ORIGINAL ARTICLE

Evaluation of Neurological Deficit in Hospital Discharged Encephalitis Patients

Lubuk P Saing, Robert MJ Simanjuntak, Manihar D Marbun, Iskandar Z Lubis, Bistok Saing

(Department of Child Health, Medical School, University of North Sumatra, Medan)

ABSTRACT A study was done on 30 encephalistis patients treated and discharged from Dr. Pirngadi Hospital Medan in the year 1990-1991. The study was conducted cross sectionally. The aim of the study was to find out the type and percentage of neurological deficits, including factors associated with the sequelae. Eight patients (27%) developed neurological deficit, only (3%) patient developed neurological deficits after being discharged until the period of evaluation. The neurological deficits encountered mostly were epilepsy, paraparesis, and right hemiparesis, each of which in 2 cases (7%), and monoparesis of the right limb and aphasia, each in 1 case (3%). The was no significant association of neurological deficit with prognostic factor. **[Paediatr Indones 1996; 36: 109-115]**

Introduction

Although health services have touched the whole community in general, get quality control, the attainment of health by all people and the technical and scientific application of medical science in the community is far beyond expectation.[1] Children in their growing period are faced with different calamities live infirmity, injury and disease which can definitely retard the growth and development process of the children, including mental, intelligence, self dependence, and social developments.[1]

Neurological deficit is frequently found as the sequelae of encephalitis.[2] The incidence of encephalitis is relatively high; Saing et al[3] reported that out of 7431 children hospitalized in the Paediatric Neurology Division, 33 patients (7,1%) were diagnosed as encephalitis. In Dr.

Accepted for publication: November 23, 1995. Author's address: Lubuk P Saing, MD, Department of Child Health, Medical School, University of North Sumatera, Medan, Indonesia.

Sutomo Surabaya 51 cases (14,7%) of encephalitis were treated in 1992 in the Paediatric Neurology Division.[4] In Kariadi Hospital Semarang 8 cases (12,4%) of febrile convulsions were diagnosed as encephalitis in 1992-1993. The ministry of Public Health, Thailand reported that about 1500-2000 cases of encephalitis are hospitalized every year.[6] The Center for Disease Control of the United States reported that about 20 000 cases of encephalitis are treated every year. [7]

It if for those reasons why encephalitis still constitutes an important disease entity of the neurological disease in children that needs special attention and care. The aim of this study is to know the type and frequency of neurological deficits in patients surviving from encephalitis and to find out any existing relationship between age, consciousness, leukocyte count in CSF at the time of hospital admission and the occurence of neurological deficits later on.

Methods

The study was performed cross sectionally in 1992-1993 on patients with encephalitis who were discharged from the Pediatric Neurology Division, Pirngadi Hospital, Medan, in the year 1990-1991.

Data were collected from the medical records, including personal data, diagnosis on admission, state of consciousness at the time of admission, neurological status, and results of CSF examination.

To be eligible for this study patients had to be diagnosed as encephalitis, and had to be discharged alive. Patients who made follow-up visit were evaluated at the Outpetient Clinic, while those who did not make follow-up visits were visited at their home. Patients were excluded from analysis if neurological deficits had been already present before the ailment, or those who suffered from central nervous system disease after discharged from the hospital, or those who were not found at the time of home visit.

Any of the following neurological deficits commonly found in encephalitis was recorded: paralysis, choreoathetoid movements, vision disturbance, mental retardation, behavior abnormality, epilepsy, hearing defect, respiratory problems and cardiovascular problems.[8-10].

Examination was done by history taking, physical examination and neurological examination. Developmental evaluation was done by examining the developmental milestones. Statistical analysis was done by using standard statistical computer program. The association between two qualitative data was tested by Chi Square test. We defined significant result if p value was 0,05 or less.

Results

Out of 103 patients with encephalitis hospitalized in 1990-1991, 29 patients (28%) died and 74 (72%) survived. We were able to locate 30 surviving patients to whom neurological evaluation was perfomed. Ten patients died after discharged, and in the rest 34 patients the address were not located.

Out of thirty cases to whom neurological evaluation was performed, in the medical record only 1 patient had neurological deficit after being discharged. Seven cases manifested with neurological deficit at the time of evaluation.

Table 1. Types of neurological deficits

Neurological defect type	n	%
Epilepsy	2	6,7
Right hemiparesis	2	6,7
Paraparesis	2	6,7
Monoparesis of the limb	1	3,3
Aphasia	1	3,3
Total	8	26,7

Table 2. Levels of consciousness with neurological deficit

Level of consciousness	Without deficit		With deficit		Total	
	n	%	n	%	n	%
Apathetic	2	6,7	-	-	2	6.7
Somnolence	11	36,7	3	10,0	14	46.7
Soporous	8	26,7	4	13,3	12	6.7
Coma	1	3,3	1	3,3	2	6.7
Total	22	73.4	8	26.6	30	100.0

Table 3. Age at the time admission with neurological deficit

Age	Without deficit		With deficit		Total	
(year)	n	%	n	%	n	%
<1	4	13	1	3	5	17
>1	28	60	7	23	25	83
Total	22	73	8	26	30	100

p> 0,05

Out of thirty cases only eight cases had signs of neurological deficit and the type of neurological deficit as shown in the above tables.

