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Pattern of cerebral palsy among children attended at selected hospital

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Abstract
Objective: To investigate the socio-demography information; to explore birth characteristics and clinical manifestation of cerebral palsy.
Methodology: The study was hospital based cross sectional Study. Convenience sampling technique was used to carry out the study. Total sample was 70. The data were collected through using structured questionnaire by face to face interview. The area of the study was Pediatric Unit of CRP, Savar, Dhaka. Descriptive statistics were used for data analysis.
Results: Investigator found among 70 participants there is 44% are from urban area and 56% are from rural area, 54.3% mothers had one child, 52.9% mothers faces prolonged labor, 52.9% mothers were attended by doctor and 28.6% were by midwife, 68.6% children are term baby, 54.3% children had birth asphyxia, 72.9% children had the history of seizure, 32.4% children communicated by crying, 22.9% children communicated by speaking word, 98.6% children have hearing ability, 62.9% children have both upper and lower limb involvement, 48.5% children have the hyper tone in the muscles, 38.6% have the alteration of tone in the muscle, 42.8% children had poor neck control and 45.7% had good neck control, 50% children had no pelvic control whether 34.3% had poor pelvic control and 15.7% had good pelvic control, 24.2% children can stand with support and 12.9% children can stand without support, 17.1% children can walk with support and 2.9% children can walk without support.
Conclusion: The result of research is including the all general people who have the child with cerebral palsy at the age of 1-9 years who attended at the Centre for the Rehabilitation of the Paralysed. Acknowledging these characteristics of cerebral palsy will be useful for the prevention and treatment of this condition in Bangladesh.

Keywords: cerebral palsy, neuroinflammation, children attended

Introduction

Bangladesh is a developing country in the World. Disability is the most common challenging issue in this country. Cerebral palsy is the most common condition that is responsible for the child disability. A child is born with any disability then it bears curse for its family, even the parents are treated as the results of great sin. This thinking has been changing day by day in most of the countries of the developed world, but some developing countries like Bangladesh have to aware enough of disability [1]. A 1999 United Nations International Children's Emergency Fund (UNICEF) study concluded that, half of the world's population under 15 years old children with disabilities appear to be overrepresented in developing regions of the world, with an estimated 85% of children with disability living in the developing world [2]. In UK, one in five children with CP (20.2%) was found. They had a severe intellectual deficit and were unable to walk. Among babies born weighting less than 1500g, the rate of CP was more than 70 times higher compared with those weighting 2500g or more at birth. The rate of CP rose during the 1970s, but remained constant during the late1980s [3].

In recent years, the prevalence of CP has been consistently expected at 2.0 to 2.5 cases per 1000 live births. These estimates turn into 15000 to 20000 children with CP in Canada and 150000 in the United States that the massive majority of whom are cared for at home by their parents and families [4]. Campbell (1998) stated that the prevalence rate of cerebral palsy is 2-25 per 1000 children in developing country. Bangladesh has recently seen an increase in the number of children diagnosed with cerebral palsy. According to disability profile, the client assess in the shishubikash clinic (Rural Centre) during January to December 1998 showed a report of child disability were 42% of total disability was cerebral palsy, among these spastic cerebral palsy is 9%. Athetoid cerebral palsy is 2%, Ataxic cerebral palsy is 3% and rest of the patient is other type of cerebral palsy [5]. Gage's study stated that cerebral palsy is primarily characterized by central nervous system abnormalities, such as loss of selective motor control and abnormal muscle tone. As a result of growth these primary characteristics often lead to secondary deficits, including bony deformities, muscle contractures and gait abnormalities, and among all type of cerebral palsy spastic cerebral palsy is the most common type of cerebral palsy [6].

Albert described that, in children with CP spastic tone on foot is the most common complication and also children suffer from foot drop or inability to raise the foot, abnormality in walking patterns, unwanted and uncontrolled movements associated with muscle imbalances and increased tone in the lower leg and foot and ankle. Abnormal movement with reference to the child with diplegia usually means a tip toe walking pattern (Equinus or a Planter flexed Gait), with the added complication of the ankle become twisted outwards (valgus ankle) or inwards (varus ankle).

