

## Parental Attitudes toward Lumbar Puncture for their Children

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**Abstract: Background:** Lumbar puncture (LP) is an invasive procedure for diagnostic or therapeutic purposes. Diagnostic LP is performed to obtain samples of cerebrospinal fluid (CSF) that can be used for diagnosis of a variety of infectious and noninfectious neurologic conditions. According to the little findings in this context and its importance to child health, although immediate diagnosis and treatment especially for meningitis is necessary, but just at this moment, due to some incorrect beliefs in society, some parents may not allow physician to LP. The reality is that most of these people, if they have enough information about this issue, will not interfere. **Aim:** to assess the knowledge and attitudes of parents toward lumbar puncture (LP) performance for their children. **Methods:** This study was a cross-sectional study which was done on 50 patients who underwent LP as physician's decision admitted in pediatric intensive care unit (PICU) and neonatal care unit (NICU) in Banha University Hospitals and Banha children hospital from November 2016 to February 2018. The data collection tool was a questionnaire that consisted of two sections of the child and the parents' knowledge and attitudes. **Results:** Regarding feeling fear were present among (82%) of the studied sample. 88% of parents accept LP in their children. 50% of patients who refused LP performance by the parents died compared to only (9.1%) of patients who accepted LP performance by the parents. **Conclusion:** The main reason for fear of the majority of parents about LP in their children, were fear of some side effects such as back pain and paralysis. It is notable that late detection, misdiagnosis or delayed treatment of meningitis associated with severe side effects. Therefore informing parents of affected children is very important in the treatment of such diagnostic tests. Therefore, it seems that it is necessary to pay more attention for training in national health plans.

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**Key words:** Lumbar puncture - Parental Attitudes - Child health.

### 1. Introduction

One of the indicators of child health is public health and reducing the incidence, early diagnosis and treatment of disease is an important objective of the global health plans. One of common diseases in infants and children can be viral or bacterial infections, and noted that it can spread to the central nervous system (CNS) and causes primary or secondary infection in nervous tissue. So, one of diagnostic testing is on cerebrospinal fluid by a lumbar puncture. (*Carroll and Brookfield, 2002*).

Lumbar puncture (LP) is an invasive procedure performed by inserting a needle into the lower back (underneath the spinal L4 bony process) for diagnostic or therapeutic purposes. Diagnostic LP is performed to obtain samples of cerebrospinal fluid (CSF) that can be used for diagnosis of a variety of infectious and noninfectious neurologic conditions. Therapeutic LP involves administration of drugs, including antibiotics or chemotherapeutic agents, into the CSF (*Estcourt et al., 2016*).

Lumbar Puncture was first reported in the late 19th Century by Heinrich Iraneus Quincke, whose

patient with meningitis survived 3 procedures, and around the same time Walter Essex Wynter reported the death of 4 patients undergoing Lumbar Puncture. The procedure had a poor reputation as it was associated with high mortality due to lack of imaging techniques at this time (*Doherty and Forbes, 2014*).

Seizures associated with fever is a common finding occurred in 2-5% of children between aged 4 months to 5 years old. According to some studies in children aged less than 12 months suggests to perform LP, even despite the absence of clinical symptoms. However, the decision in this case is related to the physician's personal experience and whenever there is a suspicion of a CNS infection, lumbar puncture should be performed (*Ghotbi and Katouzian, 2006*).

Due to the LP is more invasive and different than other routine tests in children, usually parents may disagree with LP due to their anxiety that even disrupts the process of diagnosis and treatment. Although this problem is almost common, but little study has been done about it, especially in our country (*Wong et al, 2010*).

In all cases, the relative risk of performing LP has to be weighed against the potential benefit (eg, diagnosing meningitis due to an unusual or difficult-to-treat pathogen). In cases in which LP is considered necessary but the risk of bleeding is considered to be high, it may be useful to perform the procedure under fluoroscopy to reduce the chance of accidental injury to small blood vessels. According to the little findings in this context and its importance to child health, the goal of this study is to determine parental attitudes about LP in their children (**Johnson and Sexton, 2015**).

