

A study to identify causative factors of mental handicap

AJIT DESHPANDE^{1*}, SANJAY KUBDE², RAJSHEKHAR WAVARE³,
RICHANIGAM³ and RAMKRISHNA CHANDORKAR³

¹Department of Community Medicine, 604, Adarsh Apartment,
Sri Aurobindo Institute of Medical Sciences, Indore (India).

²Department of Community Medicine, Indira Gandhi Medical College, Nagpur (India).

³Department of Community Medicine, Sri Aurobindo Medical Sciences, Indore (India).

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ABSTRACT

To identify the causative factors responsible for mental handicap. Institutional based cross sectional study was carried out in 165 mentally Challenged students of Nandanwan School Nagpur from March 2004 –May 2005. Causative factors were identified on the basis of history obtained from mothers, detailed examination of children and hospital and medical documents. Out of the 165 children Down's syndrome was causative factors in 21(12.73%), prematurity in 20(12.12%), febrile convulsions in 18(10.91%), seizures in 15(9.09%), Birth asphyxia in 14(8.48%), familial in 12(7.27%) cases. In 34 (20.61%) cases causer was not known. Only prenatal causes were responsible in 39(23.64%), only perinatal in 30(18.18%), and only postnatal 36(21.82%) cases. Rest causes were in combinations. The Common causative factors for mental handicap were Down's syndrome, prematurity, seizures, febrile convulsions during early developmental period. In addition, maternal age above 30 years was found to be a strong risk factor for Down's syndrome

Key words: Mental handicap, Down's syndrome, prematurity, seizures.

INTRODUCTION

Mental handicap has many causes behind it. It most often results from an impediment to normal brain development which can occur because of variety of reasons. The common causes are genetic disorders/conditions, Ante-natal factors, complications of labour or perinatal factors, postnatal factors and miscellaneous. In 30 to 40% cases cause is not known or detectable^{1,2}. It is very important to know the exact cause or factor responsible for it so as to prevent these factors and to treat if any cause is curable. Hence this study was carried out to know the causative factors.

MATERIAL AND METHODS

The present study was carried out to know the causative factors of mental handicap.

Study Design

Institutional based cross sectional study.

Study Subjects

Mentally challenged students and their mothers.

Study Duration

This study was conducted between the period of March 2004 to 31st May 2005.

Study Place

This study was conducted in "Nandanwan School and Sheltered workshop for mentally handicapped". It is situated at Sitabuldi, Nagpur. It is in the centre of the city and 2.5kms away from the Indira Gandhi Government Medical College, Nagpur.

202 students were enrolled in the main centre and its sub-centres during the study period. 137 students were enrolled in the main school and 55 students in sub-centres. Sub-centre wise distribution of students enrolled was as follows:

a)	Gandhibag	-	22
b)	Dharampeth	-	17
c)	Lashkaribag	-	9
d)	Chandan Nagar	-	7

This study was conducted after obtaining written permission of the superintendent of the school and approval of the ethical committee of Indira Gandhi Government Medical College, Nagpur.

Appointments with mothers of students were fixed as per their suitability. Mothers were called for the interviews. Detailed history for presenting complaints and health problems of mentally challenged students was recorded as per the predesigned proforma.

Similarly prenatal, perinatal and postnatal history, family history, history of consanguinity, history of developmental milestone and immunization history were obtained in detail and recorded in the predesigned proforma. It was verified from the medical and hospital records available with them. General and systemic examination of each mentally challenged student was carried out. Help of class teachers, social workers and attendants was taken. Female students were examined in presence of female teacher or female social worker.

Statistics

SPSS Version 10 was used to applied Chi Square test & $p < 0.05$ was considered as a significant.

RESULTS

Table 1 show the causative factors responsible for mental handicap, which were identified in mentally challenged students. They were broadly classified as prenatal, perinatal and postnatal. Probable causative factors were identified in 131(79.39%) students while cause was not known in 34 (20.61%) students.

Prenatal causes were found in 59(35.76%) of students, perinatal causes in 53(32.12%) of students and postnatal in 47(28.48%). More than one cause was found to be there i.e. prenatal, perinatal and postnatal. These were present in 26(15.76%) students in different combinations. It

Table 1: Probable/ suspected causative factors of mental handicap

S. No.	Causative Factors	No.(%)
	Prenatal Factors Genetic	
1.	Down's Syndrome	21(12.73)
2.	Familial Handicap	12 (7.27)
3.	Consanguinity	11 (6.67)
4.	Congenital Hypothyroidism	3 (1.82)
5.	Tuberous Sclerosis	1 (0.61)
	Structural defects	
6.	Microcephaly	2 (1.21)
7.	Hydrocephaly	2 (1.21)
	Maternal conditions / diseases	
8.	Pre-Eclamptic Toxemia	3 (1.82)
9.	Rubella Infection	1 (0.61)
10.	Abortifacient Used	1 (0.61)
11.	Alcohol Fetopathy	1 (0.61)
	Metabolic disorder	
12.	Phenylketonuria	1 (0.61)
	Perinatal factors	no. (%)
1.	Prematurity	20(12.12)
2.	Birth Asphyxia	14 (8.48)
3.	Low Birth Weight	9 (5.45)
4.	Cerebral Palsy	5 (3.03)
5.	Birth Trauma	2 (1.21)
6.	Fetal Distress	1 (0.61)
7.	Hypoxic Ischemic Encephalopathy	1 (0.61)
8.	Hypoglycemia	1 (0.61)
	Postnatal factors	No. (%)
1.	Febrile Convulsions	18(10.91)
2.	Seizures In Early Developmental Period	15 (3.03)
3.	Post Head Injury	7 (4.24)
4.	Post Jaundice	4 (2.42)
5.	Post Meningitis	2 (1.21)
6.	Post Encephalitic	1 (0.61)
	Cause not known	34(20.61)

was very difficult to implicate exact time of insult and as they were not mutually exclusive.

