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## Evaluation of Short Term Neurological Sequelae after Discharge and At One Month in Children Admitted with Non-Tumor Non-Traumatic Intracranial Pathology in A Tertiary Referral Teaching Centre

Authors

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## Abstract

**Background-** Despite appropriate antibiotic therapy and the availability of vaccines, bacterial meningitis in children is associated with a high risk of short term and long-term sequelae. The objectives of the present study were to evaluate the neurological sequelae in non-tumor non-traumatic paediatric patients, to characterize these children from a clinical point of view, and to identify clinical variables with potential to predict neurological sequelae and complications.

**Material and Method -** *This was a observational cross-sectional study, consisting of consecutive 1824 patients admitted in Department of Paediatrics, Neta ji subhash Chandra bose medical college Jabalpur (MP), India.* 

**Result:** In our study we found that out of total death 46.15% occurred within 7 days and 30.77% after 15 days while less number of death occurred in more than 15 days of hospital stay. Among those who had sequelae at one month 73.68% cases were of more than 15 days of hospital stay. So we found that short term outcome [death] was more in cases with short duration of stay.Duration of stay also had significant association with the diagnosis of Tubercular Meningitise And Viral Encephalitise. Out of Tubercular Meningitise 66.67% And Viral Encephalitise 40% cases had hospital stay of more than 15 days duration.

**Conclusion-** Based on results of the present study, it is possible to conclude that duration of hospital stay variable had correlation with poor outcome.

Key Worlds— Hospital Stay, Paediatric Patients.

## INTRODUCTION

Numerous sequelae have been noted in survivors of bacterial meningitis; however, few studies document sequelae for several years following a childhood episode of bacterial meningitis. In addition, studies generally focus on the more commonly found sequelae. sequelae" was defined<sup>1</sup> as a complication that resulted from childhood bacterial meningitis that was present at or developed after the time of discharge and persisted during the follow-up period. Sequelae included hearing loss, vision loss, cognitive delay (including mental retardation [MR] and learning disabilities) speech and language deficits, behavioral problems, and motor delay and impairment. Deaths were reported if they occurred after the patient was discharged from the initial hospital admission but during the follow-up

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period, and were directly associated with sequelae from meningitis. Motor deficits were defined as spasticity, paresis, or paralysis of 1 or more limbs. Seizures were defined as a seizure disorder of any type that was present after hospitalization. Deafness was defined as a hearing loss of at least 30 decibels (dB) in 1 or both ears. Severe/ profound deafness was specified if identified by the authors. For patients with multiple sequelae, each sequela was identified. HEARING deficit is the most common complication of bacterial meningitis<sup>2-4</sup>. Severe neurological sequelae such as quadriparesis, spasticity or mental retardation can also occur<sup>5-8</sup>. It has been proposed that the prognosis of bacterial meningitis can be significantly improved with adjunctive treatment with dexamethasone or glycerol. Several trials suggest that dexamethasone might reduce auditory sequelae, especially those of Hib meningitis, but not fatality rate<sup>9-11</sup>.

## AIMS AND OBJECTIVES

To Evaluate Short Term Neurological Sequelae After Discharge and At One Month of Discharge of Non-Tumor Non-Traumatic Neurologically ill Paediatric Patients.

## METHODOLOGY

This was an observational cross-sectional study, consisting of consecutive 1824 patients admitted in PICU, department of Paediatrics, Neta ji

subhash Chandra bose medical college jabalpur(MP), India from September,2006 to august ,2007. The time from discharge to the maximum follow-up period of a survivor for sequelae was 1 month. All 1 year to 14 year patients with clinical symptoms and sign suggestive of neurological illness which was by laboratory confirmed and radiological investigation and ready to give consent for lumbar puncture and imaging studies were included in study. Patients with history of trauma, tumor, toxin exposure, metabolic couse, neurological insult (birth asphyxia, cerebral palsy) or any contraindication for MRI/CSF, Patients with previous neuroinfection with or without sequelae were excluded from study. We had 172 cases out of which drop out were 40 cases who either left against medical advise or found absconded from hospital. Remaining 132 cases were followed from admission till discharge or death. Out of these 132 cases, 27 cases were lost during followup. Remaining 105 cases were reexamined at one month and only there details were included in statical analysis. The following data from the records was entered into a spreadsheet: Hospital number, specific diagnosis, age and gender. Data were analyzed using descriptive statistics of mean and standard deviation, range and percentages, and the frequency distributions of the various data were calculated and presented in tables.

**TABLE – 1** Outcome At Discharge And After One Month

	8			
Serial	Outcome	No. Of Cases	Percentage	
No.				
[A] At Discharge $N = 105$				
1	Full Recovery	69	65.72	
2	Death	13	12.38	
3	Sequelae	23	21.90	
[B] After One Month Of Discharge $N = 105$				
1	Full Recovery	73	69.52	
2	Death	19	18.10	
3	Sequelae	13	12.38	
	Totl	N = 105	100	

Duration of hospital stay [DOHS]		OUTCOME Death	Total			
1 – 7 days	COUNT	6	2	1	39	46
	% within DOHS	13.04	4.35	2.17	84.78	100
	% within outcome	46.15	8.78	5.26	53.42	43.81
	% of total	5.71	1.90	0.95	37.14	43.81
8 – 15 days	COUNT	3	6	4	23	30
	% within DOHS	10.00	20.00	13.33	76.67	100
	% within outcome	23.08	26.09	21.05	31.51	28.57
	% of total	2.86	5.71	3.81	21.90	28.57
More than 15 days	COUNT	4	15	14	11	29
	% within DOHS	13.79	51.71	48.28	37.93	100
	% within outcome	30.77	65.22	73.68	15.07	27.62
	% of total	3.81	14.29	13.33	10.48	27.62
TOTAL	COUNT	13	23	19	73	105
	% within DOHS	12.38	21.90	18.09	69.52	100
	% within outcome	100	100	100	100	100
	% of total	12.38	21.90	18.09	69.52	100

## TABLE-2 Duration of Stay With Outcome Cross Tabulation

#### **INFERENCE** –

Out of full recovery cases , only 15.07% cases had full recovery with duration of stay more than 15 days . Out of total death , 46.15% cases died within 7 days of hospital stay.

