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Original Research Article

A study on maternal and perinatal risk factors of cerebral palsy among children attending a cerebral palsy clinic in Visakhapatnam

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ABSTRACT

Background: Cerebral palsy (CP) is a disorder of movement and posture, defined as an "umbrella term covering a group of non-progressive, but often changing, motor impairment syndromes secondary to lesions or anomalies of the brain arising in the early stages of its development". Risk factors for CP include maternal infection, placental insufficiency, gestational diabetes, pregnancy induced hypertension, instrumental delivery, low birth weight, hypoxic ischemic injury, hyperbilirubinemia, metabolic abnormalities (hypoglycemia). The families are affected psychologically, financially and socially. It also imposes burden on national health system. The objective of the study was to study the distribution of maternal and perinatal risk factors of cerebral palsy among children attending a cerebral palsy clinic in Visakhapatnam.
Methods: A retrospective cohort study was conducted by eliciting history from the mothers of 90 cerebral palsy children who were treated in cerebral palsy clinic, Visakhapatnam, Andhra Pradesh, India for a period of 6 months in 2016. After taking consent, data was collected using a pretested questionnaire. Detailed history was taken from the mothers of 90 cerebral palsy children regarding the period of gestation at which the child was born (preterm or full term), any previous history of pre-term delivery or abortions and neonatal complications was obtained from the care givers. Data was entered into MS-excel sheet and analysed by using SPSS Trial Version 20.
Results: Total numbers of study subjects were 90, out of which 58 were boys and 32 were girls. Around 38% of study subjects were born out of consanguineous marriage. As per the records available, only 7% of mothers had gestational diabetes. It was found that 13% study subjects were preterm, 22% had low birth weight, 24% had perinatal hypoglycaemia, 33% had neonatal jaundice and 33% had birth asphyxia.
Conclusions: Consanguinity, birth asphyxia, neonatal jaundice are found to be the important risk factors for Cerebral Palsy in our study which can be avoided by improving maternal and paediatric health services.

Keywords: Cerebral palsy, Maternal risk factor, Perinatal risk factor

INTRODUCTION

Cerebral palsy (CP) is a symptom complex, rather than a specific disease. CP is one of the most chronic conditions which may lead to disability in childhood. The prevalence of CP is 1.2-2.5 per 1000 live births although, the rates vary from country to country and also within the countries.[1] CP refers not to a single condition but to a number of different and varied chronic conditions. The traditional definition of CP is a non-progressive impairment in movement or posture caused by injury or anomaly of the developing brain.[2]

Disabled children are of great concern to the family as well as to the society. After eradication of polio, CP has emerged as one of the major causes of chronic childhood disability in India. For India, the estimated incidence is around 3/1000 live births; however, being a developing

country, the expected actual figure may be much higher. CDC has estimated that the lifetime cost to care for an individual with CP is nearly $1 million (2003).

CP is a major cause of crippling in children, but it's etiology is poorly understood.[3]

The etiological and risk factors are many and an awareness of the interplay of multiple factors in the causation of CP is crucial. Maternal risk factors for CP include maternal infection, placental insufficiency, gestational diabetes, pregnancy induced hypertension, instrumental delivery.

Perinatal factors include low birth weight, hypoxic ischemic injury, hyperbilirubinemia, metabolic abnormalities hypoglycemia. The families of the CP children are affected psychologically, financially and socially. It also imposes a huge burden on the national health system. In India, neonatal care services are facing a challenging situation especially in the rural and remote areas in the south of the country. These factors have all contributed to the increased percentage of children born with many health disorders in India. However, shortages in studies exploring the actual numbers and prevalence of these health problems have not helped those under privileged population get the proper attention they need.

Recent improvements in neonatal care have not resulted in a decline in the overall prevalence of CP and, in fact, greater numbers of very preterm, very low birth weight infants are surviving with CP and other developmental problems. Therefore, the emphasis would mainly be on the availability of a functional and efficient antenatal care and on the availability of a well-equipped neonatal care units and services to avoid the problem of having babies with CP. This study aims at highlighting the need for more emphasis on antenatal and neonatal care services in prevention of CP.

Objective

To study the maternal and perinatal risk factors of CP.

METHODS

A retrospective cohort study was undertaken among children who were diagnosed with CP by consultant paediatrician or neurologist and receiving physiotherapy at CP clinic in Visakhapatnam over a period of 6-months (October 2016 to march 2017) were enrolled. After taking informed consent, data was gathered from mothers/care givers of 90 study subjects using a pretested questionnaire.