As CP causes disability, the consequence of it affects physical health, social relationship of people, life in the realms of the family, friends and neighbors, psychological state and level of independence. This study showed that disability could have devastating effect on the life of disabled people, mostly in the rural area of the Bangladesh [7].

Objective

General objective

- To identify the pattern of the children with cerebral palsy.

Specific Objective

- To investigate the socio demographic information.
- To find out the birth characteristics of children with cerebral palsy.
- To explore the clinical presentation of the children with cerebral palsy.

Methodology

Study design: Cross sectional study design is used to identify the patterns of Children with Cerebral Palsy. Children with Cerebral Palsy were selected at a point in time with and without follow-up.

Study area: Data was collected from the outdoor and indoor Pediatric unit of Centre for the Rehabilitation of the Paralyzed (CRP) Savar.

Study population: The study populations were the patients with Cerebral Palsy who attended at CRP for their treatment.

Data collection: All patients who diagnosed as Cerebral Palsy by the Physician and came at CRP for first time or continuing their treatment were asked to participate in the study. There was a developed structured questionnaire after reviewing literature for asking to the participants.

Data Analysis: Quantitative data was analyzed by using SPSS 24 software. Descriptive statistics was used for data analysis. The investigator input the variables in the variable view and the data in the data view of this software. Then frequency of data was measured and collects the results.

Results

Socio-demographic information

Cross tabulation between age and gender of the child

Among 70 participants there is in the age group of 1-4 years male children are 32 (45.7%) and female children are 23 (32.9%) and in the age group of 5-9 years there are male children 11 (15.7%) and female children are 4(5.7%).

Table 1: Cross tabulation between age and gender

	Gender		
Age of the participants	Male (%)	Female (%)	Total
1-4 years	32 (45.7%)	23 (32.9%)	55(78.6%)
5-9 years	11 (15.7%)	4(5.7%)	15 (21.4%)
Total	43 (61.4%)	27 (38.57%)	70 (100%)

Educational status of mother

Among the 70 child's mothers educational status were 2.9% (n=2) had no formal schooling,25.7% (n=18) were in less than primary, 15.7% (n=11) were completed primary,14.3% (n=10) were completed S.S.C., 18.6% (n=13) were completed H.S.C., 15.7% (n=11) were completed bachelor, 1.4% (n=1) were completed masters and 5.7% (n=4) were in the group of any other means.

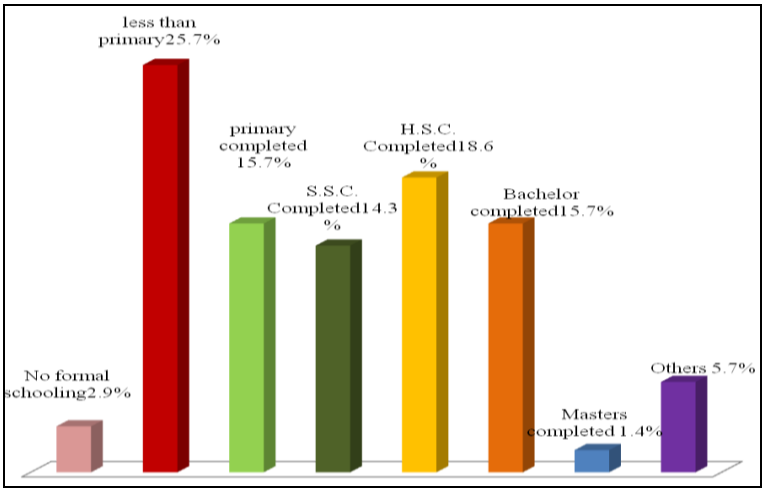

Fig 1: Educational status of the mother of the participants or children

Residential area

Forty four percent (n=31) participants were living in Urban area among the 70 participants and the rest of 56% (n=39) participants were living in Rural area of the country.

