

# Lumbar Puncture Refusal in Febrile Convulsion

S G Ling, C C M Boey

## ABSTRACT

**A descriptive study was carried out on patients admitted for febrile convulsion over a two-year period to determine rate of lumbar puncture (LP) refusal, factors associated with LP refusal and outcome of such patients.**

**From 77 patients indicated and requested for LP, 19 (25%) patients refused the procedure. Refusal of LP was significantly more common among the Malay ethnic group ( $p=0.01$ ) but not significantly associated with age, gender or whether the patient was admitted for a first or recurrent febrile convulsion. Half of the patients who refused LP had to be started empirically on antibiotics for meningitis. Patients who refused LP were also 8.5 times more likely to discharge themselves “at own risk” (AOR), compared to other patients with febrile convulsion ( $p=0.004$ ).**

**In conclusion, LP refusal is a common problem in the local setting and is a hindrance to the proper management of patients with fever and seizure. Appropriate measures must be carried out to educate the public, particularly those from the Malay ethnic group on the safety and usefulness of the procedure. Reasons for patients discharging AOR following LP refusal also need to be addressed and problems rectified.**

**Keywords: discharge against medical advice, febrile seizure, meningitis, parents, spinal tap.**

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## INTRODUCTION

Febrile convulsion is a condition commonly seen in about 2 - 5% of the population<sup>(1,2)</sup>. Parents of children with febrile convulsion can usually be reassured of the benign nature of the condition<sup>(3)</sup>. However, the main concern of the doctor faced with a child presenting with apparent febrile convulsion would be to determine whether there is presence of meningitis. Lumbar puncture (LP) remains an important investigation to confirm or rule out meningitis in such patients.

In our clinical practice, we seem to encounter quite a high number of parents who refused to give consent for LP to be performed in their child. Our community is made up of three main ethnic groups, namely the Malays, Chinese and Indians. Each ethnic group has their own unique socio-cultural beliefs about LP and this could be a strong influence on their decision whether to agree or refuse LP.

This study was carried out to determine the extent of the problem related to LP refusal in patients with febrile convulsion, factors associated with LP refusal and problems that arose as a result of LP refusal.

## MATERIALS AND METHODS

The medical records of all patients with a final diagnosis of febrile convulsion over a two-year period were retrieved and analysed. Febrile convulsion is defined as a seizure that occurs in childhood after age one month, associated with a febrile illness not caused by an infection of the central nervous system, without previous neonatal seizures or previous unprovoked seizures and not meeting the criteria for other acute symptomatic seizures<sup>(4)</sup>. Patients who were eventually diagnosed as febrile convulsion but the possibility of meningitis not ruled out, due to LP refusal was also included in the study.

Patients from whom LP was indicated and requested were identified. The response of the parents towards the LP request was classified as whether they agreed or refused the procedure. Those who refused LP were easily identified from a refusal form signed by the parents.

The outcome on discharge for all the patients admitted for febrile convulsion was determined and classified as “discharged well”, “discharged with neurological complications” and “discharged at own risk” (discharged AOR).

Statistical analysis using the chi-square test and fisher’s exact test where appropriate (with significance level at 0.05), together with rate ratio (with 95% confidence interval) was used to determine factors related to LP refusal and whether refusal of LP was significantly associated with adverse outcome.

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**Table I. Indications for lumbar puncture in patients with febrile convulsion.**

Indication*	Number of patients
Multiple seizure	36
Young age (<12 months)	17
Neurological abnormalities	9
Prolonged Seizure	8
Drowsiness	7
Irritability	4
Neck stiffness	2
Persistent/High temperature	2
Bulging fontanelle	1
Unknown	6

