbar puncture in Bolu Abant İzzet Baysal University, Department of Neurology were recorded consecutively. The study was approved by the local Ethics Committee (no: 2017/144) and conducted in accordance with the Declaration of Helsinki. The informed consent form formed by the Turkish Neurology Association was used in the study process. The informed consent form states clearly the nature of the diagnosis and treatment to be applied, the expected benefits, possible side effects, other diagnostic and treatment options and their characteristics. The informed consent does not include the medical term that would prevent the patients from understanding the procedure. Patients who refused the intervention were also recorded to determine acceptance / refusal rates of the procedure. Patients who had at least one of the LP contraindications such as intracranial mass, ongoing anticoagulant use, thrombocytopenia and coagulopathy and patients with known cognitive dysfunction, who had previously undergone lumbar puncture, were excluded from the study. A total of 20 patients refused the procedure (29.3%). The study was conducted with 47 patients. Age, gender and level of education were not taken into the consideration in the study, and only the patients whose native language was Turkish included in the study.

LP Procedure

LP was performed by 1st and 2nd year assistants experienced in the procedure. Procedure was performed with 22 gauge

Quincke needle (Egemen, Turkey) in a standard protocol from L3-L4 midline [8]. No sedation or local anesthesia was admitted before the procedure. For diagnostic procedures, 8-10 cc was obtained. For therapeutic procedures, 20-30 cc cerebrospinal fluid (CSF) was obtained. All of the LP procedures were done at 10:00 am in the lateral recumbent fetal position. The number of attempts and amount of CSF obtained were recorded.

Assessment

All participants were informed about the study and a written informed consent was obtained from each participant 24 hours before intervention. Immediately prior to the procedure, each patient was asked to rate the difficulty level of the procedure with the Visual Analog Scale (VAS), 0-very easy to 10-very difficult. Immediately after the procedure, each patient was asked to evaluate the degree of difficulty sensed during the procedure. The physicians performing the LP were asked to evaluate the degree of difficulty immediately before and immediately after the procedure with VAS. The reason of the LP performed, pre-diagnosis, educational status, age, gender, presence of complications and the title of the physician performing the procedure were recorded. To achieve $\alpha < 0.05$, and $\beta=95\%$, 41 subjects were required for the study.

Statistical Analysis

All statistical analysis was performed using the SPSS for Windows version 22.0 (SPSS Inc., Chicago, IL, USA). The chi-square test was used to compare the distribution of sex and educational status between the two groups. Independent sample t-test was used to compare the difference between groups in terms of age and VAS. Paired Sample t-Test was used to

compare VAS values before and after the intervention.

Results

Of the 47 patients, 21 were female and 26 were male. Twenty-seven LP treatments were performed by first-year assistant and 21 were performed by second-year assistant.

The mean age of the patients was 48.9 ± 18.2 . 14. 9% of the patients were university graduates, 19.1% were high school graduates and 66% were primary school graduates. The age, gender, education levels, the reasons for the LP, the number of attempts and pre-diagnosis are shown in Table 1. Patients' mean VAS scores before the LP were 7.9 ± 2.0 and 4.1 ± 2.9 after the LP. Post-procedure VAS scores were significantly lower than pre-procedural VAS scores ($p < 0.001$). The mean value of the VAS scores of the patients, whose LPs were performed by 1st year assistant, was (5.6 ± 3.2) and the mean value of the VAS scores of the patients, whose LPs were performed by 2nd year assistant, was (3 ± 2.2). There was a significant difference between the two patient groups ($p = 0.004$). However, there was no significant difference between the pre- and post-procedural VAS scores of 1st year and 2nd year assistant ($p = 0.994$) (Table 2).

Discussion

In the present study, it was determined that patients were more likely perceive the LP more difficult than it actually was. When the difficulty scores of the patients before and after LP were compared, it was found that pre-procedural scores were significantly higher than post-procedural scores. In the literature, rejection rate of LP is up to 25-30% in developing countries [9]. In one study, it was suggested that fear of complications and the belief that LP is unnecessary are the major

Table 1. General characteristics of patients.