Average monthly income of the family

Among the participants 62.9% (n=44) had less than 10000-taka monthly family income and 35.7% (n=25) had more than 10000-taka monthly family income and rest of the 1.4% (n=1) had monthly income of exact 10000 taka.

Table 2: Average monthly income of the family

Average monthly income of the family	Number
10000 taka	1 (1.4%)
Less than 10000 taka	44 (62.9%)
More than 10000 taka	25 (35.7%)
Total	70 (100%)

Maternal history

First cousin marriage

Among the 70 participants most of the participants parents had not the first cousin marriage which represents 86% (n=60) and rest of them had first cousin marriage which represents 14% (n=10).

Number of child

Among the 70 mothers 54.3% (n=38) mothers had one child, 34.3% (n=24) mothers had two child and 11.4% (n=8) mothers had more than two child. The largest group of mother had the first and only child had cerebral palsy.

Table 3: Number of child of the mother of the participants

Number of child	Number	Percentage
One	38	54.3%
two	24	34.3%
More than two	8	11.4%
Total	70	100%

Any physical assault during pregnancy

Eighty percent (n=56) mother had no physical assault during pregnancy and the rest of 20% (n=14) mother had physical assault history during pregnancy.

If yes than which type of

The type of physical assault, there are 12.9% (n=9) mother had fallen down during pregnancy, 1.4% (n=1) mother got beaten during pregnancy by someone and 1.4% (n=1) mother had vehicle injury during pregnancy and 1.4% (n=1) mother had others type of physical assault. But the rest of 82.9% (n=58) mothers had no physical assault so the type of physical assault is not applicable for them.

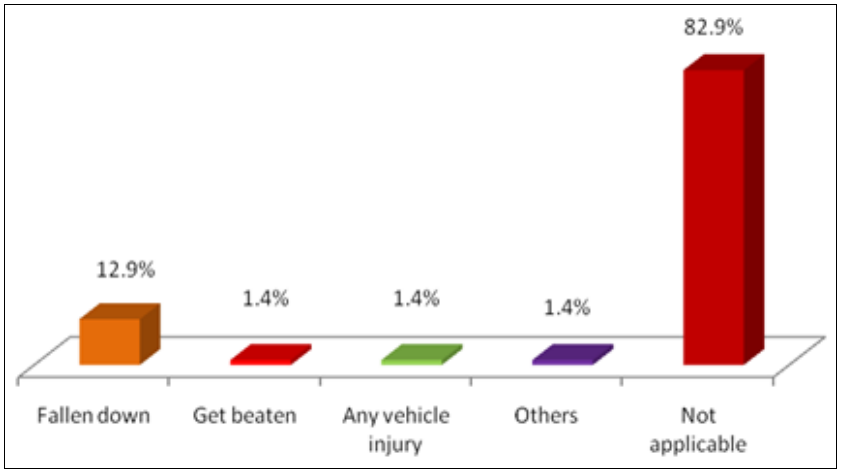

Fig 2: Type of physical assault during pregnancy

Illness during pregnancy of mother

Among 70 mothers most of the mother had no illness during pregnancy, which represents 65.7% (n=46) mothers. Mothers had High BP of 7.1% (n=5), mothers had anemia 5.7% (n=4), mothers had diabetes 4.3% (n=3), mother had infectious disease 7.1% (n=5), early discharge of amniotic fluid 7.1%(n=5) and other illness during pregnancy which represents 2.9%(n=2).

