E-Poster # 203

Causes of microcephaly in children attending in a Disability Research Center

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Introduction

Microcephaly is defined as the head circumference smaller than expected when compared to other children of the same age, sex and ethnic background[1]. It is a developmntal malformation characterized by decreased cranial size. Mathematically microcephaly is present when OFC is below the 3rd percentile or is more than 2SD below the mean adjested for age and sex. Microcephaly indicates a significant underlying congenital, genetic, metabolic or acquired disease. Many of this condition have long term medical and neuro-developmental sequelae for the affected child with significant burden of care[2].

Objective

The objective of this review study was to determine the prevalence of microcephaly in children suffering from neurological disorders.

Materials & Methods

This prospective cross-sectional study was conducted in Childhood Disability Research Center attached to Astha Hospital, Bangladesh from 1st July 2022 to 30th June 2023. After first registration, OFC was measured in every child to detect microcephaly. The child whose OFC was <2SD for age and sex according to WHO groth chart was selected as samples for further evaluation. A total of 1250 children between 2 months to 10 years was registered and among them 475 children was diagnosed as microcephaly. Then detailed history, physical examination and developmental assessment was performed and selected for further investigations according to a flow chart (Fig. 1). After these screening, investigations (routine & special) were done according to possible clinical diagnosis. Perinatal asphyxia was considered when a newborn baby did not start spontaneous respiration within the 1st five minutes of birth with features of HIE stage II or III as described by Sarnat[3]. LBW was taken into consideration when birth weight of a baby was <2.5kg irrespective of gestational age. Neonatal infection was considered in case of positive blood culture or CRP level above 12 units/ml with at least one feature of sepsis according to Rodwell and co-workers[4]. Neonatal convulsion was considered in presence of features described by Volpe[5]. A baby having total indirect serum bilirubin level above 18mg/dl in 1 week was considered as severe neonatal jaundice.

Then final diagnosis was made and cases were classified into genetic and non-genetic groups and data were entered in SPSS 25 programme for simple statistical calculations.

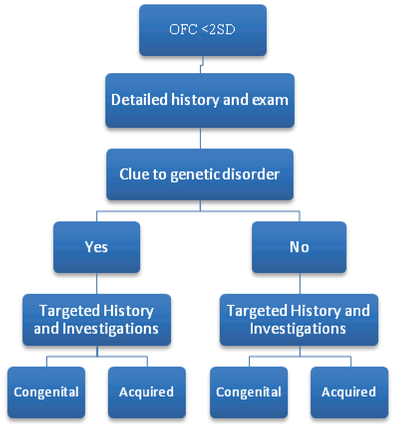

Fig. 1: Flow chart of case selection

Table 1: Basic Characteristics of samples (N=475)

Characteristics	Values (%)
Total children enrolled	1250 (100.0)
Microcephaly present	475 (38.0)
Genetic microcephaly	36 (7.8)
Non-genetic microcephaly	439 (92.2)
Sex	Male 285 (60.0)
	Female 190 (40.0)
Age	
2 months – 1 year	166 (35.0)
1 year – 5 years	204 (43.0%)
5 years – 10 years	105 (22.0%)
Family Status	
Poor class	375 (79.0%)
Middle class	83 (17.5%)
Higher class	17 (3.5%)
Parental education	
Up to primary level	309 (65.0%)
From class VI-X	133 (28.0%)
Above X Level	33 (7.0%)

Table 2: Causes of Genetic Microcephaly (N=36)

All congenital causes	
Name	Number (%)
Down Syndrome	23 (63.9)
West syndrome	5 (13.8)
Biotinase deficiency	3 (8.3)
Patau's' Syndrome	2 (5.6)
Cri-du-chat syndrome	1 (2.8)
Kabuki syndrome	1 (2.8)
Rett Syndrome	1 (2.8)
Total	36 (100.0)

Table 3: Causes of Non-Genetic Microcephaly (N=439)

Congenital		Acquired	
Name	Number (%)	Name	Number (%)
PVLBW	21(46.7)	CP (with history of HIE)	282 (71.6)
IUGR	7 (15.5)	Meningitis	26 (6.6)
Toxoplasmosis	4 (8.9)	West syndrome	13 (3.3)
Craniosynostosis	4 (8.9)	Intracranial Haemorrhage	8 (2.0)
Cong. CMV	3 (6.6)	Diabetes Mellitus	4 (1.0)
Anencephaly	3 (6.6)	Severe PEM	4 (1.0)
Cong. Rubella	2 (4.6)	Idiopathic	57 (14.5)
ZKV infection	1 (2.2)		
Total	45 (100.0)		394 (100.0)

Results

A total of 1250 children were registered and among them 475 (38.0%) children were diagnosed as having microcephaly. Among these 475 samples, 36 (7.8%) children were suffering from genetic microcephaly and 439 (92.2%) had non-genetic microcephaly. The number of male children was 285 (60.0%) and female children190 (40.0%). The male and female ratio was 3:2. Seventy nine percent (79.0%) children came from poor families with parental education up to primary level in 65% (Table 1). Among genetic microcephalic children all had congenital causes. Down syndrome was the principal cause of genetic microcephaly (Table 2). Among non-genetic microcephalic children 45 had congenital cause and 394 had acquired causes. PVLBW was the predominant cause of congenital non-genetic microcephaly and cerebral palsy with history of perinatal asphyxia was the predominant cause of acquired non-genetic microcephaly (Table 3).

Conclusions

Microcephaly is a common association of neurological diseases in children. Perinatal asphyxia is a leading cause of microcephaly in Bangladesh.

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