Gender (n, %)	
Male	26 (55,3)
Female	21(44,7)
Age (mean±SD, years)	48,9±18,2
Educational status (n, %)	
Primary school	31 (66)
High school	9 (19,1)
University	7 (14,9)
LP reason (n, %)	
Diagnosis	29 (61,7)
Diagnosis & Treatment	18 (38,3)
Prediagnosis (n, %)	
MS	20 (42,6)
NPH	6 (12,8)
CNS infection	7 (15,2)
Pseudotumor cerebri	10 (21,3)
GBS	2 (4,3)
CVT	2 (4,3)
Number of attempt (n, %)	
One	20 (42,6)
Two	20 (42,6)
Three or more	7 (15,2)

MS: Multiple sclerosis, NPH: Normal pressure hydrocephalus, CNS: Central neural system, GBS:Guillan Barre Syndrome, CVT: Cerebral venous thrombosis.

Table 2. Difficulty level of intervention according to the patients and physicians.

	Before the intervention	After the intervention	p value
Patients' VAS	7,9±2,0	4,1±2,9	<0.001
1st year assitant's VAS	-	3,7±1,7	0,994
2nd year assitant's VAS	-	3,7±1,5	
	1st year assitant	2nd year assitant	
Patients' VAS*	5,6±3,2	3±2,2	p=0,004

VAS: Visual analog scale. * Patients' VAS scores, according to the physicians' title performing the intervention.

reasons behind the LP refusal [10]. In our study, 29.8% of patients who had LP indications refused the procedure. Of the patients who refused the LP, six of them expressed that they were afraid of being disabled at the end of the procedure and 14 of them refused because they thought it would be very difficult and painful. There are a few studies in the literature investigating the causes of LP refusal. However, there are not enough suggestions to solve the refusal issue. LP refusal can be reduced by reorganizing the informed consents. Side effects can be explained in more detail and patients may be informed that the procedure is not as painful as he or she thought.

In a study conducted by Borhaghigni et al [11], they found that 90% of the reasons for rejecting LP treatment were associated with inadequate information. In our study, in addition to the patients who refuse the LP at a high rate, it was observed that there was a serious prejudice about the difficulty perception of the procedure even in patients who accepted the procedure. The difficulty VAS scores indicated by the patients after the procedure were significantly lower than before

the procedure started can be considered as an important evidence of this prejudice. There was a significant difference between the mean value of the VAS scores of the patients whose LPs were performed by 1st year assistant and the patients whose LPs were performed by 2nd year assistant. This expected result indicates that as the experience increases, there is a significant decrease in the difficulty perception of the procedure. It suggests that this significant decrease in VAS values would increase if the procedures are performed entirely by experienced physicians. In our study, when the distributions of the education status of the patients were assessed, it is seen that most of them graduated from primary school. This can be a serious prejudice for patients to have sufficient knowledge about the procedure Sulaiman et al reported that [5] they found that the rate of knowledge about the procedure was significantly higher in patients with higher education levels. In our study, there is a heterogeneous distribution in favor of primary school graduates; therefore, a statistical analysis cannot be performed between the VAS scores and education levels. However, it should not be forgotten that the

reason for these prejudices of patients is not only caused by insufficient information. Another shortcoming of our study is that it was conducted on a certain population. In the literature, it has been showed that both the LP refusal and prejudices against the LP are influenced by many factors such as race, ethnicity, gender and occupation [12, 13]. Despite all these limitations, our study showed that there is a wrong conviction in our society about the difficulty of LP. In order to overcome this prejudice it is necessary to inform patient sufficiently. In addition, physicians should explain to the patients that how necessary the procedure is for the treatment and diagnosis, and also it should be stated that it is a frequently applied procedure. Therefore, informed consent form may not be sufficient to advise the patients, and it is critically important to give patients the impression of being trustworthy. Further studies carrying out in more heterogeneous population are needed to assess the prejudice against LP.

Conclusions

Lumbar puncture is perceived to be more difficult than it actually is by patients. Therefore, it is very important to provide sufficient information to the patients about the LP and to inform them about the necessity of the procedure.

Compliance with ethical statements

Conflicts of Interest: None.

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