



International Journal of Orthopaedics Sciences

ISSN: 2395-1958
IJOS 2018; 4(1): 12-14
© 2018 IJOS
www.orthopaper.com
Received: 03-11-2017
Accepted: 04-12-2017

Srinivasa Rao Tatavarti
Associate Professor, Department
of Orthopaedics, Andhra Medical
College, Visakhapatnam, Andhra
Pradesh, India

Dr. Vijaya Bhushanam Meesaala
Associate Professor, Department
of Orthopaedics, Maharaja
Institute of Medical Sciences,
Nellimarla, Vijayanagaram,
Andhra Pradesh, India

Dr. Subbalakshmi TDP
Assistant professor, Department
of Anaesthesia, Andhra Medical
College, Visakhapatnam, Andhra
Pradesh, India

Correspondence
Dr. Vijaya Bhushanam Meesaala
Associate Professor, Department
of Orthopaedics, Maharaja
Institute of Medical Sciences,
Nellimarla, Vijayanagaram,
Andhra Pradesh, India

Intra natal factors associated with cerebral palsy

Srinivasa Rao Tatavarti, Dr. Vijaya Bhushanam Meesaala and Dr. Subbalakshmi TDP

DOI: <https://doi.org/10.22271/ortho.2018.v4.i1a.03>

Abstract

Cerebral palsy is a group of permanent movement disorders cause of which is multifactorial. Some Antenatal, Intranatal, Postnatal factors are associated with cerebral palsy. This study is a retrospective cohort study in which detailed birth history was taken from the mothers of 160 cerebral palsy affected children (study group) and mothers of 160 normal children (control group). History of prelabor rupture of membranes was found in 29 and 5 children of CP and normal children respectively with odds ratio of 6.862, 95% confidence interval between 2.582 - 18.233. History of Prolonged labor was observed in 14 and 3 cases of CP and normal children respectively with odds raio of 5.018, confidence interval ranging from 1.413 - 17.818. History of forceps delivery is observed in 9 and 2 cases of CP and normal children respectively, with odds ratio of 4.708 with confidence interval ranging from 1.001 - 22.148. History of Cord prolapse was present in 4 and 1 cases of CP and normal children with odds ratio of 4.0769 with confidence interval ranging from 0.4506 - 36.884. Breech presentation was present in 2 and 1 cases of CP and Normal children respectively with odds ratio of 2.0127 with confidence interval ranging from 0.1807 - 21.837. All pregnant women should be considered "at risk" of developing a complication. Regular examination a gynaecologist helps in early identification of the problematic cases, and if these cases are supervised and managed by experts, may prevent unforeseen complications to the mother and the baby.

Keywords: Cerebral palsy – Intra natal – Peri ventricular leukomalacia – Intra ventricular haemorrhage – Hypoxic ischaemic episode – Neurological damage

Introduction

Cerebral palsy (CP) is permanent movement disorders appearing in the early childhood. The etiology of cerebral palsy (CP) is multi factorial. Certain prenatal, intranatal, or postnatal factors are found to be associated with cerebral palsy. This study is an attempt to describe certain intra natal factors that are associated among children with CP

Aim

To study the intra natal factors that are associated with cerebral palsy

Materials & Methods

This Study includes retrospective cohort study, collecting detailed birth history data from the mothers of 160 cerebral palsy affected children(study group), and 160 mothers of normal children(control group) and analysis of the data collected was done.

Results

Data collected from the birth history of 160 cerebral palsy children and 160 normal children was analysed and following observations were found. History of PROM was found in 29 and 5 children of CP and normal children respectively. Odds ratio was found to be 6.818, with 95% confidence interval of lower 2.582 and upper 18.233. History of Prolonged labor was observed in 14 cases and 3 cases of CP and normal children respectively with confidence interval of lower 1.413 and upper 15.926. History of forceps delivery is observed in 9 cases and 2 cases of CP and normal children respectively with Odds ratio of 4.708 with confidence interval of lower 1.001 and upper 22.148. History of Cord prolapse was present in 4 and 1 cases of CP and normal children with Odds ratio of 4.0769 with confidence interval of lower 0.4506 and

upper 36.884. Breech presentation was present in 2 and 1 cases of CP and Normal children respectively with Odds ratio of 2.0127 with confidence interval of lower 0.1807 and upper 21.837.

Discussion

Cerebral palsy (CP) is a group of permanent movement disorders that appear in early childhood [1] Symptoms of cerebral palsy include stiff muscles, poor coordination, weak muscles, and tremors [1] Problems of sensation, vision, hearing, swallowing, and speaking may be present [1]. In cerebral palsy the injury to the developing brain may occur either in prenatal, natal, or post natal period. Normally, for proper movement of the body parts, sensory system plays crucial role. Nervous system gathers information about the position of the body parts in relation to each other and also regarding spatial orientation of the body parts. Continuous feedback is required from the motor components to the nervous system, during the course of the movement about the progress of the movement and for the errors if any to be corrected during the execution. Supplemental motor area, Premotor cortex, Primary motor cortex, internal capsule, pyramidal or cortico spinal tract, lateral cortico spinal tracts, anterior horn cells, basal ganglia, cerebellum are all involved in carrying out a movement. Basal ganglia acts as a store house for previous information regarding a particular act and helps in proper planning, initiation and smooth execution of the voluntary movement. Cerebellum, helps in maintaining the body balance in addition to completing the movement in a smooth manner.