Although immediate diagnosis and treatment especially for meningitis is necessary, But just at this moment, due to some incorrect believe in society, some parents may not allow physician to LP. The reality is that most of these people, if they have enough information about this issue, will not interfere (**Tan et al., 2004**). The aim of this work was to assess the knowledge and attitudes of parents toward lumbar puncture (LP) performance for their children.

## 2. Patients and Methods

### Site/Period of Study

This study was a cross - sectional study. This study done on patients admitted in pediatric intensive care unit (PICU) and neonatal care unit (NICU) in Banha University Hospitals and Banha children hospital from Nov. 2016 to Feb. 2018.

### Patient

50 parents of children, who undergone LP as physician's decision.

### Inclusion Criteria

Patient who admitted to PICU for:

Seizures associated with fever. Suspected bacterial meningitis Patient referred by fever, nausea, vomiting or/and loss of consciousness. Children aged less than 12 month to perform LP even absence of clinical symptoms according to physician's suspicion of CNS infection.

### Exclusion Criteria

Patient with no need for doing LP as per physician's decision.

### Method

All studied cases were subjected to the following:

#### 1. Detailed history taking:

Demographic data including Name, Age, Sex, Residence and consanguinity.

Medical History of disease; onset course duration, presence of fever headache, vomiting, convulsion, blurring of vision, neck stiffness, etc.

#### 2. Through Clinical Examination:

Measurement of vital signs e.g. (HR, RR, BP and temperature)

General examination e.g. (conscious level, mentality and H.C)

Neurological Examination e.g (tone, reflexes)

### 3. Investigation

Routine investigation as CBC, CRB, ABG, Ca total and ionized, serum Glucose Level and any other recommended investigation.

Lumbar Puncture for CSF

### 4. Research tool (Researcher- made questionnaire)

The data collection tool was a questionnaire that consisted of two sections of the child and the parents' knowledge and attitudes.

#### Patient;

Nam, Age, Sex, Residence, Cause of referral and why LP?

#### Parent;

Name, Age, Sex Relative degree, Education, what do you know about LP? How do you feel when LP for your child? Do you agree to perform LP?

Why?

Fear of paralysis, LP not necessary, Fear of pain, Little information about it, Unsuccessful experience, Relative and friend recommendations, Lack of medical facilities in place, Distrust of motive of consent, Myth and remarks.

#### Ethical consideration:

- Informed consent was obtained from the parents before Enrollment in the study.

- An approval from Research Ethics Committee in Banha faculty of medicine were obtained.

### 3-Statistical analysis:

The collected data were tabulated and analyzed using SPSS version 16 software (Spss Inc, Chicago, ILL Company). Categorical data were presented as number and percentages while quantitative data were expressed as mean  $\pm$  standard deviation and range. Fisher's exact test (FET) was used as a test of significance. The accepted level of significance in this work was stated at 0.05 ( $P < 0.05$  was considered significant).

*P value > 0.05 insignificant,  $P < 0.05$  significant*

*$P < 0.001$  highly significant*

### 4-Results:

**Table: 1** demonstrated that the majority of cases were infants; males were more than females, Rural were more than Urban, most interviewed relatives were mothers and the education level of the interviewed level was mostly high school.

**Table: 2** demonstrating that the most of interviewed relatives have no information about LP, majority of them were fear from LP. The most common causes of fear were the pain and paralysis. Most interviewed relatives accept LP performance.

