RESEARCH ARTICLE

Factors affecting parental refusal of lumbar puncture in Iraqi children in COVID-19 era: a cross-sectional study

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Abstract

Objective: To assess the frequency and causes of parental lumbar puncture refusal for their children.

Method: The cross-sectional study was conducted at the Central Child Teaching Hospital, Baghdad, Iraq, from October 1, 2021, to April 1, 2022, and comprised children aged at least >1 month at the emergency department who had been advised to undergo lumbar puncture. Data from the mother of the child was collected using an interview-based questionnaire, exploring. demographic characteristics, the cause of lumbar puncture refusal, as well as knowledge of the advantages and risks of lumbar puncture. Data was analysed using SPSS 26.

Results: There were 128 children with a mean age of 3.9±2.1 years (range: 1-120 months). The parents of 18(14%) patients refused the procedure, and the most frequent reason was fear of paralysis 12(67%). Refusal was significantly associated with mother's age, parents' levels of education, and parents' knowledge of the risks of lumbar puncture ($p<0.05$).

Conclusion: Raising public awareness and parents' educational level regarding the necessity and safety of lumbar puncture procedure is vital to decrease the refusal rate and ensure a better health outcome.

Key Words: Spinal Puncture, Demography, Paralysis, Fear

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Introduction

Lumbar puncture (LP) has been used over the years for a variety of diagnostic purposes, including confirmation or absence of subarachnoid haemorrhage, meningitis, neuro-inflammatory disorders, and indirect estimates of intracranial pressure[1]. LP relies on the analysis of cerebrospinal fluid (CSF), and is considered a key tool in the diagnosis of meningitis as other laboratory markers are unreliable[2]. During the recent coronavirus disease-2019 (COVID-19) pandemic, many acute neurological symptoms prompted CSF testing to exclude concurrent infection among patients[3,4]. LP is a safe procedure when executed by an experienced hand. However, the decision to perform LP is not free of obstacles[5]. A common problem paediatricians encounter is parental refusal and its consequences. In infectious meningitis, failure to do LP frequently results in the provision of empirical use of antibiotics in hospital settings, contributing to antibiotic resistance owing to non-targeted treatment. It also adds to the financial burden owing to increased length of hospital stay (LOS), higher cost and resource usage[6]. Furthermore, delayed diagnosis is associated with neurological complications and significantly higher mortality rates[7,8].

Worldwide, parental LP refusal rates vary, with one study in Iraq showing a high parental LP refusal rate approaching 61%[9]l, which was higher than that reported in regional and global studies[10-17].

Identifying the factors behind parental refusal is of paramount importance as a better understanding of parents' perceptions, beliefs and fears will help develop solutions to obtain parental consent for LP[13]. Earlier studies have identified several causes for parental refusal, but these causes cannot be universalised as parents' attitude towards LP is affected by cultural background that differs from one population to another[17]. In Iraq, factors affecting parental decision regarding LP have been inadequately studied[9]. The current study was planned to fill the gap by assessing the frequency of parental LP refusal, and determining the factors that contribute to parental refusal.

Subjects and Method

The descriptive, cross-sectional study was conducted at the Central Child Teaching Hospital, Baghdad, Iraq, from October 1, 2021, to April 1, 2022, after approval from the ethics review committee of Mustansiriyah University, Baghdad. The sample was raised using convenience, non-probability sampling technique. Those included were children aged at least >1 month at the emergency

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department (ED) wo had been advised to undergo LP regardless of the reason. Children aged <1 month were excluded, and so were those who had undergone LP previously, and children with oncological disorders who had undergone intrathecal injections.

After taking informed consent, data was collected using a questionnaire that was filled during face-to-face interview with mothers conducted by a physician not involved in the management of the patients. The questionnaire was designed in Arabic, and, after being filled, it was translated to English by a person whose native language was English.

The questionnaire was scrutinised by 10 expert evaluators, and this was followed by principal component analysis (PCA) to assess each question's validity. The overall eigenvalue was calculated for the questionnaire as well as from each question. The questions that had higher eigenvalues than the total were excluded.