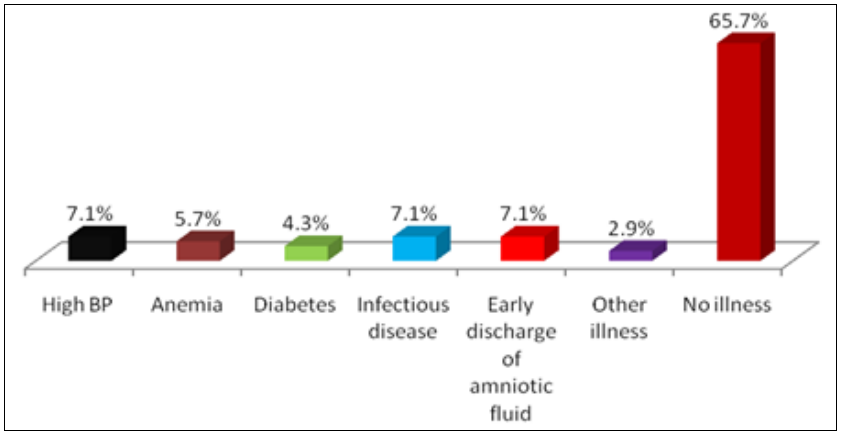

Fig 3: Illness during pregnancy of the mother

Problem during birth

Among 70 mothers 52.9% (n=37) mother faced problem during birth was prolonged labor, 38.6% (n=27) mother faced short labor during giving the child birth the rest of had sudden birth of child which represents 8.6% (n=6) of mother.

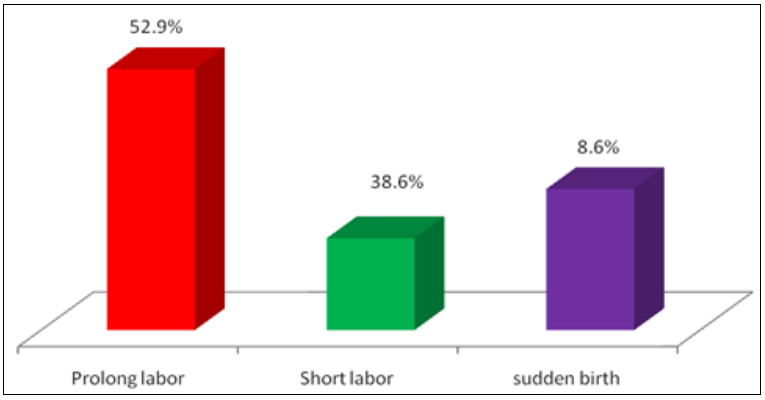

Fig 4: Problem during birth

Attended by

The number of mothers among the 70 mothers were attended by doctor was 52.9% (n=37), attended by nurse were 18.6% (n=13) of the mothers, attended by midwife 28.6% (n=20) of the mothers.

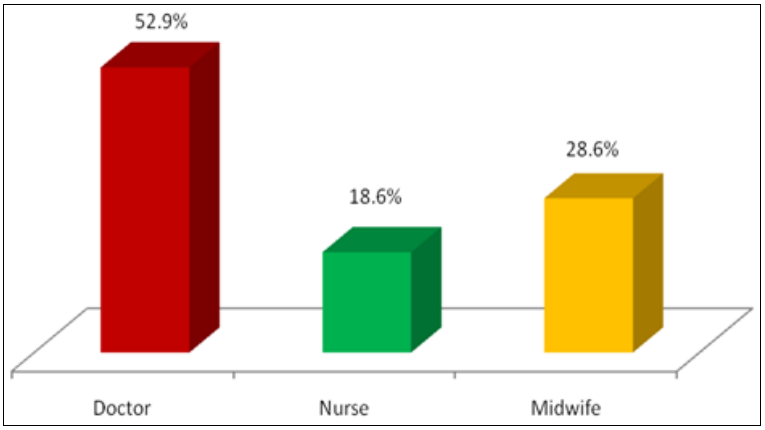

Fig 5: Mothers attended by during child birth

Birth injury

Among 70 child 17.1% (n=12) had birth injury and the rest of child had not birth injury which represents 82.9% (n=58).

Child history

Birth history of the child

There were 68.6% (n=48) children were term baby where rest of 31.4% (n=22) of child are premature baby.

Low birth weight

Among 70 participants 35.7% (n=25) of the children had low birth weight where 64.3% (n=45) of children had normal birth weight.

Birth asphyxia

Among 70 participants 54.3% (n=38) of the children had birth asphyxia where, 45.7% (n=32) of children had no history of birth asphyxia.

