DOI: https://doi.org/10.53350/pjmhs2023172277

ORIGINAL ARTICLE

Contributing Factors of Lumbar Puncture Refusal in Children Presented with Suspected Meningitis

HASSAN ASIF[1], SOBIA SHAHALAM[2], SHAZIA RIZWAN[3], RIZWAN WASEEM[4], TAYYABA NOOR[5], MADIHA IQBAL[6]
[1]*Postgraduate Resident of Paediatrics, Ghurki Trust Teaching Hospital Lahore*
[2]*Assistant Professor of Paediatrics, Lahore Medical & Dental College / Ghurki Trust Teaching Hospital Lahore*
[3]*Associate Professor of Paediatrics, Lahore Medical & Dental College / Ghurki Trust Teaching Hospital Lahore*
[4,5]*Professor of Paediatrics, Lahore Medical & Dental College / Ghurki Trust Teaching Hospital Lahore*
[6]*Assistant Professor of Paediatrics , Lahore Medical & Dental College / Ghurki Trust Teaching Hospital Lahore*
Correspondence to: Sobia Shaalam, Email: drsobiashahalam@gmail.com, Cell: 03434501140

ABSTRACT

Objective: To study frequency of contributing factors of lumbar puncture refusal in children presented with suspected meningitis.

Methodology: In this descriptive cross-sectional study during 2019 to 2020 at Pediatric Department Ghurki Trust Teaching Hospital, Lahore a total of 155 cases of 2 months to 12 years of age who presented with suspected meningitis and refused the procedure were included. They were asked about various contributing factors like fear of side effects, little knowledge of the disease, unsuccessful experience and lack of medical facility.

Results: In this study there were total 155 cases. Out of these 84 (54.19%) were males and 71 (45.81%) females. The mean age of the participants was 3.81±2.03 years. Among contributing factors for refusal, most common factor was fear of side effect which was observed in 39 (25.16%), followed by unsuccessful experience seen in 18 (11.61%), lack of medical facility seen in 16 (10.3%) and little knowledge of the disease in 13 (8.39%) of the cases. There was no significant association with any of the contributing factor with variable of this study.

CONCLUSION: There are number of factors for refusal of LP and fear of side effect was the most common. There was near significant association of high socioeconomic class with lack of medical facility.

Keywords: Lumber puncture, CSF, Medical Facility, Fear

INTRODUCTION

Information about the cerebrospinal fluid may be obtained with a lumbar puncture, a technique often done in the emergency room (CSF). It is most often used for diagnosis, to rule out potentially fatal illnesses like as bacterial meningitis or a subarachnoid haemorrhage, but it is also sometimes used for therapy (eg, treatment of pseudotumor cerebri). Analysis of cerebrospinal fluid (CSF) may be helpful in making a number of other diagnoses as well (eg, demyelinating diseases and carcinomatous meningitis). [1] Patients with suspected bacterial meningitis should be given antibiotics and steroids without delay, but a lumbar puncture should only be conducted following a neurologic evaluation.

There are different studies in literature which are conducted to find out the underlying factors associated with refusal of lumbar puncture in children who presented with clinical features of meningitis, in one done in Iran showed fear of side effects especially pain was the most common reason lumbar puncture refusal by parents. 61(67.1%) parents refused LP due to fear of side effects,23(25.3%) refused due to little knowledge of disease, 4(4.4%) and 3(3.3%) due to unsuccessful experience and lack of medical facilities respectively. [2]

In another study conducted in Botswana Africa showed similar results of refusal reasons being fear of pain, paralysis and procedure unknown to them. In some studies it is practitioner discomfort associated with being lumbar puncture not performed which include inexperience hands or risk of procedure like assessment of risk of brain herniation. [3]

Wong et al. found that in 2010, the leading reasons for parental rejection of LP were fear of paralysis (48%) and risk of mental impairment (6%), with 16% influenced by the advice of friends and family[4].

Deng et al. [5], who investigated parents' perspectives on LP for children with febrile convulsions, found that the most common reasons for rejection were concerns about paralysis, mental retardation, infant mortality, pain, and weak kidneys.