The questionnaire had two parts. The first part comprised questions about the demographic characteristics of patients and parents, inlcuding age and gender of patients, age, educational level and employment status of the parents, and the urban/rural residence of the family. The second part comprised questions regarding the cause of LP refusal, knowledge of the procedure, its advantages and risks, whether the LP was advised by a specialist or a resident, and whether the patient was admitted or discharged.

Data was analysed using SPSS 26. Data was expressed as mean ± standard deviation or frequencies and percentages, as appropriate. Chi-square test was used to assess the association of parental decision with the study variables. P<0.05 was taken as significant.

Results

There were 128 children with a mean age of 3.9±2.1 years (range: 1-120 months). The parents of 18(14%) patients refused the procedure, and the most frequent reason was fear of paralysis 12(67%) (Table 1).

Refusal was significantly associated with mother's age and parents' levels of education (Table 2)

Table-1: Causes of lumbar puncture refusal (n=18).

Causes of LP refusal	Frequency (%) *
Fear of paralysis	12(67%)
Fear of worsening child illness	8(44.4)
Had no prior knowledge of LP	4(22.2)

*More than one reasons were cited.

Table-2: Association of demographic characteristics with the family decision regarding lumbar puncture (LP).

Variables	Refused LP No (%) (n=18)	Accepted LP No (%) (n=110)	P-value
Gender			
Male	14 (19 %)	60 (81%)	0.064
Female	4 (7.5%)	50 (92.5%)	
Patients age (years)			
<1	7 (12.2%)	50 (87.8%)	0.450
1-3	7 (18.9%)	30 (81.1%)	
4-6	4 (16.6%)	20 (83.4%)	
7 or more	0 (0%)	10 (100%)	
Father's age(years)			
<20	0	0	0.246
21-30	4 (9%)	40 (91%)	
31-40	12 (19.6%)	49 (80.4%)	
41-50	2 (15.3%)	11(84.7%)	
>50	0 (0%)	10(100%)	
Mother's age (years)			
20	0 (0%)	30 (100%)	0.015*
21-30	14 (18.9%)	60 (81.1%)	
31-40	4 (28.5%)	10 (71.5%)	
41-50	0 (%)	10 (100%)	
>50	0	0	
The educational level of father			
Illiterate	10 (100%)	0 (0%)	0.001*
Primary	5 (16.7%)	70 (83.3%)	
Secondary	3(16.7%)	25 (83.3%)	
Graduation	0 (0%)	25 (100%)	
The educational level of mother			
Illiterate	3(100%)	0 (0%)	0.001*
Primary	13 (7.9%)	35 (92.1%)	
Secondary	1(16.7 %)	40(83.3%)	
Graduation	1 (9%)	35 (90.9%)	
Father's employment			
Not Employed	10(46.1%)	70(53.8%)	0.804
employed	8(42.9%)	40(57.1%)	
Mother's employment			
Not Employed	18 (47.4%)	100 (52.6%)	0.685
employed	0 (0%)	10 (100%)	
Residence			
Urban	14 (16.6%)	70 (84.4%)	0.242
Rural	4 (9%)	40 (91%)	

Parents with prior knowledge of the LP risk were more likely to deny permission (p=0.047). Of the 124(96.9%) inpatients, 110(88.8%) received parental consent for LP (p<0.001) (Table 3).

Discussion

The parental decision regarding LP on their children is affected by multiple factors, including their comprehension of their child's condition and the clinician's ability to convince them of the procedure's necessity[18].

Table-3: Association of parents' knowledge about lumbar puncture (LP) with the family decision regarding the procedure.