Neonatal jaundice

Among 70 participants 27.1% (n=19) of the children had neonatal jaundice where, 72.9% (n=51) of the children had no history of neonatal jaundice.

Dehydration

Among 70 participants 7.1% (n=5) of the children had dehydration after birth but the largest group of 92.9% (n=65) of children had no history of dehydration after birth.

Seizure

Among 70 participants 72.9% (n=51) of children had the history of seizure where, 27.1% (n=19) of children had no history of seizure. The largest group of children had seizure in common.

Respiratory problem

Among 70 participants 31.4% (n=22) of children had the history of respiratory problem where, 68.6% (n=48) of children which is the largest group of children had no history of respiratory problem after birth.

Drooling of saliva

The chart showed that 44.3% (n=31) of children had the presence of drooling of saliva where 55.7% (n=39) of children had not the presence of drooling of saliva.

Swallowing difficulty

Among 70 participants 37.1% (n=26) of children had swallowing difficulty where 62.9% (n=44) of children had no swallowing difficulty among the 70 children.

Communicating way of the child

Among 70participants 34.3% (n=24) of the children communicated by crying, 4.3% (n=3) of children used facial expression, 17.1% (n=12) of the children were making gesture, 4.3% (n=3) of the children were making sounds, 22.9% (n=16) of the children were speaking words and 17.1% (n=12) of the children were speaking sentences to communicate with their parents and others.

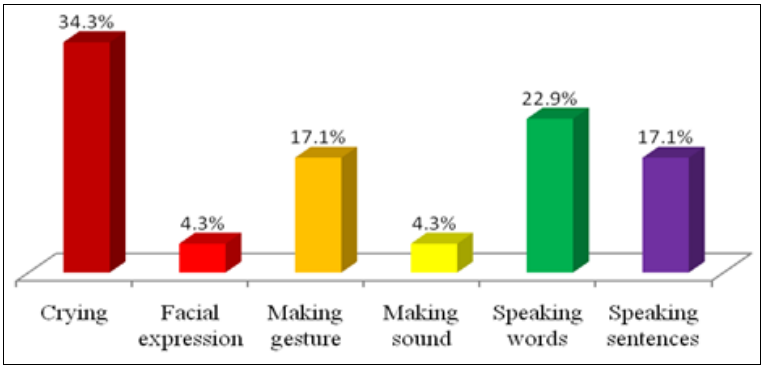

Fig 6: Communicating way of the child

Vision
This chart shows that 71% (n=50) of the children among the 70 children had the normal eye sight but 29% (n=20) of the children were squint.

Hearing ability
Among 70 participants 98.6% (n=69) of the children had the hearing ability but only 1.4% (n=1) of the children had not the ability of hearing.

Involvement of limb
Involvement of the limb of the children among the 70 children 11.4% (n=8) were one side of the body part, 25.7% (n=18) of the children had both lower limb involved, 62.9% (n=44) had both upper and both lower limb involved and this is the largest group of children among the participants.

Muscle tone
Among 70 participants 48.5% (n=34) of the children which is the largest group of the children represent hyper tone of the muscle tone of the children, 12.9% (n=9) of children had the muscle tone of hypo tone and 38.6% (n=27) of the children had fluctuating tone where they had the alternation tone.