\* Some patients have more than one indication for lumbar puncture

**Table II. Analysis of factors associated with lumbar puncture refusal.**

Variable	No. of children Indicated for Lumbar Puncture	No. refused Lumbar Puncture	$\chi^2$	p
<b>Age</b>				
<= 12 months	42	12	0.755	0.4
> 12 months	35	7		
<b>Malay</b>				
Yes	42	15	6.058	0.01*
No	35	4		
<b>Sex</b>				
Male	49	9	2.885	0.09
Female	28	10		
<b>First Febrile Convulsion</b>				
Yes	69	15	3.080	0.08
No	8	4		

\* Fisher's exact test

## RESULTS

A total of 448 patients were admitted for febrile convulsion over the two years. The mean age at admission was 19.8 months with a median of 17 months while the male to female ratio was 1.4:1. 40% of patients had complex febrile convulsion, characterized by one or more of the following: focal seizure, duration of more than 15 minutes or more than one episode of seizure within 24 hours<sup>(1)</sup>. None of the patients had any neurological deficit on discharge. 430 (96%) patients were discharged home well, one was transferred to another hospital on patient's request while 17 (3.8%) discharged themselves against medical advice or "at own risk"(AOR).

LP was indicated and requested from 77 (17.2%) patients. The indications for LP are as summarised in Table I. Out of the 77 patients, only 58 consented to a LP

while the remaining 19 patients refused. This gave a refusal rate of 24.7%.

From the 19 patients who refused LP, 8 patients were treated empirically as meningitis, using ceftriaxone, cefotaxime or ampicillin plus chloramphenicol. 7 patients were put on close observation out of whom 3 of them were continued on their existing antibiotic therapy. All these 15 patients were subsequently discharged home well. The remaining 4 patients (20%) discharged themselves AOR following LP refusal. The final outcome of these patients was not known.

On statistical analysis of potential factors associated with LP refusal, only the Malay ethnic group was found to have significant association ( $p=0.01$ ). LP refusal was however not found to be significantly related to age, gender or whether the patient was admitted for a first or recurrent febrile convulsion: This is as shown in Table II.

Cross-tabulation was also carried out to determine factors associated with patients discharging AOR. Factors significantly associated with discharge AOR were parental refusal for LP ( $p=0.004$ ) and patient's age of 12 months or less ( $p<0.05$ ). These are summarised in Table III. However, on multivariate analysis, only parental refusal for LP remained significantly associated with discharge AOR ( $p=0.004$ ). Patients discharging AOR was not significantly related to gender, ethnic group or conscious level of child at presentation, neither was it associated with doctor's request for LP or whether the child was admitted for a first or recurrent febrile convulsion. Patients who refused LP were 8.5 times more likely to discharge themselves AOR compared to other patients with febrile convulsion.

## DISCUSSION

LP refusal has been thought to be a possible hindrance to the detection of intracranial infection in Malaysia<sup>(5)</sup>. This study confirms the high incidence of LP refusal in our local setting. However, scant data is available from other countries regarding LP refusal. In a study from the United States on Lyme's disease, only 1 out of 20 (5%) patients refused LP<sup>(6)</sup>. Another Danish study on isolated optic neuritis showed that 5 out of 68 (7%) patients refused LP<sup>(7)</sup>. These figures are far lower compared to that found in this present study.

In this present study, the Malay ethnic group was more likely to refuse LP compared to other ethnic groups. This may be a result of their cultural beliefs that caused them to fear and refuse the said procedure. Further studies need to be done to determine the role of cultural beliefs in influencing the decisions of parents whether to agree or refuse a LP in their child.

When a child presenting with apparent febrile convulsion is suspected to have meningitis, and the parents refused LP, the doctor is put in a very difficult position. A firm diagnosis of meningitis cannot be made without a cerebrospinal fluid sample.