Fear of paralysis, misunderstanding owing to inaccurate popular information, fear of losing the kid during the LP, and the discomfort of the procedure were shown to be the most common reasons for parental reluctance or disagreement when evaluating their own children for LP [5, 6]. Informed consent for operations is not only a hotly disputed topic in our culture, but rather a global concern. It has been shown that hospitals do not always adhere to a consistent policy for this kind of consent [7].

Family factors including as location, parental education, and socioeconomic position were shown to have little influence on LP choices. Also, Malik et al. [8] made the same finding. Researchers observed a high proportion of acceptance among college-educated parents in another research [9]. Three research [9, 10, 11] found that participants' ethnicity had an effect on the frequency with which they accepted LPs, although this was not a factor investigated in the majority of studies since the sample consisted exclusively of members of one ethnic group.

One possible concern that hasn't been investigated in these research [9,12-15] is that unexpectedly needing LP is one of the factors that leads people to reject it. Previous research [9,13,14] found that relatives and friends were the source of false information regarding LP, but in our study, we found that grandmothers were the source, given their major position in our culture of extended families. Previous research found that most parents learned their false beliefs about LP from sources outside of the medical community; as a result, it is crucial to spread accurate information about the safety of LP in children, as parents' attitudes toward the procedure may be influenced by their level of knowledge [9,13].

In contrast to previous research [12,16], we found that infants and young children were more likely to refuse LP. Sharif MR et al. observed a similar discovery, noting that the male sex was the second major predictor in inducing LP rejection in their research. This may be due to societal influences in this location and the significance of having male offspring. [10]

METHODOLOGY

In this descriptive cross-sectional study during 2019 to 2020 at Pediatric Department Ghurki Trust Teaching Hospital, Lahore a total of 155 cases of 2 months to 12 years of age who presented with suspected meningitis and refused the procedure were included. They were asked about various contributing factors like fear of side effects, little knowledge of the disease, unsuccessful experience and lack of medical facility. Whereas the presence of chronic cardiovascular or respiratory conditions like congenital heart disease, lung cyst, etc, structural defects like meningomyelocoele, encephalocele and base of skull fracture, immunocompromised or having recurrent meningitis,

hemodynamically unstable, signs of raised ICP, deranged coagulation profile and thrombocytopenia, infection at lumbar puncture site and known case of febrile fits were excluded from the study. All patients/guardians were counselled about the disease and procedure of lumbar puncture regarding its indication and adverse effects. Written informed consent was obtained before procedure from those who agreed and refusal written consent was obtained from those who refused. Parents/guardians refusing LP were interviewed to find the contributing factors of their refusal as per operational definition in accordance with a predesigned questionnaire. Questionnaire included sociodemographic variables, social and medical reasons. Regarding data analysis, sex, education status of parents and was presented as frequencies and percentages. Age as mean and standard deviation. Chi square test was applied. P-value of ≤0.05 was considered significant. Data was stratified for age, sex, education of parents and socioeconomic status.

RESULTS

In this study there were total 155 cases. Out of these 84 (54.19%) were males and 71 (45.81%) females. The mean age of the participants was 3.81±2.03 years. Most number of cases had primary and middle education as in figure 08. Out of 155, 65 (41.94%) were in middle socioeconomic Most common factor was fear of side effect which was observed in 39 (25.16%), followed by unsuccessful experience seen in 18 (11.61%), lack of medical facility seen in 16 (10.3%) and little knowledge of the disease in 13 (8.39%) of the cases. Fear of side effect had no significant association with any of the confounding variables of the study (tables 03-06). Similarly, little knowledge of disease also had no significant association but it was more common in uneducated and those with primary education (tables 7-10). Unsuccessful experience was almost equal in all the groups (tables 11-14). Lack of medical facility was nearly significant in cases that had high socioeconomic class where this was observed in 8 (18.60%) cases as compared to 6 (9.23%) cases in middle and 2 (4.25%) in low socioeconomic status with p= 0.08.