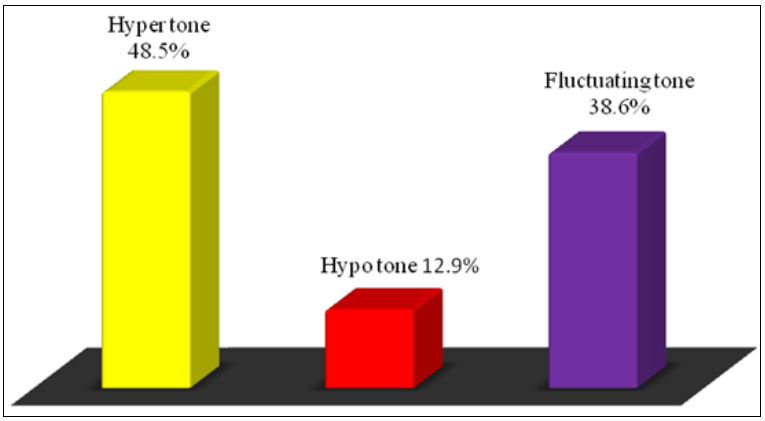

Fig 7: Muscle tone of the children

Neck control
Among 70 participants 42.9% (n=30) of the children had poor neck control, 45.7% (n=32) of children had good neck control and 11.4% (n=8) of children had no neck control.

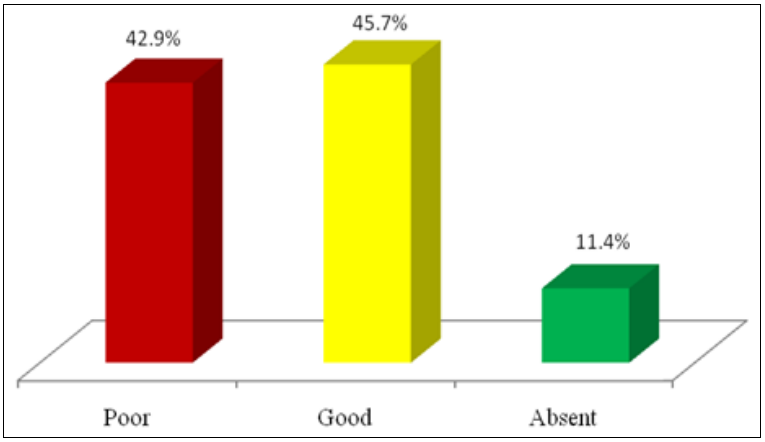

Fig 8: Neck control of the children

Trunk control
Among 70 participants 25.7% (n=18) of the children had poor trunk control, 35.7% (n=25) of the children had good trunk control and 38.6% (n=27) of the children had no trunk

control.

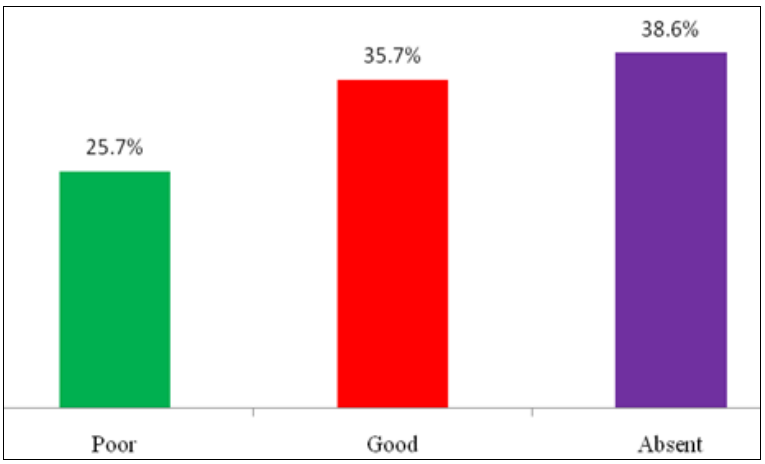

Fig 9: Trunk control of the children

Pelvic control

Among 70 participants 34.3% (n=24) of the children had poor pelvic control, 15.7% (n=11) of the children had good pelvic control and 50% (n=35) of the children had no pelvic control