**Table (1): Socio-demographic characters of the studied sample.**

Variable		No. (N=50)	% (100%)
Age of the child (ys)	Mean ±SD, rang	2.5±3.9, 5 days-16 ys	
Age	Neonate	4	8.0
	Infant	32	64.0
	Preschool	8	16.0
	School	6	12.0
Sex of the child	Male	26	52.0
	Female	24	48.0
Residence	Urban	22	44.0
	Rural	28	56.0
Interviewed relative	Mother	32	64.0
	Father	14	28.0
	Grand mother	4	8.0
Education of the relative	Not educated	8	16.0
	Primary school	7	14.0
	high school	20	40.0
	Post grad	15	30.0

**Table: 3** shows Final diagnosis among the studied sample meningitis were 17 (34%) and not meningitis were 33 (66%).

**Table: 4** shows outcome according to acceptance of LP performance by the parents, where all the cured

cases were accepting LP performance. Referred here involves the cases which were assigned for Home treatment etc.

**Table (2): Attitude of children's guardians towards LP**

Variable		No. (N=50)	% (100%)
Familiar with (information about) the term of LP	Yes	23	46.0
	No	27	54.0
Feeling	Fear	41	82.0
	No fear	9	18.0
Cause of fear (n=41)	Fear of paralysis.	18	43.9
	LP not necessary	8	19.5
	Fear of pain	24	58.5
	Little information about it	17	41.4
	Relative and friend recommendations	10	24.4
	Lack of medical facilities in place	1	2.4
	Distrust of motive of consent	2	4.8
Acceptance	Yes	44	88.0
	No	6	12.0

**Table (3): Final diagnosis among the studied sample**

Variable (n=50)		No	%
Diagnosis	Meningitis	17	34.0
	Not meningitis	33	66.0

FET=12.2 P=0.006 (S)

**Table (4): Outcome according to acceptance of LP performance by the parents.**

Outcome		Acceptance of LP		Total
		Yes	No	
Cured	No.	27	0	27
	%	61.4%	.0%	54.0%
Referred	No.	13	3	16
	%	29.5%	50.0%	32.0%
Died	No.	4	3	7
	%	9.1%	6.0%	15.1%
Total	No.	44	6	50
	%	100.0%	100.0%	100.0%

### 5-Discussion:

Due to the LP is more invasive and different from other routine tests in children, Usually parents may disagree with LP due to their anxiety even disrupts the process of diagnosis and treatment. Although this problem is almost common, but little study has been done about it. (**Khakshour et al., 2013**). Our study aimed to assess the knowledge and attitudes of parents toward lumbar puncture (LP) performance for their children.

It was a cross - sectional study which done on 50 parents of children, who undergone LP as physician's decision. Our study done on patients admitted in pediatric intensive care unit (PICU) and neonatal care unit (NICU) in Banha University Hospitals and Banha children hospital from November 2016 to February 2018.

Refusal of consent to perform an LP by parents due to anxiety is a universal issue that complicates medical diagnosis and adequate management. Although this problem is common, there are few studies dealing with the subject, especially in our country.

Our study showed that, regarding to socio-demographic characters of the studied sample, age of the child ranged between 5 days and 16 years with mean  $2.5 \pm 3.9$ , regarding age, neonate were 4 (8%), infant were 32 (64%), preschool were 8 (16%) and school were 6 (12%). Regarding sex of the child, male were 26 (52%) and female were 24 (48%). Regarding interviewed relative, mother were 32 (64%), father were 14 (28%) and grandmother were 4 (8%). Regarding education of the relative, not educated were 8 (16%), primary school were 7 (14%), high school were 20 (40%) and post grad were 15 (30%). This study showed that, regarding to symptoms among the studied sample of children, 38 (76%) were convulsions, 36 (72%) were fever, 27 (54%) were DCL, 9 (18%) were vomiting, 9 (18%) were Cyanosis, 3 (6%) were neck stiffness and 2 (4%) were headache.

This agreed with (**Khakshour et al., 2013**) who aimed to assess parent 's knowledge and attitudes toward this subject. Through a cross - sectional study we evaluated 91 parents, who their child must been undergone LP as physician's decision, selected during 18 months. He found in this study, 39 children (42.9%) were female and 52 children (57.1%) were male. He found convulsions followed by fever were the most common symptoms.