Variables	Refused LP (18)	Accepted LP (110)	P-value
Knowledge about the importance of LP			
Know	10 (10.8%)	82 (89.2%)	0.97
Do not know	8 (22.2%)	28 (87.8%)	
How do you know about the risk of LP?			
I do not know	8 (11.1%)	64 (88.9%)	0.04*
From a relative	6 (13%)	40 (87%)	
From friend	4 (40%)	6 (60%)	
Who requested the LP?			
Resident	10 (12.5%)	70 (87.5%)	0.122
Specialist	8 (16.6%)	40 (83.4%)	
Were the patients admitted or discharged?			
Admitted	14 (11.2%)	110 (88.8%)	0.001*
Discharged	4 (100%)	0 (0%)	

The LP refusal rate in the current study was 14%, which is very low compared to the rates reported previously, which were as high as 61%[9,19]. Comparatively low refusal rates were reported by studies done in Singapore and Iraq[6,20], while a study in Turkey reported the lowest LP refusal rate (4.7%)[14].

The low refusal rate in the current study can be attributed to the different geographical location and socio-cultural characteristics of the studied population, as previous studies found that attitudes toward LP varied depending on cultural beliefs and geographical locations6,[14,17].

The current study was conducted at the peak of the second COVID-19 wave in Iraq. Many uncertainties and misbeliefs were surrounding the virus, especially its impact on children. The fear of unknown consequences was a potential reason behind the decreased refusal rate among Iraqi parents, although this point was not addressed in the study questionnaire. A growing body of evidence has documented higher levels of anxiety and panic reactions related to the fear of the COVID-19 infection[4,21].

The most common cause of LP refusal in the current study was fear of paralysis, which agrees with earlier results[11,14,15,17]. The fear of complications from LP was reported as the main reason for refusal in one study,[18] while being surprised by the need for LP was the most common cause of refusal in another study[9].

Neither child age nor gender was significantly associated with LP refusal. This matches earlier results[6,12,17]. On the other hand, as a single predictor for LP refusal, age <1 year and <6 months was cited by studies.[9,15]

The current findings related to gender were in contrast to studies that reported higher refusal rate in cases of male children[9,21], which can be attributed to the sociocultural preference for boys[9].

In the current study, the age of the father did not significantly affect LP decision, but mothers of extreme age had a lower refusal rate. This contradicts the findings that the decision of LP had no significant correlation with maternal age[11]. Other studies also reported that the age of guardians did not affect LP decision [6,16,18].

A higher parental educational level was associated with a lower refusal rate for LP in the current study, which was in line with an earlier study[22], but differed from those reporting no association between parents' educational level and their LP decision[9,11,18]. Another study showed that parents with no formal education consented more readily than those who had received some (primary and secondary) formal education[15].

The employment status of the parents was not significantly associated with LP decision, and the findings was in line with previous studies[6,12,15,16].

In the current study, the knowledge of the parents regarding the importance of LP was not significantly associated with LP refusal, which was also reported earlier[17].

The refusal rate was highest among parents who had prior knowledge about the risk of LP, and the difference was significant (p=0.04). This is in line with earlier reports[10.17]. As mentioned earlier,[17] this factor can be attributed to false information about LP that usually comes from friends or relatives who are not medical personnel.

All the families in the current study, who decided to leave against medical advice (LAMA), did so after refusing LP. A study reported that parents who refused LP were [8.5] times more likely to opt for LAMA[6].

The role of media in the dissemination of correct information and raising public awareness cannot be overestimated. A good example is the COVID-19 pandemic during which vaccine misbeliefs were the main limiting factor in vaccine which was overcome with the help of media messages. Likewise, LP procedure's safety should be addressed via primary healthcare mechanisms and media[23,24].

Limitations: The current study has limitations as it was conducted at a single centre with a small sample size. The sample size was not calculated, which could have affected the power of the study and generalisability of the

findings. Besides, a pilot study was not conducted for the validation of the study questionnaire. Finally, the uncertainties and misbeliefs about COVID-19 infection that seem to have influenced the parental decision regarding LP was not a factor addressed by the current study.

Conclusion

During the active phase of COVID-19, parental refusal for LP in their children was low. Mother's age and parental education had a significant effect on the decision.

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