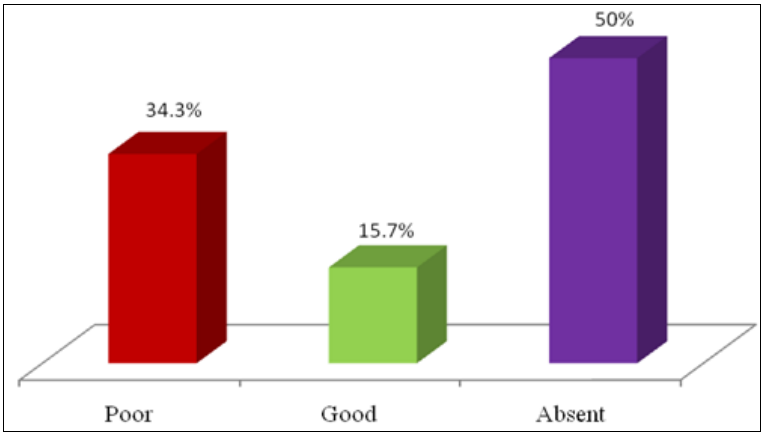

Fig 10: Pelvic control of the children

Standing

Among 70 participants 24.2% (n=17) of the children could stand with support, 12.9% (n=9) of the children could stand without support but for the 62.9% (n=44) of the children standing was not applicable.

Walking ability

This chart shows that 17.1% (n=12) of the children could walk with support, 2.9% (n=2) of the children could walk without support but for the 80% (n=56) of the children among the 70-participant walking was not applicable for them.

Discussion

The purpose of the study was to explore the pattern of children with CP in Bangladesh. This study was carried out from July 2020 to November 2020 at the pediatric unit in the Centre for the Rehabilitation of the Paralysed. Total children with cerebral palsy of below 10 year of age were the respondent. Most of the mother came from the rural area of different districts of Bangladesh. The age range of respondents was 1 to 9 year. Most of the children's mother's educational status is less than primary and the average monthly family income is below 10000 taka.

The result of the study shows that mothers had High BP of 7.1%(n=5), mothers had anemia 5.7%(n=4), mothers had diabetes 4.3% (n=3), mother had infectious disease 7.1%(n=5), early discharge of amniotic fluid 7.1%(n=5) and other illness during pregnancy which represents 2.9%(n=2). Mann et.al (2010) mentioned that Pre-eclampsia is a leading cause of preterm birth, which is strongly associated with cerebral palsy. However, there is controversy about whether pre-eclampsia is associated with increased risk of cerebral palsy. Eclampsia, jaundice, diabetes and High BP are the predominant history among the mother of CP Children. These are the variables which influences to CP.

In this study shows the number of mothers among the 70 mothers were attended by doctor was 52.9% (n=37), attended by nurse were 18.6% (n=13) of the mothers, attended by midwife 28.6% (n=20) of the mothers. Another study conducted in Bangladesh by McCarthy with 219 subjects and his result demonstrated that delivery by doctors 37.4%, nurse 13.7% and midwife 36.1% and 9.3% by relatives. In village, most deliveries happen at home without midwives or untrained midwives. Untrained midwives may not be aware of the need for oxygen resulting in problem related to delivery as a result child disability may occur (McCarthy, 1999). This study shows that among the 70

participants most of the participants parents had not the first cousin marriage which represents 86% (n=60) and rest of them had first cousin marriage which represents 14%(n=10). But Japan, India, Pakistan and the Middle East cousin marriages is high. Children produced from such close marriages show an increase in various types of genetic disorders such as birth defects, mental retardation deafness and blindness. Many pregnancies of such unions terminate prematurely; which in itself is sign of an unhealthy pregnancy, perhaps one caring a defect (Jayasekera,2004).In this study Among 70 mothers 52.9%(n=37) mother faced problem during birth was prolonged labor, 38.6% (n=27) mother faced short labor during giving the child birth the rest of had sudden birth of child which represents 8.6% (n=6) of mother. This study represents 35.7% (n=25) of the children had low birth weight where 64.3% (n=45) of children had normal birth weight. A study showed that low birth weight was also strongly associated with cerebral palsy. A total of 9% of the children with a birth weight of less than 1000 g means (low birth weight) were diagnosed with cerebral palsy. Birth asphyxia was still strongly linked with cerebral palsy and birth weight (Kari *et al.*, 2010). This study represents 54.3%(n=38) of the children had birth asphyxia where,45.7% (n=32) of children had no history of birth asphyxia. A retrospective study by Jahan (2002) from the child development and neurology unit of Dhaka Shishu Hospital shows the significance of birth asphyxia as a risk factor of childhood disability.