DURATION OF STAY <sup>\*</sup> DEATH – p value > 0.05

DURATION OF STAY <sup>\*\*</sup> sequelae at discharge – p value < 0.0001 DURATION OF STAY <sup>\*</sup> sequelae at one month – p value < 0.0001

**TABLE – 3** Diagnosis<sup>\*</sup> With Outcome Cross Tabulation

	OUTCOME					
		DEATH	SEQUELAE	SEQUELAE	FULL RECOVERY	
DIAGNOSIS			AT	AFTER 1	AFTER 1 MONTH	Total
			DISCHARGE	MONTH		
	COUNT	8	18	17	8	33
TUBERCULAR	% within DOHS	24.24	54.54		24.24	100
MENINGITISE	% within outcome	61.53	78.26	89.47	10.95	31.42
	% of total	7.61	17.14	16.19	7.61	31.42
	COUNT	1	0	0	25	26
CEPERPAI	% within DOHS	3.84	0	0	96.15	100
MALARIA	% within outcome	7.69	0	0	34.24	24.76
	% of total	95	0	0	23.80	24.76
	COUNT	4	4	2	9	15
VIRAL ENCEPHALITISE	% within DOHS	26.66	26.66	13.33	60	100
	% within outcome	30.76	17.39	10.52	12.32	14.28

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	% of total	3.80	3.80	1.90	8.57	14.28
	COUNT	0	0	0	6	6
DVOCENIC	% within DOHS	0	0	0	100	100
MENINGITISE	% within outcome	0	0	0	8.21	5.71
	% of total	0	0	0	5.71	5.71
	COUNT	0	1	0	22	22
SEIZURE	% within DOHS	0	4.54	0	100	100
DISORDER	% within outcome	0	4.34	0	30.13	20.95
	% of total	0	0.95	0	20.95	20.95
	COUNT	0	0	0	3	3
	% within DOHS	0	0	0	100	100
OTHERS	% within outcome	0	0	0	4.10	2.85
	% of total	0	0	0	2.85	2.85
	COUNT	13	23	19	73	105
	% within DOHS	12.28	21.90	18.10	69.52	100
TOTAL	% within outcome	100	100	100	100	100
	% of total	12.38	21.90	18.10	69.52	100

#### INFERENCE

Out of total death, 61.53% cases had TUBERCULAR MENINGITISE. Morbidity was higher in TUBERCULAR MENINGITISE cases with only 24.24% cases had full recovery.

Diagnosis <sup>\*</sup> Death - p value < 0.0001

Diagnosis \* sequelae at discharge – p value < 0.0001

Diagnosis \* sequelae at one month -p value < 0.0001

Over all mortality rate 12.38% in our study was lower than the pediatric hospital based series from Nigeria<sup>12</sup> and Canada<sup>13-14</sup>. as compare to study done by BANSAL et all <sup>1</sup> our study has lesser mortality rate [12.38% vs 35.00%]. With respect to morbidity in our study 21.90% cases had sequelae at discharge, out of which 3.80% cases were recovered at one month resulting in 18.10% cases remained with sequelae at one month with full recovery in 69.52% cases. Where as in the study done by BANSAL<sup>1</sup> et all 36.00% cases had moderate to severe disability at discharge time . In our study 46.15% of death [6 out of 13 cases] occurred within three days of admission which is slightly higher than the study done by BANSAL<sup>1</sup> et all 40.00% death within 48 hours [14 out of 35 cases].

In our study we found that out of total death 46.15% occurred within 7 days and 30.77% after 15 days while less number of death occurred in more than 15 days of hospital stay. Table -1

Among those who had sequelae at one month 73.68% cases were of more than 15 days of hospital stay. So we found that short term outcome [death] was more in cases with short duration of stay. Duration of stay also had significant association with the diagnosis of TUBERCULAR MENINGITISE And VIRAL ENCEPHALITISE. Out of TUBERCULAR MENINGITISE 66.67% and VIRAL ENCEPH-ALITISE 40% cases had hospital stay of more than 15 days duration. [table - 2] On correlation analysis, we found duration of hospital stay to be significant risk factor for poor prognosis and outcome. (pearsons coefficient 0.26643 and p value -0.0060 )

On multiple regression analysis we did not find duration of stay as a significant risk factor. We have total of 13 death in our study 12.38%, out of which 6 [46.15%] occurred within 7 days of admission. Regarding morbidity in our study 23 cases has sequelae at discharge 21.90% out of which,19 cases 18.10% still had sequelae at 1 month and 4 cases 3.80% recovered during

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followup period .To find out the variable that were significant predictor of outcome either sequelae or death, correlation analysis done. We found duration of hospital stay variable had correlation with poor outcome.

## CONCLUSION

Despite of limitations, this comprehensive original article clearly demonstrates that childhood bacterial meningitis is associated with substantial long-term sequelae in survivors. As decisions are made about recommendations for use of conjugate vaccines against common etiologic agents of meningitis, the full impact of short term and long sequelae should important term be an consideration. Further studies from a variety of geographic and socio-demographic settings are needed to quantify the true societal and economic burden of short term and long-term sequelae as well as fully understand the breadth of types of sequelae that survivors experience.

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