

Analysis of Parental refusal of Lumbar puncture in children with Febrile Convulsions

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ABSTRACT

Objective: To assess the frequency and different factors leading to parental refusal of lumbar puncture in children with febrile convulsions.

Study Design: Descriptive Cross-sectional study.

Place and Duration: Pediatric Ward of Children Hospital, Pakistan Institute of Medical Sciences, Islamabad for one year from 1st January, 2017 to 1st January, 2018.

Methodology: Parents of children of both genders with first episode of febrile convulsion from 1 month to 12 years age and planned for lumbar puncture were interviewed for their response to lumbar puncture. If parents refused lumbar puncture, then close ended questions were asked regarding fear of paralysis, backache, walking problems, spasticity and death. In addition, parents' demographic details to assess the correlation with different factors responsible for refusal were also assessed.

Results: Among a total ninety-five children admitted and planned for lumbar puncture, 41% parents refused the procedure. The most frequent reason was fear of paralysis (36%) followed by fear of pain (26%), fear of subsequent walking problem (18%), fear of death (15%) and fear of spasticity (5%). Rate of refusal was significantly higher in parents with lower level of education and who had previous knowledge about the procedure ($P < 0.05$).

Conclusion: Poor knowledge of parents about importance of lumbar puncture procedure and its complications lead them to its refusal especially in those who have lower level of education and previous knowledge of this procedure.

Keywords: Children, Febrile convulsions, Febrile seizures, Lumbar puncture, Parent concerns, Refusal to procedure

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INTRODUCTION

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Febrile convulsions (FC) are one of the most common transient neurologic disorders in infants and childhood¹. Approximately 1 to 5% of admissions in Pediatric emergency department are due to FC and affect 2-5% of all young children². Incidence is more in Asian countries and suggested explanation is that infections are more common in this age group in these countries³. The association between seizure and bacterial meningitis is well established. In developing countries like Pakistan 7.6% children with first episode of FC suffer from acute bacterial meningitis⁴. The chances of meningitis are even more (25.87%) in children who present with complex FC. These chances reach up to 50 percent in children below one year of age⁵.

As per American Academy of Pediatrics guidelines, doctors should find out the cause of fever in a child with FC and meningitis should always be kept in differential diagnosis and it should be ruled out by performing Lumbar Puncture (LP) in every sick child and who have signs suggestive of meningitis. In our clinical practice, high number of parents refuse LP to be performed on their children resulting in lack of detection of acute meningitis. The better knowledge of factors responsible for refusal to LP in specific population can help us in better counseling of parents before taking consent of LP which will definitely reduce the rate of LP refusal.

Studies are done in various countries to determine the rate of refusal of LP and its associated factors. A study conducted in UAE revealed LP refusal rate of 44%. Conviction that LP is unnecessary and fear of paralysis comprise of 80% causes for refusal^{16,7}. While LP refusal rate in a study done in Karachi was 32.6%. Literature search did not reveal any such study in Islamabad and nearby provinces in Pakistan.

As there are lot of cultural differences in various parts of the world so results of studies done elsewhere cannot be applied to our population. So this study was conducted with an objective to assess the frequency and different factors leading to parental refusal of lumbar puncture in children with febrile convulsions.

METHODOLOGY

This Descriptive Cross-sectional study was conducted in Pediatric ward of Children Hospital, PIMS from 1st January, 2017 to 1st January, 2018 after seeking permission from research and ethics committee of Pakistan Institute of Medical Sciences (PIMS), Islamabad. Children from 01 month to 12 years of age of either gender presenting with first episode of febrile convulsion were included in this study. Children with afebrile seizures, metabolic seizures and previous episodes of febrile seizures were excluded from the study.

These patients were recruited through non-probability, consecutive sampling and informed consent was obtained from parents for inclusion in the study. The data was collected by conducting interviews of parents of the affected children according to structured questionnaire. To decrease the response bias of parents, these interviews were conducted in Pediatric ward after initiation of treatment of their children to minimize the fear of parents regarding inadequate treatment by treating physician after Lumbar Puncture refusal.

Interviews were conducted in Urdu language. 1st author conducted all the interviews to ensure uniformity in questions asked or clarification sought. No audio or video recordings were done because this may not be acceptable by the local culture. The questionnaire covered demographic details of the children and their parents. It also covered educational status, previous knowledge of LP and response to LP of parents. If parents refused LP then close ended questions were asked regarding fear of paralysis, backache, walking problems, spasticity and death to determine which factors were responsible for it.

Data Analysis: The data was entered and analyzed using SPSS version 20. Mean $\pm$ SD was calculated for age of the patients. Frequencies and percentages were calculated for qualitative variables like gender of the children, education and previous knowledge of parents about LP and factors responsible for LP refusal. Effect modifiers like age and gender of children and educational level and previous knowledge of LP of parents were stratified. Post stratification chi-square test was applied. P-value ≤ 0.05 was considered significant.

RESULTS

A total of 95 children were enrolled, among them 55 (58%) were

male and 40 (42%) were female with a mean age of 4.6 ± 2.9 years. The male-to-female ratio was 1.38:1. LP was refused in 39 (41%) children. Regarding educational status of parents 23(24%) have primary, 56 (59%) have secondary and 16(17%) have higher education. Only 27(28%) parents have previous knowledge of LP. The most frequent reason of LP refusal was fear of paralysis followed by fear of pain, fear of subsequent walking problem, fear of death and fear of spasticity as shown in Table-I.