Our study showed that, regarding to attitude of children's guardians towards LP regarding Familiar with (information about) the term of LP, yes were 23 (46%) and no were 27 (54%). Regarding feeling, fear

were 41 (82%) and no fear were 9 (18%). Regarding Acceptance, yes were 44 (88%) and no were 6 (12%).

Study by Wong and et al in 2010 which agreed with our study showed the main reasons for dissatisfaction LP were fear paralysis, (**Wong et al., 2010**).

Narchi study in 2013 on 24 families with discontent to LP, showed that 7 people were unfamiliar with lumbar puncture, 18 patients were fear of side effects (14 ones for paralysis and 4 cases for pain), 5 patients felt that lumbar puncture is not necessary and one of them had scoliosis (**Narchi et al., 2013**).

**Khakshour et al., (2013)** in his study found that, the main reason for LP dissatisfaction in 50 parents (54.9%) was fear of possible complications such as paralysis and back pain.

LP refusal is commonly encountered and it is impractical to obtain court orders in all these cases. Additionally, this may cause the public to avoid hospital attendance for fear of being forced to have procedures performed against their wishes. Patients who refused LP were significantly more likely to discharge themselves from hospital. This would put them at risk as the diagnosis and treatment of meningitis might be further delayed (**Ling and Boey, 2000**).

This study showed that, regarding Cause of fear, Fear of paralysis were 18 (43.9%), LP not necessary were 8 (19.5%), Fear of pain were 24 (58.5%), Little information about it were 17 (41.4%), Relative and friend recommendations were 10 (24.4%), Lack of medical facilities in place were 1 (2.4%) and Distrust of motive of consent were 2 (4.8%).

This agrees with (**Wong et al., 2010**) who found that, the main reasons for refusal of LP by parents was fear of paralysis in 48%. This agrees also with (**Khakshour et al., 2013**) who showed that reasons why parents refused LP included fear of paralysis, mental retardation, child death, painfulness, weakened kidneys and worsening of the child's condition after the procedure.

In our study, 44 (88%) expressed acceptance of LP performance by the parents. According to parents's visiting on LP in Deng's study, 71.4% of parental and in (**Wong et al., 2010**) study, 46% of parents had some satisfaction about LP (**Deng et al., 1994**).

In our study expressed acceptance of LP performance by the parents was more than (**Narchi et al., 2012**), consent which was declined by 24 parents (44%).

Also more than a study showed a high proportion of LP refusal among parents in Kuwait reaching up to 80%. (**Farag et al., 2009**).

Our study showed that meningitis diagnosis in 17 children (34%). Our findings were in consistent with some studies results (Casasoprana et al., 2013; Tan et al., 2004).

This study showed that 50% of patients who refused LP performance by the parents died compared to only (9.1%) of patients who accepted LP performance by the parents. This agreed with (Wan et al., 2017) who reported that, lumbar puncture (LP) refusal rates of as high as 30% have been reported in developing countries. Without LP, the patients may suffer suboptimal treatment or unnecessary complications or death from their disease.

Lumbar puncture is an important and relatively safe procedure to diagnose underlying central nervous system problems in children, mainly meningitis (Sadek et al., 2016).

### 6-Conclusion:

This study concluded that, regarding feeling fear were present among (82%) of the studied sample. The main reason for fear of the majority of parents about Lp in their children, were fear of some side effects such as back pain and paralysis. Since we know their fears and worries, clinicians may be better able to counsel and advise parents. 88% of parents accept LP in their children. It is notable that late detection, misdiagnosis or delayed treatment of meningitis associated with severe side effects. Therefore informing parents of affected children is very important in the treatment of such diagnostic tests. Therefore, it seems that it is necessary to pay more attention for training in national health plans. 50% of patients who refused LP performance by the parents died compared to only (9.1%) of patients who accepted LP performance by the parents. Without LP, the patients may suffer suboptimal treatment or unnecessary complications or death from their disease. Lumbar puncture is an important and relatively safe procedure to diagnose underlying central nervous system problems in children, mainly meningitis.

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