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Associated Factors of Lumbar Puncture Parental Refusal for Paediatric Patients: A Cross-Sectional Study

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Abstract

Objectives: While lumbar puncture (LP) is often performed and plays a major role in the diagnosis and management of suspected central nervous system (CNS) infections, many parents withhold consent for LP. Refusal to LP results in an unfavourable result. This study aimed to assess the parenteral LP refusal rate and the related factors behind it.

Method: A cross-sectional study was performed to include all paediatric patients suspected of having a CNS infection in the paediatric department of a tertiary hospital between January 2015 and December 2017. Using a questionnaire, their parents were interviewed via phone calls. The data were registered and analysed in Epidata form using SPSS version 16 and Chi-squared testing.

Results: A total of 314 parents, of which 33.1 % declined LP, were included. The most common cause of refusal was fear of complications, primarily paralysis (66.3 %). The study showed that 49 % of parents thought it was unnecessary, 32 % did not know the indications, 14 % did not want to take responsibility for the decision, and 14 % had a lack of faith in obtaining consent. It also revealed, when LP benefits were clarified, 78.1 % of parents approved, compared to 21 % when not explained. Also, when LP disadvantages were clarified, 33.3 % of parents refused, compared with 66.7 % when not explained.

Conclusions: This study revealed that the LP refusal rate is high. A lack of awareness and fear of complications were the key variables of LP parenteral rejection. As a result, the study authors designed LP parents' awareness leaflet to provide consistent guidance and enhanced understanding to physicians and parents.

Keywords: Meningitis; Lumbar Puncture (LP); Cerebrospinal Fluid; Central Nervous System Infections (CNS)

Introduction

Acute meningitis, with a high morbidity and mortality rate for all age groups, is still a severe disease [1]. For both diagnosis and management of CNS infection, a lumbar puncture (LP) is an important and widely performed procedure [2,3]. It enables the early detection of causative pathogens, optimizes the clinical outcome with the use of controlled antimicrobial agents, and decreases hospitalization [4,5]. If LP is done correctly, complications are typically uncommon and mild, such as pain at the site and headache after LP [6]. Previous studies have shown that the LP rejection rate in Kuwait was as high as 80% and in the United States as low as 5% [6]. They also showed that fear of complications and lack of understanding were the key reasons for LP refusal [3,7].

The prevalence of meningitis in Oman was 3 per 100,000 population in 2005 [8]. It has been recorded that 70% of acute meningitis in Oman occurred in children under 13 years of age, most of whom are younger than 2 years of age [9]. To the best of the authors' knowledge, this is the first

local research to establish the rate of rejection of LP and the reasons behind it. It helps to develop a proper intervention to reduce the rate of LP refusal and to improve the attitudes of the public and parents.

Method

This was a cross-sectional descriptive analysis carried out between January 2015 and December 2017. It included all Omani children aged between newborns and 12 years who had been admitted to the paediatric clinic and PICU in the tertiary hospital for whom LP had been indicated and consent had been obtained. Newborns seeking neonatal intensive care admission have been excluded because they only use verbal consent, not written consent.

The sample size was estimated using 5% precision through a single proportion – absolute precision to be an average of 320. The data were obtained from the hospital record system with the aid of the information technology department looking for diagnostics (meningitis, meningoencephalitis, CNS infection, and neonatal sepsis). In addition to other questions, the questionnaire was constructed from previous research to fulfil the study hypothesis. It included questions on the demography of patients (the age, sex, past medical history, and clinical presentation) that were collected from the hospital records. Parents' characteristics were collected through telephone interviews, including educational level, area, and the number of offspring, history of infertility, and history of chronic disease in the family. The study omitted parents who did not respond or who did not have a contact number. There were only 252 parents interviewed. Parents were asked to answer yes or no by phone calls interview for the list of common reasons found in other studies and asked if they would like to add any other reasons. All data were reordered in an Excel sheet data collection form and analysed by the statistical package for social sciences (SPSS) version 16.

The results were reported as frequencies and percentages. To detect whether there is a significant correlation between variables, a Chi-squared test (X2) was used. The P-value < 0.05 was considered important. Ethical approval was obtained from the Ethical Committee of the Tertiary Hospital (MESRC # 92/2016) and verbal informed consent was obtained by the researchers by a phone call from each parent involved in the analysis.