Detailed history was taken regarding antenatal and perinatal risk factors, the period of gestation at which the child was born (preterm or full term), previous history of pre-term delivery or abortions was gathered by interviewing the mothers/care givers and from hospital records available with them. Data was entered into MS-Excel sheet and analysed by using SPSS Trial Version 20.

RESULTS

Total numbers of study participants were 90, out of which 58 (64.4%) were boys and 32 (34.6%) were girls which were depicted in Figure 1. Mean age of study subjects was 5.8 yrs.

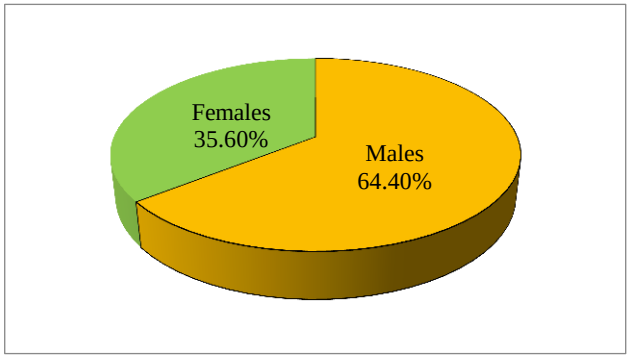

Figure 1: Gender wise distribution of children with CP.

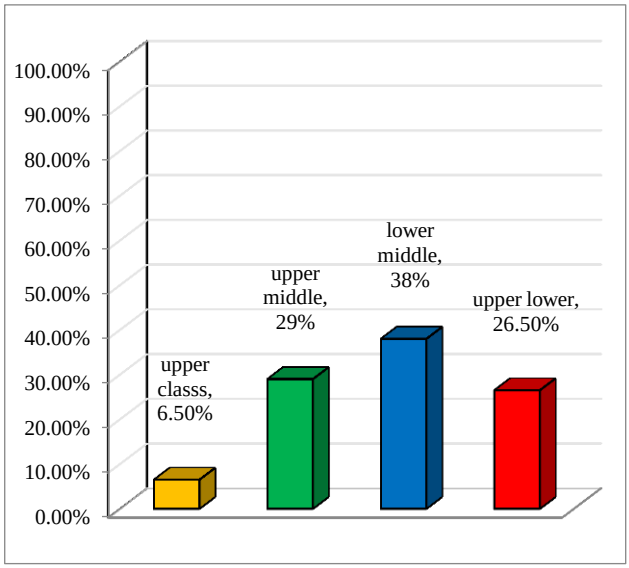

Figure 2: Socioeconomic status of the CP children.

Socioeconomic status of the study subjects according to updated BG Prasad Classification is shown in Figure 2. It shows that most of the study subjects belong to lower middle class 34 (38%) followed by upper middle 26 (29%), upper lower 24 (26.5%) and upper class 6 (6.5%).None of the study subjects belong to lower class. The various maternal and perinatal risk factors and their distribution were shown in Figure 3.

Around 38% of study subjects were born out of consanguineous marriages. Family history of CP was seen in 18% of study subjects. About 18% of the mothers of study subjects reported to have anaemia.