Table 2 shows distribution of mentally challenged students according to types of factors related to mental handicap. Total prenatal causes were present in 59 (35.76%) total perinatal causes

Table 2: Distribution of mentally challenged students according to types of factors related to mental retardation

S. No.	Causative Factors	No. (%)
1.	Only Prenatal	39 (23.64)
2.	Only Perinatal	30 (18.18)
3.	Only Postnatal	36 (21.82)
4.	Prenatal + Perinatal	15 (9.09)
6.	Prenatal + Postnatal	3 (1.82)
5.	Perinatal + Postnatal	6 (3.64)
7.	Prenatal + Postnatal + Perinatal	2 (1.21)

Table 3: Age of mothers at the time of birth of mentally challenged students and down's syndrome

Age of Mother	No.	Downs Syndrome No. (%)
< 20	36	4 (11.11)
20-25	64	6 (9.38)
25-30	43	5 (11.63)
30-35	13	4 (30.77)
35-40	7	1 (14.29)
> 40	2	1 (50.00)
Total	165	21 (12.73)

Age of Mother	Down's syndrome Present	Down's syndrome Absent	Total
< 30	15 (10.49%)	128 (89.51%)	143 (100%)
> 30	6 (27.27%)	16 (72.73%)	22 (100%)
Total	21 (12.73%)	144 (87.27%)	165 (100%)

$X^2 = 4.04$, d.f. = 1, $P < 0.05$

in 53 (32.12%) and total postnatal causes in 47 (28.48%) of cases.

Table 3 shows age of mothers at the time of birth of mentally challenged students and Down's syndrome. 21 students were having Down's syndrome. Out of 143 mothers whose age group was below 30 years at the time of birth of mentally challenged child, 15(10.49%) had children with Down's syndrome. While out of 22 mothers whose age were 30 or above, 6(27.27%) had children with Down's syndrome. This observed difference was found to be statistically significant ($X^2 = 4.04$, d.f. = 1, p value < 0.05). Thus it showed that maternal age above 30 years was a strong risk factor for Down's syndrome.

Table 4 shows distribution of the mentally challenged students as per their birth order. Most of the students belonged to birth order one i.e. 58 (35.15%) followed by those belonging to second birth order i.e. 47 (28.48%) and third birth order i.e. 34 (20.61%). Only 7 (4.24%) belonged to the birth order 5 and above.

Table 4: Distribution of the mentally challenged students as per birth order

Birth Order	No. (%)
1	58 (35.15)
2	47 (28.48)
3	34 (20.61)
4	19 (11.52)
5 and above	7 (4.24)
Total	165 (100)

DISCUSSION

All the three causative factors responsible for mental handicap i.e. prenatal, perinatal and postnatal was found in the study. In the present study 34% of subjects causes were unknown which was similar to Stromme (2000)⁴ and Girimaji *et al.*, (1994)⁵ In the present study it was observed that Metabolic disorders was responsible for Mental handicap, it was in accordance to findings of Lamont *et al.*, (1988)⁶. The other causes like CNS malformations, infections, alcohol fetopathy was

also observed in mental handicap⁶. In postnatal causes responsible for Mental handicap, 3 cases had CNS infections, which was similar finding of Lamont *et al.*, (1988)⁶. The Down's syndrome as a causative factor for mental handicap was found in 10% cases which was similar as reported by Ballinger *et al.*, (1991)⁷.

Familial mental handicap was present in 6% of cases this finding is in concordance with the Stromme P (2000)⁴

Ansari Ahmed Al. (1993)⁸ observed in the study of 109 Bahraini school children that 7 (6.42%) children having birth asphyxia, 1 (0.92%) cases having thyroid dysfunction and prematurity to be present in 6 (5.50%) study subjects, these findings were more or less similar to the present study.

Our findings were consistent with the previous reports that 3.6% cases had infantile hydrocephalus and 2.4% accounts for postnatal factors like post encephalitic sequel 3.6% cases had infantile hydrocephalus and 2.4% accounts for postnatal factors like post encephalitic sequel⁵

Sinclair (1972)⁹ reported that in perinatal factors, anoxia and trauma were present in 14.7%, responsible for mental handicap. The other causative factors for mental handicap were Down's syndrome (11.9%) and consanguinity 8.3% and no cause 26.2% cases was could similar to the findings of present study. In the study it was observed that recognizable syndromes (e.g.

Down's), structural CNS malformation, cultural and familial mental handicap & metabolic / endocrine are the causes for mental handicap same was quoted by Kabra *et al.*, (2003)³.

Prenatal factors were responsible for mental handicap in 38.55 of children^{8,10}: Although, Lamont *et al.*, (1988)⁶ reported it to be very less i.e. prenatal in 22(13.02%), perinatal in 40(23.69%) and postnatal in only 8(4.85%).

When factors in combinations like prenatal and postnatal, prenatal and perinatal, perinatal and postnatal and all 3 in combinations were compared findings in this study was less in than what Murtirao (1990)¹⁰ found.

Laxaminarayan *et al.*, (1991)¹¹ found similar finding related to maternal ages of children with Down's syndrome as in the study. Regarding the mothers' age at the time of the birth of their mentally challenged children & the association of birth order and occurrence of mental handicap is concern Drews *et al.*, (1995)¹² and Laxaminarayan *et al.*, (1991)¹¹ reported the similar results.

The Common causative factors for mental handicap were Down's syndrome, prematurity, seizures, febrile convulsions during early developmental period. In addition, maternal age above 30 years was found to be a strong risk factor for Down's syndrome

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