Results

A total of 314 paediatric patients with LP indication were included, most of whom were below the 3-month age range, 249 (79.2%) (Table 1). There was no statistical difference between parental rejection for LP and patient age (p-value =0.29), sex (p-value =0.06), and 210 (66.9 %) parents agreed to consent to LP and 104 (33.1 %) declined (Table 1). Among parents who agreed to do an LP, the most common complaints were fever, lethargy, poor eating, and vomiting (Figure 1). The relation between LP refusal and clinical presentations is not statically important (p-value >0.03). The analysis showed a statistically important association between the level of paternal education and the LP refusal rate, as the LP refusal rate was lower with a higher educational level with the Linear-by-Linear Correlation of 0.004 (Table 2). There was no statistical correlation between the rejection of the LP and the features of other parents, including age, the number of offspring (p-value =0.49), a history of infertility (p-value =0.48), and history of chronic illness in the family (p-value =0.19).

Age	LP agreed	LP refused (%of the total for age)	Total	Percentage of total
0-1 month	120 (66.3)	61 (33.7)	181	57.6
1-3 months	42 (60.0)	28 (40.0)	68	21.6
>3 months	48 (76.2)	15 (23.8)	53	16.8
Total	210 (66.9)	104 (33.1)	314(100)	

Table 1: Lumbar puncture (LP) refusal and age of paediatric patients.

Education level	Mother		Father	
	Agree	Refuse	Agree	Refuse
Literate	2(50%)	2(50%)	0(0%)	1(100%)
Write & read	19(63%)	11(36%)	22(55.4%)	20(47.6%)
2ed school	58(56.3%)	45(43.7%)	59(59.6%)	40(40.4%)
Diploma and above	52(71%)	33(28%)	79(73.1%)	29(26.9%)
Linear-by-Linear Association	0.82		0.004	

Table 2: Association of the refusal of LP and of parental education.

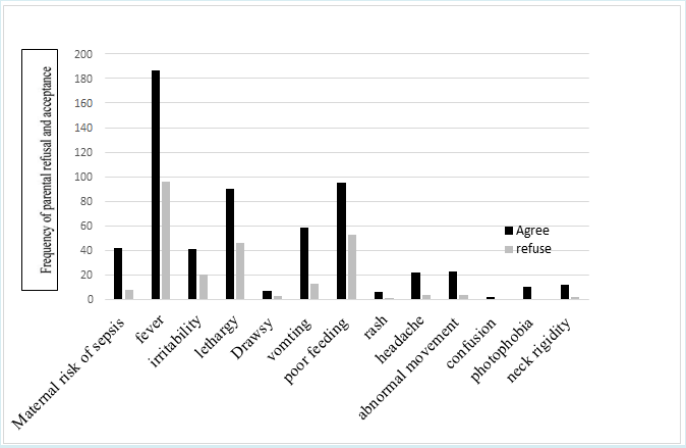

Figure 1: Comparison of LP refusal and agreement based on patients history and complaints.

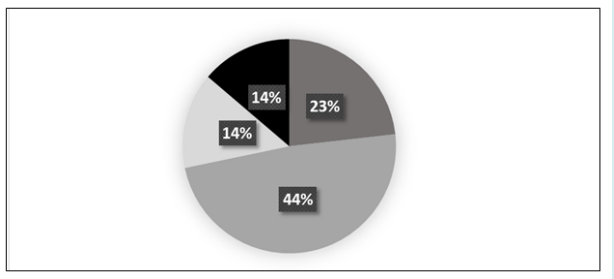

Figure 2: Parents' perception of consent for lumbar puncture (LP) and factors for refusal.

Fear of complications, including paralysis, bleeding, CSF leakage, and a headache was the primary reason for the refusal. 64.3% of parents refused LP because they believed it can paralysis. Another refusal reason was related to the counselling given to the parents to assist them in consenting to LP. The study showed that 49% of the parents thought LP was unnecessary and 32% did not know its actual indication, others summarized in (Figure 2). Each parent interviewed was asked whether the benefits of LP and the disadvantages of not doing LP has been clarified. The answers were checked by stating the advantages and the disadvantages to them and asking them again if they were each parent interviewed was asked if the advantages of the LP and the disadvantages of not doing the LP had been explained.

44% feel that LP is not important. 23% the indication is not understood. 14% do not want to take responsibility for LP and the remaining 14% doubt the reasons behind the consent. The answers were checked by listing the advantages and the disadvantages to them and asking them again if they were familiar or were mentioned to them. The study showed that there was a 31.8% decrease in rejection when the benefits were explained to the parents (Figure 3). Also, when the disadvantages were clarified, there was a 40 % drop in rejection (Figure 4).