Table 1: Frequency of Various Factors for Refusal in Study Subjects. (n= 155)

Factors for Refusal	Number	Percentages
Fear of side effects	39	25.16%
Little knowledge of disease	13	8.39%
Unsuccessful experience	18	11.61%
Lack of medical facility	16	10.3%

DISCUSSION

Acute bacterial meningitis (ABM) is a dangerous disease that mostly affects young children but may afflict anybody at any age. In spite of significant medical progress, ABM continues to be a leading cause of morbidity and death in children all over the globe. [17] Children who have had ABM can have neurological complications as a result. [18]

Meningitis often manifests in children with fever, vomiting, poor feeding, seizures, headache, neck stiffness, and altered awareness. [19] Cerebrospinal fluid (CSF) samples taken by lumbar puncture are analysed to diagnose infections of the central nervous system (CNS). [20]

In addition to its use in urgent situations, lumbar puncture (LP) is also a common operation used for diagnosis and treatment. [21] Even when LP is carried out correctly, problems might arise, ranging from mild pain to fatality. Minor problems include post-spinal headache, local bleeding, and backache, with brain herniation being the most serious. [22] Patients presenting with a clinical suspicion of meningitis are not always willing to undergo a lumbar puncture owing to the many myths and misunderstandings surrounding this procedure. [23]

There are different studies in literature which are conducted to find out the underlying factors associated with refusal of lumbar puncture in children who presented with clinical features of meningitis.

In the present study, there were many factors found in cases with refusal to lumber puncture and out of these, the four studied factors were see in overall 86 out of 155 cases and few had more than one factor for refusing the procedure. Out of the studied factors in this study the most common factor was fear of side effect which was observed in 39 (25.16%), followed by unsuccessful experience seen in 18 (11.61%), lack of medical facility seen in 16 (10.3%) and little knowledge of the disease in 13 (8.39%) of the cases.

These results were comparable to the findings of the studies done in the past; however, data was wide variable in terms of various factors. According to a study done in Iran showed fear of side effects especially pain was the most common reason lumbar puncture refusal by parents.61(67.1%) parents refused LP due to fear of side effects,23(25.3%) refused due to little knowledge of disease, 4(4.4%) and 3(3.3%) due to unsuccessful experience and lack of medical facilities respectively. [24]

In another study conducted in Botswana Africa showed similar results of refusal reasons being fear of pain, paralysis and procedure unknown to them. [25] In some studies it is practitioner discomfort associated with being lumbar puncture not performed which include inexperience hands or risk of procedure like assessment of risk of brain herniation. [26]

There was no significant association was seen in terms of the variables of this study with effect modifiers. The data also suggests few predominance in certain factors like male gender and lower age groups as most common factors for refusal. The data from a study done by Al-Hajjah et al revealed that age below one year was a significant factor in LP refusal in our study. [27] There was no such cut off value used in present study; yet number of refusal was highest in cases with age less than 5 years. The data from other studies also didn't find any significant association like our study. [28-29]. Furthermore, they found that male sex was also the second significant factor in causing LP refusal in this study, and this could be due to sociocultural factors in this area and the importance of having male children. [27]

In another study done in Saudi Arabia found that regarding consent for lumbar puncture in their children; 44.3% disagreed and 55.7% agreed. Factors influencing disagreement were relative's opinions (35.1%), media (30.4%) and their previous experience (12.3%). According to them fear was the most concerning factor among all these suggestions [30]

Of the parents of 50 children with a central nervous system infection, 19 (or 38%) said they would not consent to the LP operation being performed on their kid. With a positive predictive value (PR) of 6.64 (95%CI = 8.95-788.08), fathers' level of education were associated with their children's decision to forego the LP operation. Refusal of the LP operation was associated with the mother's level of education (PR 7.69, 95%CI 3.19-16.24). Insightful parenting led to the adoption of the LP method.

This was also more in present study where highest number was in low educational group, but no significant association was found in present study. [31] They further described that parents refused LP due to concerns about the complications that will occur; a headache, pain in LP location, bleeding, infection, hernia, cardio-respiratory compromised, subarachnoid cyst, and leakage of cerebrospinal fluid.