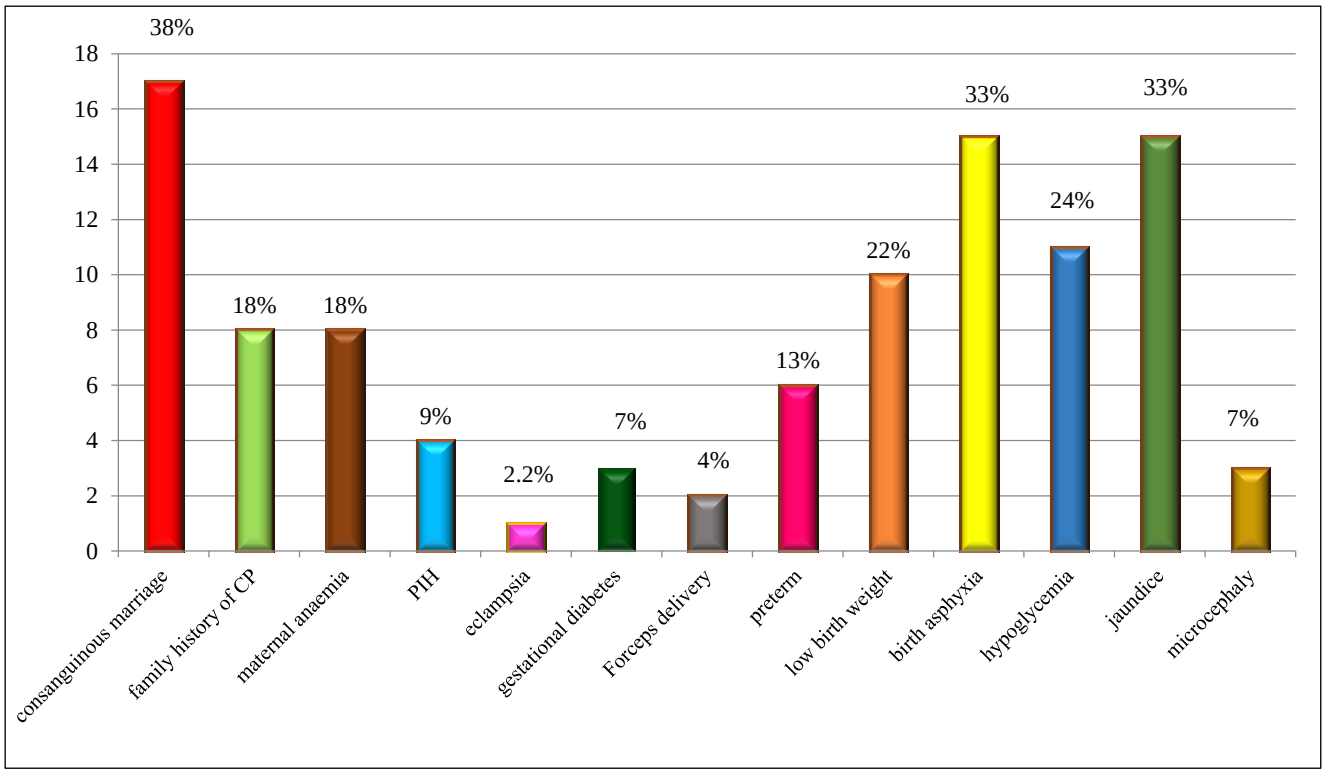

Figure 3: Distribution of risk factors for CP.

PIH, eclampsia and gestational diabetes mellitus was reported in mothers of 9%, 2% and 6% study subjects respectively. The various modes of delivery observed in our study were normal vaginal 55%, forceps 13%, caesarean -section 32% was depicted in Table 1.

Table 1: Distribution of CP patients according to type of delivery.

Type of delivery	Percentage (%)
Normal vaginal	55
Forceps	13
Caesarean section	32
Total	90 (100)

Preterm delivery was reported in 13.3%, Low birth weight in 22%. Birth asphyxia was reported in 33%, neonatal jaundice in 33% study subjects respectively.

Forty out of 90 study subjects i.e. 44% did not cry immediately after birth.

About 50 (55.5%) study subjects had intensive care unit admission at birth and 47 (52.2%) received oxygen supplementation at birth. Apgar score data could not be obtained as the data was collected from care givers and not record based. Spastic variety of CP (66.6%) was the most common presentation which was depicted in Table 2.

Table 2: Distribution of CP patients according to type of CP.

Type of cerebral palsy	No (%)
Spastic	60 (66.6)
Hypotonic	24 (26.6)
Mixed	6 (6.8)
Total	90 (100)

DISCUSSION

In the present study, most common type of CP was spastic (66.6%) whereas it was 80% in a study done by Das et al, 88% in Sahu et al done in New Delhi and 77% in a study done by Mustafa et al done in Libya.[3-5]

In our study consanguinity amounts to 38% which is similar to that found in the study done by Gowda et al and Saadi et al which was comparable with few Turkish studies who have noted a high number of marriages between relatives (21% of all marriages).[6-9] The increased frequency of consanguinity among parents of children with CP, and the strong association with a positive family history suggests the role of genetic factors in the pathogenesis of CP in this environment.