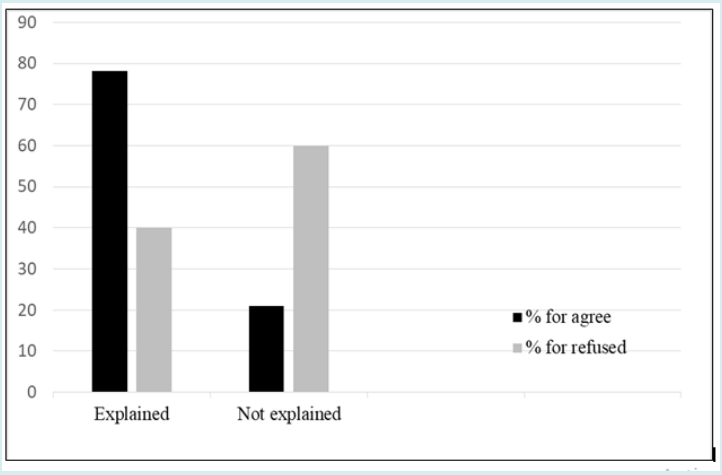

Figure 3: Comparison of the percentage of LP rejection with clarification of the advantages of LP and without clarification.

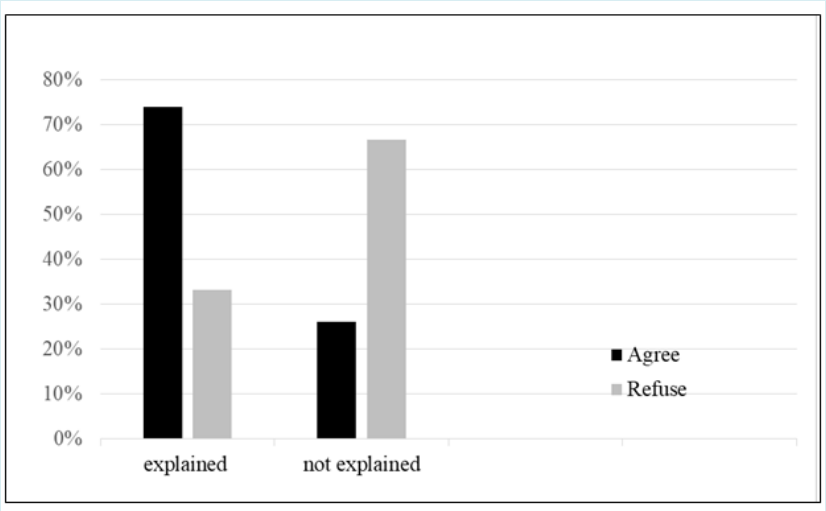

Figure 4: Comparison between LP refusal percentage with explanations of the disadvantages of refusing LP and without explanation.

Discussion

The LP was a commonly performed an important procedure for the diagnosis of suspected CNS infection [3]. Parental refusal to consent is not rare worldwide, considering its effectiveness [3]. Refusal of LP has a greater effect on accurate diagnosis, the use of optimal antibiotics, duration of treatment and hospital stay.

This research aimed to examine the parenteral LP refusal rate and the associated factors behind it. It revealed that 104 (33.1%) parents rejected LP, almost like some of the previous studies that recorded a parental rejection rate of as high as 80% in Kuwait, 61% in Iran, 44% in the UAE, and 5% in the United States [6,9,10] This study showed no association between the age of patients and LP parental refusal, which is different from other studies showing a significant association of rejection, especially less than 6 months of age [11].

This study also found that there is no statically significant association between LP rejection, patient gender and clinical presentation, as in previous studies. [11,7]. The most common symptoms among parents who agreed with the LP were fever, lethargy, poor eating, and vomiting. It also reported that the LP rejection rate was statistically slightly lower with just 28 % higher paternal education compared to 43 % lower education comparable to the Malaysian study [12]. Comparing this with the Pakistan article, which showed a lower parental refusal rate (32.6%) although half of them were uneducated compared to the UAE sample, where the study recorded a refusal rate of 44% although most parents had obtained higher education, this suggests that the refusal to LP is multifactorial [3,11,13,14]. Similarly, this research also revealed concerns of complications, primarily paralysis, and Lack of knowledge of the indication of LP, as well as the advantages and disadvantages of the indication of LP, were the main factors of parental refusal for LP, like previous studies in the UAE and Iran [3,7]. When comparing the percentage of LP refusal among parents who were aware of these advantages and disadvantages, this study found that there was a 31.8% decrease in refusal when benefits were explained to the parents. Also, there was a 40.6% reduction of refusal when the disadvantages were explained.

The findings of the study support the need for effective parental counselling to overcome LP refusal. A public education awareness leaflet was made by the authors of the study to ensure a clear awareness of parents during counselling to minimize the rate of LP rejection. It is available in the tertiary hospital electronic information system, which can be utilized by the paediatrician and provided to the parents. It has also been distributed to our colleagues at other local hospitals.

Conclusion

This is the first local study that confirms a high rate of LP parental refusal. It revealed a lack of awareness and fear of complications was the main factors of refusal. The study findings support the need for effective parental counselling to overcome this issue. The research authors made a public awareness educational leaflet maintain a consistent awareness to the parents during counselling.

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