Age of 1 year on above from 25 cases show that 7 cases developed neurological deficit where as below 1 only 1 case out case out of 5 developed neurological deficit but statistically does not have any significance.

Table 4. Leucocyte count from CSF and neurological deficit.

Total number of CSF (mm3)	Without deficit		with deficit		Total	
	n	%	n	%	n	%
Normal	13	43.4	4	13.3	17	57,7
Pleocytosis	9	30.0	4	13.3	13	43,3
Total	22	73.4	8	26.6	30	100

p> 0,05

The total number of leukocytes in the CSF of 30 cases proves that 17 number of normal cells, pleiocytosis found in 13 cases and statistically does not have any significance with development of neurological deficit.

Discussion

The mortality rate of encephalitis in this study was 29 (28%); it was about the same as Lubis[11] finding showing a case fatality rate of 20-40%. Saing[3] reported the mortality rate of 39% in Dr. Pirngadi Hospital Medan in 1983-1985 and 21,5% in 1985-1988.[3] Budiono[12] from Sutomo Hospital, Surabaya reported a mortality

rate of encephalitis 28,1% and Kim[13] found mortality of 20% in Japanese B encephalitis and Visudiphan[6] reported 13%. Kari[14] (1992) from Negara Hospital, Bali reported that out of the total number of psychiatric and neurological patients 35 died out of which 23 of encephalitis (17%) from all the cases hospitalized in that hospital. Dwyer[15] reported the least mortality due to acute rubella encephalitis.

The neurological deficits found in our study were relatively high, i.e., 27%, consisting of 7% epilepsy, right hemiparesis 7%, paraparesis 7%, monoparesis of the right limb and aphasia 3% each. There was no patients having more than one neurological deficit. One patient had neurological deficit after being discharged and persisted at the time of the study. Rantala et al (quoted from ref. No.11), followed seventy three cases hospitalized in 1973-1983 and it was found 61 children had IQ lower than normal children. Approximately 80% of patients surviving from Japanese B encephalitis developed neurological deficits in the form of motoric disturbance, emotional and behavior disturbances, or convulsion.[13]

Corey et al[17] reported their 6-36 month evaluation to patients surviving from encephalitis; it was found that microcephaly was found in 50%, persistent convulsions in 57%, opthalmic defect in 64%, mental retardation in 57% of the cases. Budiono[12] found that after being discharged only about 9% pateints had neurological deficit. According to Farmer[18] 30% of patients surviving from measles encephalitis had neurological deficit in the form of abnormal behavior, convulsions, and mental retardation. Weil[19] evaluating their long-term follow-up of cases surviving from of encephalitis due to Enterovirus found that defect in IQ was seen in 10-15%. Whitley[7] reported a figure of 80% neurology deficit in cases encephalitis who survived and the etiologic agent was Eastern equine virus and 20% due to St. Louis virus. Whitley[7] also reported encephalitis due to Herpes simplex virus 38% the cases were without neurological deficit, 9% had moderate deficit while 53% died or had severe neurological deficit. Dwyer[15] reported that rubella encephalitis had very minor neurological deficit.

Case of encephalitis generally had depressed consciousness. In our study all encephalitis patients admitted for treatment had depressed consciousness up till coma. In Sumber Waras Hospital Jakarta consciousness depression due to encephalitis was found in 50% of cases.[20] Saing[2] reported only 68% consciousness depression from 1012 cases hospital in Dr. Pirngadi Hospital Medan from 1985-1988. Budiono[12] reported 90,6% consciousness depression. Fisman[21] reported cases with lethargy at the time of admission the prognosis would be better, the severity of encephalitis with Epteinbarr virus is relative with the severity of coma. This study consciousness depression at time of admission has not correlation and significance with development at neurological deficit. Fenichel[22] reported that cases of encephalitis due to measles had high neurological deficit but has no correlation with the of the disease.

After a long observation by Weil[19] in cases of encephalitis due to Western equine it was noticed that smaller children had severe neurological deficit. Marshall 23 reported encephalitis due to

Arbovirus in smaller children had more chances of developing neurological deficit. Cherry 8 reported that babies suffering from encephalitis normally yet infection and severe neurological deficit In this study there is no significance below 1 year or 1 child or above 1 year with neurological deficit later on (p>0,05).

Dwyer et al[15] reported that out of 14 cases of encephalitis only 3 had pleiocytosis and 10 patients developed neurological deficit where in our study 13 cases had pleiocytosis out of which statistically has no significance (P>0,5).The result of this study indicate that there is no significant correlation. This may due to the method of study and sample.

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