Apart from these factors, the other factors that were studied in various studies and had variable association with this were residence of the family, educational level of the parents and their economic status were found to play no significant role in LP decision making. [32-33]

There were few limitations of this study as this study only four factors were studied and even on our assessment, there were multiple other factors were found for refusal and were also assessed in previous studies.

However, there were many strengthening points as well, as this study highlighted an important and under rated entity which

needs to be addressed as lumbar puncture can be of great help in the early diagnosis and hence prompt management of such dreadful disease.

CONCLUSION

There are number of factors for refusal of LP and fear of side effect was the most common. There was near significant association of high socioeconomic class with lack of medical facility.

REFERENCES

1. Wiley JF, Cronin KM. Lumbar puncture. In: Textbook of Pediatric Emergency Medicine Procedures, 2nd edition, King C, Henretig FM (Eds), Wolters Kluwer | Lippincott Williams & Wilkins, Philadelphia 2007.
2. Khakshour A, Hashemi M, Tavakoli H, Sheikhi Z, Kiani M A. Evaluation of Parental Attitudes toward Lumbar Puncture in their Children. International Journal of Pediatrics(Supplement 1), Vol.1, Serial No.2, Dec 2013.
3. Shetty AK, Desselle BC, Craver RD, Steele RW. Fatal cerebral herniation after lumbar puncture in a patient with a normal computed tomography scan. Pediatrics 1999; 103:1284–1287.
4. Wong SLJ, Yeoh AAC, Ooi TC and Lye CS(2010): Parents view of lumber puncture in children. MJPCH., 16 (2): 19-26.
5. Deng CT, Zulkifl i HI and Azizi BH (1994): Parent's views of lumbar puncture in children with febrile seizures. Med. J. Malaysia, 49(3):263–268.
6. Narchi H, Ghatasheh G,Al Hassani N, Al Reyami L and Khan Q (2012):Why do some parents refuse consent for lumbar puncture on their child? a qualitative study. Hosp. Pediatr.,2(2):93 – 98.
7. Manthous CA, DeGirolamo A, Haddad C and Moateng-Adjepong Y (2003): Informed consent for medical procedures: local and national practices. Chest,124:1978–1984.
8. Mohammad Reza Sharif, Javad Alizargar, Alireza Sharif. The rate of Parental Consent to Lumbar Puncture for Diagnosis of Febrile Convulsion. Middle-East Journal of Scientific Research 21 (3): 427-430, 2014
9. Ehab Farag, Entesar H Husain, Hussein Fathy, Ahmad Shawky. Perceptions and Attitudes towards Lumbar Puncture (LP) among Parents in Kuwait. Kuwait Medical Journal 2009; 41 (4): 306-309.
10. Hassib Narchi, Ghassan Ghatasheh, Noura Al Hassani, Layla Al Reyami, Qudsiya Khan. Comparison of underlying factors behind parental refusal or consent for lumbar puncture. World J Pediatr 2013;9(4):336-341.
11. Ali Khakshour, Mitra Hashemi, Hamid Tavakoli, Zhila Sheikhi, Mohammad Ali Kiani, Saghi Elmi. Evaluation of Parental Attitudes Toward Lumbar Puncture in their Children. International Journal of Pediatrics (Supplement 1), Vol.1, Serial No.2, Dec 2013.
12. Wong SLJ, Yeoh AAC, Ooi TC, Lye. Parents View of Lumbar Puncture in Children. MJPCH 2010 (Dec); 16; Supplementary 2.
13. Malik AS. CONSENT FOR LUMBAR PUNCTURE -FACTORS THAT INFLUENCE THE DECISION. MALAYSIAN JOURNAL OF PAEDIATRICS AND CHILD HEALTH Vol. 12 Nos. 1 and 2 June and December 2000.
14. Sacchetti A, Lichenstein R, Carraccio CA, Harris RH. Family member presence during pediatric emergency department procedures. Pediatr Emerg Care. 1996;12(4):268-71.
