

ORIGINAL ARTICLE

Hydrocephalus in the Department of Child Health, School of Medicine University of North Sumatera Dr. Pirngadi Hospital, Medan

by

YAHYA G. LUBIS, T. RAZIF, MANIHAR D. MARBUN
and BISTOK SAING

(From the Department of Child Health, School of Medicine,
University of North Sumatera/Dr. Pirngadi Hospital, Medan.)

Abstract

A retrospective study to find out the incidence of hydrocephalus in the Paediatric Neurology Subdivision Department of Child Health, School of Medicine, University of North Sumatera/Dr. Pirngadi Hospital Medan, was carried out in the period of 1986 - 1989.

The number, age groups, causes and treatment were reviewed. The cases consisted of 45 children; 28 males (68.2%) and 17 females (27.8%). Most of the patients (34 = 75.5%) were found in the age group of 1 year or younger and the rest (11 = 24.5%) were in the age group of more than 1 year. The youngest was 2 days old and the oldest was 5 years and 6 months old; 33 cases were congenital, 5 cases were acquired and 7 cases with unknown causes. Conservative treatment were introduced to almost all cases, and four cases had ventricular peritoneal shunt.

Introduction

Hydrocephalus is a condition in which the enlargement of ventricular system occurs as the result of an imbalance between production and absorption of cerebrospinal fluid [1]. The obstruction of cerebrospinal flow from foramen Monroi to the arachnoid villi in the subarachnoid space will increase the volume of cerebrospinal fluid and elevate the intracranial pressure, causing an enlargement of ventricular system and subarachnoid

space [2]. Hydrocephalus is almost always caused by obstruction in the circulation and absorption of cerebrospinal fluid, rarely caused by over production of cerebrospinal fluid [3].

The objective of this study is to know the incidence and age predilection, causes and treatment of hydrocephalus in the Department of Child Health, School of Medicine, University of North Sumatera/ Dr. Pirngadi Hospital Medan.

Materials and Methods

The study was conducted retrospectively from January 1986 to December 1989 in the Paediatric Neurology Subdivision Department of Child Health, School of Medicine, University of North Sumatera /Dr. Pirngadi Hospital Medan. We collected all recorded datas of patients with hydrocephalus in that period divided according to age group, causes, treatment and reviewed. The diagnosis of hydrocephalus in Paediatric Neurology Subdivision was based on the clinical symptoms such as in-

creased head circumference more than 2 SD above the 50th percentile by the Nellhaus standard, suture widening, cracked pot sign, widely open fontanelles, accompanied by dilatation of scalp vessels and the presence of sunset sign.

All of the cases in this study had been examined at least for cranial ultrasonography / cranial x -rays / lumbar puncture or transillumination. Most of the patients had conservative treatment and four cases had ventriculo-peritoneal shunt.

Results

From 4302 cases admitted to the Paediatric Neurology Subdivision in this period, 45 (1,05%) had hydrocephalus,

which consist of 28 males and 17 females (Table I). All cases had macrocephaly.

Table I. *Number of cases according to sex*

Year	Male	Female	Number
1986	8	6	14
1987	8	4	12
1988	6	5	11
1989	6	2	8
Total	28 (62.2%)	17 (37.8%)	45

Table II. Number of cases according to age

Age (yr)	Period				Number
	1986	1987	1988	1989	
0 - 1	12	8	8	6	34
2	1	2	3	-	6
3	-	-	-	1	1
4	1	1	-	1	3
5	-	-	-	-	-
6	-	1	-	-	1
Total	14	12	11	8	45

Table III. Causes of hydrocephalus

Year	Congenital	Acquired			unknown
		Meningitis	Encephalitis	Trauma	
1986	10	-	1	3	-
1987	9	-	-	-	3
1988	8	1	-	-	2
1989	6	-	-	-	2
Total	33(73.3%)	1(2.2%)	1(2.2%)	3(6.7%)	7(15.6%)

The youngest was 2 days old, and the oldest was 5 years and 6 months. Thirty four cases were below 1 year of age, and 11 cases were in the age group of more than 1 year (Table II).

Acquired hydrocephalus was found in only 5 cases: 1 case was due to meningitis, 1 by encephalitis and 3 by head injury.