**Table III. Analysis of risk factors associated with patients discharging “at own risk”(AOR).**

Analysed risk factor	No. of Patients	Discharge AOR	Rate ratio (95% CI)	p value
<b>Conscious level †</b>				
Alert	354	13	0.8 (0.2-3.0)	0.79
Drowsy	69	3		
<b>Doctor's request for lumbar puncture</b>				
Yes	77	5	2.1 (0.7-6.0)	0.17
No	371	12		
<b>Refused Lumbar puncture</b>				
Yes	19	4	8.5 (2.5-29.3)	0.004*
No	429	13		
<b>Previous Febrile Convulsion</b>				
Yes	69	3	0.8 (0.2-3.0)	0.79
No	379	14		
<b>Sex</b>				
Male	273	9	0.7 (0.2-1.9)	0.49
Female	175	8		
<b>Ethnic group ‡</b>				
Malay	240	12		
Chinese	86	4	–	>0.1
Indian	107	1		
<b>Age</b>				
<=12 months	134	9	2.8 (1.0-7.3)	0.04*
>12 months	314	8		

\* Fisher's exact test

† Data was available for only 423 children

‡ 15 patients were from other minority ethnic group

In such situations, other indirect investigation methods can be employed. A blood culture may be helpful but the yield is not high enough and results are not immediately available. Urine latex agglutination can be utilised, providing prompt results. While the test is useful in detecting *Haemophilus influenzae* bantigen, it is unfortunately poorly sensitive in the detection of *Streptococcus pneumoniae* and *Neisseria meningitidis* (8,9). Moreover, this test is not readily available in all centres.

One option that can be taken is to empirically treat the child as having meningitis and provide a complete course of intravenous antibiotics. However, this may incur unnecessarily prolonged hospital stay and additional costs.

In our study, the decision to treat with antibiotics indicated for meningitis was made in only about half of the patients who refused LP, while in the remaining half, the option to closely observe the patient rather than start therapy for meningitis was taken. The decision to start such therapy need to be weighed between the likelihood of the patient having meningitis based on clinical evaluation and the cost or inconvenience incurred if treatment was commenced.

Obtaining a court order to compel parents to allow LP has been recommended as a last resort in some countries when parents refused the procedure (10). This option is not without implication. By obtaining a court

order, the trust of the parents on the hospital may be lost and any further steps to treat the child may be met with much hostility from the parents. LP refusal is commonly encountered in our hospital and having to get court orders in all these cases may be impractical. It may also cause the public to avoid coming to the hospital for fear of being forced to allow various procedures performed against their wishes.

Another alarming fact was that patients who refused LP were significantly more likely to discharge themselves from hospital AOR. Patients who discharged themselves AOR following LP refusal put themselves at great danger as the diagnosis and treatment of meningitis might be further delayed.

The reason for discharging AOR following LP refusal is not delineated in this study. Further studies need to be done to determine why there is this higher tendency for patients to discharge AOR following LP refusal. Possible reasons could be due to the fear in parents after being informed about the procedure or due to the negative or uncompromising stance of the doctor following parental refusal for LP. If the reasons were so, then there is a need to educate the public about the safety and usefulness of LP. Doctors should also endeavour to maintain amicable relationships with patients despite their refusal to abide by medical advice given.

Guidelines for the neurodiagnostic evaluation and management of febrile convulsion have strongly recommended the performance of LP in all children below 12 months presenting with fever and seizure<sup>(11,12)</sup>. In the light of the present finding where patients have a high tendency to discharge AOR following LP refusal, there is a need to reevaluate the indications of LP in our setting. Thorough clinical assessment and close observation are of paramount importance. Any decision to request a lumbar puncture must be made judiciously after careful evaluation of the patient and after obtaining an initial impression of the likely response of the parents towards LP. Any policy for routine LP in younger children with apparent febrile convulsion should be weighed against the risk of patients discharging themselves AOR if LP is refused.

In conclusion, refusal of LP in patients with febrile convulsion is a common and difficult problem in our setting. It can be a hindrance to the proper management of a child presenting with fever and seizure. There must be more intensive efforts to educate the public about the safety and importance of lumbar puncture.

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