Severe asphyxia is the leading perinatal cause of CP in this study which was observed in 33% of the cases, whereas it was much higher 57% in study by Das et al.[4]

Birth asphyxia (hypoxic ischemic encephalopathy) was observed in 43% of cases in Gowda et al study.[6] Our study findings correlate with that of the findings of study done by Mustafa et al and Pattar et al which shows that birth asphyxia as an important risk factors for CP among children.[4,10]

In our study neonatal jaundice amounts to 33% which is higher than that of a study done by Gowda et al where it was only 3% and 6.7% in Sharma et al.[6,11]

In our study it was found that low birth weight is seen in 22% which was comparable with that found (28%) in study done by Daher et al and 28.8% in a study done by Sahu et al done in New Delhi and and 36% had low birth weight in study by Das et al.[3,4,12] It was 30% cases with low birth weight in a study done by Gowda et al.[6]

In the present study history of CP in the family was observed in 18% of cases whereas it was 5% Gowda et al study.[6] It was 2.5% in Sharma et al, and 2% in Hughes and Newton study.[11,13] Higher incidence observed in our study might be because of the high incidence of consanguinity observed in our study. Another most important reason could be our cultural practices to marry a relative which was highly prevalent in our societies.

In our study it was found that prematurity was seen in 13%, which was comparable with that of a study done by Gowda et al and Das et al who also found 15% cases of prematurity.[4,6]

In our study pregnancy induced hypertension amounts to 9% which is higher than that of a study done by Gowda et al, Pattar et al study, Saadi et al.[6,7,12]

Gestational diabetes is seen in 7% of mothers in our which was similar to that found in to that seen in Saadi et al.[7] Among the probable etiologic factors in the present study, perinatal factors were the most prevalent. However in a few cases, more than one probable cause was taken into account, as it was difficult to pin point one etiological agent.

CONCLUSION

Consanguinity, birth asphyxia, neonatal jaundice are found to be the important risk factors for CP in our study which can be avoided by improving maternal and paediatric health services.

Recommendations

- Considering results of this study, it is highly recommended that consanguineous marriages be prevented especially if previous consanguinity is present in the family. It is important to recognise that, marriage and our social customs are responsible to some extent for increasing number of CP cases in our country. So appropriate Genetic counselling service has to be set up, proper advice must be given to all clients.
- If CP child was already present in the family, genetic counselling may be offered in subsequent pregnancies to prevent giving birth to a child with CP.
- Premarital genetic testing should be carried out on prospective consanguineous couples; if diagnosis fails then risk estimation should be taken into account. For consanguineous couples with affected children prenatal diagnosis can be done if possible.
- Timely obstetrical intervention and immediate newborn care can still play a major role in preventing CP. Hence there is an urgent need to further strengthen the existing maternal and child health services.

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REFERENCES

1. Crooker LC. Developmental-behavioral pediatrics. Cerebral Palsy. 1994;95:579-88.
2. Wolraich M, Droter D, Dworkin P, Perrin E. Developmental-behavioral pediatrics. Evidence Practice. 2008;14:483-517.
3. Sahu S. Risk factors for cerebral palsy. Indian J Paediatr. 1997;64(5):677–85.
4. Das N, Bezboruah G, Das I. Study on the Clinical Profile of Patients with Cerebral Palsy. IOSR J Dental Med Sci. 2016;15(7):54-8.
5. Ashour BM, Sewasi M. Risk Factors & Complications of Cerebral Palsy in Misurata Hospital –LIBYA; Sch J App Med Sci. 2013;1(6):814-8.
6. Gowda VK, Kumar A, Shivappa SK, Srikanteswara PK, Shivananda, Mahadeviah M S, Govindraj M, Ramaswamy P. Clinical profile, predisposing factors, and associated co-morbidities of children with cerebral palsy in South India. J Pediatr Neurosci. 2015;10:108-13.
7. Saadi HR, Sutan R, Dhaher AM, Alshaham SA. Maternal and foetal risk factors of cerebral palsy among Iraqi children: A case control study. Open J Prevent Med. 2012;2:350-8.
8. Serdaroglu A, Cansu A, Ozkan S, Tezcan S. Prevalence of cerebral palsy in Turkish children between the ages of 2 and 16 years. Dev Med Child Neurol. 2006;48:413-6.
9. Tuncbilek E, Ulusoy M. Consanguinity in Turkey in 1988. Nufusbil Derg. 1989;11:35-46.
10. Pattar R, Yelamali BC. Clinical Spectrum and Risk Factors of Cerebral Palsy in Children. Medica Innovatica. 2015;4(2):6-9.
11. Sharma P, Sharma U, Kabra A. Cerebral palsy – Clinical profile and predisposing factors. Indian Pediatr. 1999;36:1038-42.

12. Daher S, El-Khairy L. Risk factors for cerebral palsy in Palestine children: a case control study. The Lancet. 2013;382(8):8.
13. Hughes I, Newton R. Genetic aspects of cerebral palsy. Dev Med Child Neurol. 1992;34:80-6.

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