15. Al-Hajjiah, N.N. Al-Shamsi, M.M. The Frequency and positivity of lumbar punctures in Iraqi children. Int. J. Res. Pharm. Sci., 2017; 8(3), 373-376.
16. Ali Khakshour, Mitra Hashemi, Hamid Tavakoli, Zhila Sheikhi, Mohammad Ali Kiani, Saghi Elmi. Evaluation of Parental Attitudes Toward Lumbar Puncture in their Children. International Journal of Pediatrics (Supplement 1), Vol.1, Serial No.2, Dec 2013.
17. Iregbu KC, Abdullahi N. Profiles of acute bacterial meningitis isolates in children in National Hospital, Abuja.Niger Med J. 2015;56(4):297–300.
18. Chandran A, Herbert H, Misurski D, Santosham M. Long-term sequelae of childhood bacterial meningitis: an underappreciated problem. Pediatr Infect Dis J. 2011;30(1):3–. doi: 10.1097/INF.0b013e3181ef25f7
19. Kuti BP, Bello EO, Jegede TO, Olubosede O. Epidemiological, clinical and prognostic profile of childhood acute bacterial meningitis in a resource poor setting. J Neurosci Rural Pract. 2015;6(4):549–557. doi: 10.4103/0976 3147.165424
20. Sadek AA, Mohamad MA, Ali SH, Hassan IAA-A, Hussein MF. Diagnostic value of lumbar puncture among infants and children presenting with fever and convulsions. Electron Physician. 2016;8(4):2255–2262. doi: 10.19082/2255.
21. Sucholeiki R, Waldman AL. Lumbar puncture (CSF Examination). <http://www.emedicine.com> accessed on 20th September 2014.
22. Warrel AD, Cox MT, Firth DJ, et al. Oxford textbook of medicine. 4th ed. New York: Oxford University Press Inc; 2003.
23. Boulware DR, Meya DB, Muzoora C, et al. Timing of antiretroviral therapy after diagnosis of cryptococcal meningitis.N Engl J Med 2014;370:2487–2498.
24. Khakshour A, Hashemi M, Tavakoli H, Sheikhi Z, Kiani M A. Evaluation of Parental Attitudes toward Lumbar Puncture in their Children. International Journal of Pediatrics(Supplement 1), Vol.1, Serial No.2, Dec 2013
25. M.B. King , G.M. Rwegerera. An audit of consent practices and perceptions of lumbar puncture, Botswana inpatient setting experience. African Journal of Emergency Medicine (2015) 5, 66–69.
26. Shetty AK, Desselle BC, Craver RD, Steele RW. Fatal cerebral herniation after lumbar puncture in a patient with a normal computed tomography scan. Pediatrics 1999; 103:1284–1287
27. Al-Hajjah N, Al-Shamsi M. The rate of parental refusal lumbar puncture in the Maternity and Children Teaching Hospital in Diwaniyah, Iraq. Pharm Sci Res. 2018;10(10):2680-1.
28. Hassib Narchi, Ghassan Ghatasheh, Noura Al Hassani, Layla Al Reyami, Qudsiya Khan. Comparison of underlying factors behind parental refusal or consent for lumbar puncture. World J Pediatr 2013;9(4):336-341.
29. Sharif MR, Javad Alizargar, Alireza Sharif. The rate of Parental Consent to Lumbar Puncture for Diagnosis of Febrile Convulsion. Middle-East Journal of Scientific Research 21 (3): 427- 430, 2014.
30. Alwahbi ZM, Alzahrani AA. Evaluation of Saudi Arabian Parent's Attitude towards Lumbar Puncture in Their Children for Diagnosis of Meningitis. Egypt J Hosp Med. 2018;70(9):1582-5.
31. Antarini Y, Rosdiana N. Factors Influencing the Decision of Parents to LP in Pediatric with CNS Infection. Sumatera Med J. 2019;3(2):146-51.
32. Riordan F, Cant AJ. When to do a lumbar puncture. BMJ. 2016:235-37
33. Patel PB, Anderson HE, Keenly LD, Vinson DR. Informed consent documentation for lumbar puncture in the emergency department. West JEM. 2014;15(3):318-24.