Congenital hydrocephalus occurred in 33 cases (72.6%), three of them meningocele and 1 case with meningoencephalocele and 7 cases were of unknown causes (Table III).

Cranial ultrasonography in 20 cases, showing the accumulation of CSF in the ventricles of the brain. Cranial X-Rays demonstrated wide sutures and thin cranium in 21 cases; lumbar puncture in 15 cases showed increase of the intracranial pressures in 11 cases, normal intracranial pressures in 4 cases.

Acetazolamide (Diamox) as a starting treatment with a dose of 25 mg/kg body weight seemed to be successful in the slowly progressive cases. Four cases were managed with ventriculo peritoneal shunt.

Discussion

In this study, there were 45 cases of hydrocephalus consisted of 28 males and 17 females. Most of the cases (34 patients) were in the age group of 1 year or less, and the other 11 cases were in the age group of 1 year or more. The youngest was 2 days old and the oldest was 5 years and 6 months.

Endang had found 36 cases of hydrocephalus in the period of 1979-1983, which consist of 17 (42.2%) females and 19 (52.8%) males with the youngest was 1 day old and the oldest was 4 years and 6 months, where 27 patients were in the age group of 1 year or younger and 9 cases were 1 year or older [4].

Hadisoekma found 17 cases of hydrocephalus in the period of 1985-1986, which consist of 9 (52.9%) females and 8 (47.1%) males with the youngest of one day old and the oldest was 3 years and 6 months; most (12 cases) of them were in the age group of 1 year of age or younger and 5 (29.42%) cases were 1 year or older [5].

Table III shows that most (33 cases) of the cases are congenital hydrocephalus: three cases with meningocele and one case with meningoencephalocele. Five cases had hydrocephalus of acquired type which 1 case caused by meningitis, 1 patient by encephalitis, 3 cases by head trauma and 7 cases (55.6%) had hydrocephalus of unknown origin. Endang found 12 cases (33.3%) of congenital hydrocephalus and two cases with meningocele. Four cases had hydrocephalus caused by encephalitis of acquired type and 20 (55.6%) had hydrocephalus of unknown origin [4].

Hadisoekma found 6 cases (35.29%) with congenital hydrocephalus and 1 case with acquired type; 10 cases (58.8%) had hydrocephalus of unknown origin [5]. Irawan from Yogyakarta found 16 (12.6%) cases of congenital hydrocephalus (1974-1979) [6].

Simatupang J. (1977) found 13 cases (8.1%) with congenital hydrocephalus from 160 cases of congenital abnormalities during 1974-1975 [7].

The incidence of hydrocephalus at Dr. Cipto Mangunkusumo Hospital, Jakarta in 1969 was 34.98% [8]. Gabriel (1975) suggested that hydrocephalus in neonates and children up to two years old was primarily due to embryogenic disorders. Eighty percents of all types of hydrocephalus may be caused by Arnold-Chiari malformations with or without spina bifida, and the remaining are caused by intrauterine infections and neonatal meningoencephalitis. It is suggested that the most predominant cases are congenital hydrocephalus [9].

The result of the present hydrocephalus study compared to which that was carried out by Endang and Hadisoekma are almost in the same figure. In this study the number of cases was higher than theirs, as well as number of congenital hydrocephalus. The acquired hydrocephalus and the unknown origin were relatively low in frequency. This was probably caused by the diagnosis which were now more often made by the use of sophisticated equipment such as CT-Scan.

Almost all of the hydrocephalus cases in this study received conservative treatment and four cases had ventriculo-peritoneal shunt. Endang (1978-1983) reported 36 cases of hydrocephalus with only one of them had surgical intervention [4]. Hadisoekma reported that all of his cases were managed with conservative treatment. At present, ventriculo peritoneal shunt remains the best procedure in the management of hydrocephalus [10].

The ventriculo peritoneal shunt operation is now performed more often in Dr. Pringadi General Hospital Medan because of the improvement of the medical instrument and trained neuro surgeon as well as other hospital facilities.

Conclusions

The incidence rate of hydrocephalus was 1.05% amongst 4302 patients attended the Paediatric Neurology Subdivision Department of Child Health, while the highest incidence was under 1 year old (75.5%). Congenital hydrocephalus were found in 33 cases (73.3%), and conservative treatment performed to almost all of the cases and only 4 cases had ventriculo-peritoneal shunt.

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