Table-I: Factors Responsible for LP Refusal (N= 95)

Factors	n (%)
Fear of Paralysis	14(36%)
Fear of Backache	10(26%)
Fear of Walking Problems	7(18%)
Fear of Death	6(15%)
Fear of Spasticity	2(5%)
Total	39(100%)

Stratification with respect to age and gender did not show any significant difference ($P > 0.05$). However, rate of refusal was significantly higher in parents with lower level of education and who had previous knowledge about the procedure ($P < 0.05$) as shown in Table-II.

Table-II: Comparison of LP Refusal with children's age groups, gender, parent's education and previous knowledge of LP (N=95)

Variables		LP Refusal		Total	p-Value Chi-Square
		Yes (%)	No (%)		
Age Groups	≤ 5 years	25 (42%)	34 (58%)	59 (62.1%)	0.738
	6-12 years	14 (39%)	22 (61%)	36 (37.9%)	
Gender	Males	26 (47%)	29 (53%)	55 (57.9%)	0.148
	Females	13 (32%)	27 (68%)	40 (42.1%)	
Parents' Education	Primary	13 (56%)	10 (44%)	23 (24.2%)	0.021
	Secondary	24 (43%)	32 (57%)	56 (58.9%)	
	Higher	2 (12%)	14 (88%)	16 (16.9%)	
Previous Knowledge of Parents	Present	16 (59%)	11 (41%)	27 (28.4%)	0.023
	Absent	23(34%)	45(66%)	68 (71.6%)	

DISCUSSION

FC are the most common cause of convulsions in children. Its pathophysiology remains unclear but genetics plays a major role in conferring susceptibility⁸. Although most FC are benign and associated with various viral, bacterial and parasitic infections, it is critical that the child should be evaluated immediately to reduce parental anxiety and to identify the cause of the fever⁴. It is essential to exclude underlying meningitis either clinically or if any doubt remains by lumbar puncture⁸. The American Academy of Pediatrics published a practice guideline recommending that LP be strongly considered in unimmunized infants and children who are pretreated with antibiotics who present with FC⁹.

Despite this, LP refusal is universal problem with varying rate of refusal in different parts of the world. In our study LP refusal rate in children was 41%. This is comparable to the rates of studies

done in Saudi Arab (44.3%) and United Arab Emirates (44%) but higher than rates of studies conducted in Karachi (32.6%), Malaysia (25%) and Turkey (4.7%)^{7,10-13}. It is lower than rate of study conducted in Iraq (61%)¹⁴.

Similarly under lying factors of refusal to LP also vary in different parts of the world. In our study, the most frequent reason of LP refusal was fear of paralysis followed by fear of pain, fear of subsequent walking problem, fear of death and fear of spasticity. Narchi et al. and Ahmed et al. in their studies found that fear of complications is the major factor responsible for refusal to LP followed by parent's perception that LP is not necessary^{6,11}. Ali Khakshour et al. found that low back pain is the most important fear of LP refusal in children¹⁵. Some studies also found the fear of infertility as one of the cause of LP refusal^{11,13,16}.

In our study, age and gender of children did not have significant association with LP refusal. This is similar to findings of Ling SG et al. who also did not find any significant association between LP refusal and age and gender of children¹². While Ahmed et al. found that LP refusal was less in children younger than 6 months of age which is in contrast to our study¹¹. Naji et al. also found LP refusal is higher in male children than in female children¹⁴. This may be due to the fact that parents are more afraid of taking risk of LP in younger and male children as compare to older and female children.

In our study, rate of refusal was significantly higher in parents with lower level of education and who had previous knowledge about the procedure. This is similar to the finding of study done in Kuwait¹⁶. Narchi et al. found no association between LP refusal and education level of parents which differs from our study⁶. The reason of high rate of refusal among those parents who had previous knowledge of LP might be that they got wrong information from friends and relative instead of doctors.

Mufleh et al and Ling et al. found that parents who refused LP were significantly more likely to get their children discharge from hospital. This would put them more at risk of complications of meningitis due to lack of diagnosis and treatment^{10,12}.

Narchi et al. found no LP related complications in any of the 31 children who underwent the procedure⁷. Literature search revealed no such complication like paralysis due to LP. Only minor dysesthesia can occur due to slight nerve damage. The success rate can be increased by ultrasound guided lumbar punctures which are increasingly common now a days especially in infants and in patients with difficult anatomy of vertebral column^{17,18}.

In order to decrease the rate of refusal to LP, parents should be counseled that these complications are not due to LP but due to meningitis which is fatal disease if not treated properly. Inadequate treatment of meningitis can lead to various complications like permanent paralysis, mental retardation as well as damage to cranial nerves, hearing, vision and speech⁶.

So LP is extremely necessary to diagnose or rule out meningitis. The benefit of ruling out meningitis will be that the hospital stay of children will be short and they will be discharged safely on oral medicines. As a result, treatment will be less expensive⁷. Parents should also be assured that most experienced doctor available will do this procedure and if needed under ultrasound guidance.

Parents should be given time to think for 1 to 2 hours during which they can consult other people or health care professionals for expert opinion¹⁶. During this period, the condition of the child can be observed which will make decision of LP easy for the parents and refusal will decrease significantly¹⁹.

CONCLUSION

Poor knowledge of parents about importance of LP procedure and its complications lead them to its refusal especially in those who have lower level of education and previous knowledge of this procedure.

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AUTHOR'S CONTRIBUTION

Anwar A: Conceived idea, Designed methodology, Manuscript writing, Data collection

Khan IM: Literature review, Data analysis, Data interpretation, Manuscript writing

Sherazi SH: Data analysis, Data interpretation, Manuscript writing

Yasmeen N: Literature review, Literature search

Ashfaq MW: Data analysis, Data interpretation, Manuscript writing

Shah A: Data collection

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