In this study 27.1%(n=19) of the children had neonatal jaundice where, 72.9%(n=51) of the children had no history of neonatal jaundice.72.9% (n=51) of children had the history of seizure which is the largest group of children.27.1%(n=19) of children had no history of seizure.48.5%(n=34) of the children which is the largest group of the children represent hyper tone or spastic type of the muscle tone of the children, 12.9%(n=9) of children had the muscle tone of flaccid type and 38.6%(n=27) of the children were athetoid where they had the alternation of tone. A study showed that among the cerebral palsy children there were seizure in 31.8%, vision defect in 19.8%, speech defect in 29.5%, hearing defect in 6.7% and learning disability in 25.4% children. Spastic CP is the most common type of CP and involvement four limbs is rapid. Children with CP have delay on independent sitting, standing, crawling and walking or can never achieve these abilities in their life span (Ozgun *et al.*, 2012).

Conclusion

Bangladesh is one of the populated countries in the world. Disability is a major social and economical phenomenon in the country. Cerebral palsy is one of the leading child disabilities in Bangladesh. It increases day by day. The variables which was explored was demographic factors for example birth history, birth asphyxia, birth attendance, preterm, post term delivery, pregnancy complications, cousin marriage and birth weight of cerebral palsy children. To find out the possible birth characteristics and clinical manifestations of the children after birth.

This study is conducted by 70 children with CP and their mothers. As the result of the study have demonstrated the birth and after birth characteristics of the child with CP. It shows that a great amount of mothers have had just primary education and they have limited knowledge on health education. So, health education and promotion including health care facilities should be provided for all mothers. Most of the mothers have had home delivery by traditional midwife. Emergency care was also not available for those mother and children. So, hospital delivery should be encouraged and skill birth attendance should be ensuring in case of home delivery.

This study showed that among 70 participants there is 44% are from urban area and 56% are from rural area, 54.3% mothers had one child, 52.9% mothers faces prolonged labor, 52.9% mothers were attended by doctor and 28.6% were by midwife, 68.6% children are term baby, 54.3% children had birth asphyxia, 72.9% children had the history of seizure, 32.4% children communicated by crying, 22.9% children communicated by speaking word, 98.6% children have hearing ability, 62.9% children have both upper and lower limb involvement, 48.5% children have the hyper tone in the muscles, 38.6% have the alteration of tone in the muscle, 42.8% children had poor neck control and 45.7% had good neck control, 50% children had no pelvic control whether 34.3% had poor pelvic control and 15.7% had good pelvic control, 24.2% children can stand with support and 12.9% children can stand without support, 17.1% children can walk with support and 2.9% children can walk without support. This study shows child with CP cannot achieve their normal milestone of development. So, health care facilities should be provided to these children to maintain and improve their daily living function to enhance their ability. CRP is one of the well-known rehabilitations centre in the Bangladesh where child with Cerebral palsy improve their functions by MDT approach of different health professionals and their mother can learn how to take care of them and how to ensure the list amount of independency of the child which they can achieve with their disability.

Recommendations

Like other countries, children with cerebral palsy are likely to be an upcoming burden for Bangladesh. For this reason, it is important to develop research-based evidence practice in this area. There are few studies on the characteristics of children with cerebral palsy but they are from other countries. But in our country, there should be more research on Child with cerebral palsy. So, people can aware of this type of child disability and can take of the previous and after situation of this dilemma. So, it is recommended that the next generation of health workers continue study regarding this area, this may involve-use of large sample size and participants form different districts of Bangladesh. Conduct research on other childhood problems where nurses and other health care workers can work. So, it is very important to conduct such type of research in the pediatric conditions.

This study is performed in cross sectional design. It can also perform in cohort design and may be case control design. The researcher can use the different study design and which can be conducted by vast population of Bangladesh then the result will be more significant from this study.

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