The pre-term infant brain is vulnerable to either ischemic or haemorrhagic injury and this is related to anatomic, structural, and functional immaturity of cerebral blood vessels [2]. In a term infant, anatomic and functional maturation of the cerebral vascular system approximates to that of an adult but, but is still pressure passive by even a moderate hypoxic-ischemic episodes [2]. Hence in a asphyxiated term infant, auto regulatory function of the cerebral vascular system is lost and along with the compromised myocardial function predisposes to cerebral injury [2]. In the pre-term infant cerebro vascular injury may be reflected as Peri Ventricular Leukomalacia or Intraventricular haemorrhage. As the degree of prematurity increases, vulnerability of the brain correspondingly increases. This is particularly evident in low birth weight infants of less than 750 g [2].

The 2014 Task Force consisting of American College of Obstetricians and Gynecologists and the American Academy of Pediatrics, 2014 concluded that of the several forms of cerebral palsy, only the spastic quadriplegic type can result from acute peripartum ischemia. Other forms-hemiparetic or hemiplegic cerebral palsy, spastic diplegia, and ataxia-are unlikely to result from an intrapartum event [3].

In our study, Pre labor rupture of membranes (prom), prolonged labor, Breech delivery, Cord prolapse, Forceps delivery were factors associated with birth of cerebral palsy children.

Spontaneous rupture of the membranes any time beyond 28th week of pregnancy but before the onset of labor is called prelabor rupture of the membranes (PROM) [4]. When rupture of membranes occur beyond 37th week but before the onset of labor it is called term PROM and when it occurs before 37 completed weeks, it is called preterm premature rupture of membranes (PPROM) [4]. In this case both the fetus and mother are at greater risk for complications. About one-third of preterm births, are caused by PPRM [4]. Rupture of

membranes for more than 24 hours before delivery is termed as prolonged rupture of membranes [4]

The exact cause of premature rupture of membranes (PROM) is not understood. Some risk factors which are known to increase the chance of PROM were identified. In many cases, however, no risk factor is identified [5]. Infections like urinary tract infection, sexually transmitted diseases, lower genital infections [6], history of PROM in previous pregnancies [6], history of preterm delivery in previous pregnancies [6], Hydramnios [7], Multiple gestation [6], bleeding episodes during the pregnancy [6], Cervical insufficiency [7] are some of the factors associated.

Outcome of PROM - depends on the fetal age. The younger the fetus, the longer will be the time lapse between time of PROM and onset of labor. PROM of more than 24 hours was found to adversely affect the neonatal outcome [8]. Irrespective of the gestational age, PROM carries the risk of Chorioamnitis, which can be life threatening to both mother and the fetus [7]. This risk increases with the duration of PROM and baby undelivered [9]. PROM before 37 wks, increases the risk of complications associated with prematurity like brain bleeds and brain injury, respiratory distress, muscle dysfunction, infection, and death [7]. When the gestation is less than 24 weeks, the organs of the fetus are still in developing stage, the amniotic fluid protects the fetus from infection, physical impact, and from umbilical cord compression. It also allows fetal movement and breathing that is necessary for the development of the bones, chest, and lungs [7].

The labor is said to be prolonged when the combined duration of the first and second stage is more than the 18 hours [10]. Prolonged labor can be caused by cephalo pelvic disproportion, uterine inertia and abnormal presentations etc. Cephalo pelvic disproportion, in relation to the pelvis, is a state where the normal proportion between the size of fetus to the size of the pelvis is disturbed. The disparity in the relation between the head and the pelvis is called cephalopelvic disproportion [11]. Uterine muscle malfunction can result from uterine over distention or obstructed labor or both. Thus, ineffective labor is generally accepted as a possible warning sign of fetopelvic disproportion [12]. In cephalo pelvic disproportion, (1) There is; increased incidence of early rupture of the membranes; cord prolapse; prolonged labor and in neglected cases, obstructed labor. Increased incidence of operative interference, shock, postpartum; and hemorrhage and sepsis. Fetal risks are due to trauma and asphyxia. The net effect leads to increased perinatal mortality and morbidity [11]. Normally, as the head passes through the birth canal, due to pressure from the cervix, the flexible bones of the skull overlap and moulding takes place. Sometimes, excessive moulding can lead to tears in the meninges, resulting in intra cerebral haemorrhage and possible death. If obstructed labour is allowed to continue for a long time, the fetus suffers anoxia which leads to brain damage [13].

The fetal dangers of concern in Breech presentation are intrapartum fetal death, Intra cranial haemorrhage, Birth asphyxia due to cord compression, placental site retraction, premature respiratory efforts when head is still inside, cord prolapse, delayed delivery; birth injuries of which most important is long term neurological damage with resultant morbidity of the surviving child [14].

In a study by Kakou C *et al*, in 92 cases of cord prolapse, they opined that fast care by caesarean could improve significantly the fetal prognosis by relieving the cord compression as early as possible [15]. In a population based study by Kahana *et al*,

they concluded that prolapse of the umbilical cord is an independent risk factor for perinatal mortality^[16].

When instrumental delivery is considered, of the various complications of forceps delivery, Intracranial hemorrhage sometimes leading to death can occur. In a review by O'Mahony F, Settatee R, Platt C *et al.* they opined that when cranial traumatic injury was observed, it was almost always associated with physical difficulty at delivery and the use of instruments^[17].

Conclusion

Previously used method of "risk approach", for selecting women for specialized management is not useful, because evidence shows that many women categorized as "high risk" do not actually experience a complication, while many women categorized as "low risk" do. All pregnant women should therefore be considered "at risk" of developing a complication (WHO). Of the various factors that were associated with cerebral palsy and discussed above, most of the factors can be better managed by regular examination of the pregnant woman by gynaecologist from the beginning of the pregnancy, aided by the recent investigative modalities, which helps in early identification of the problematic cases, and if these cases were supervised and managed by experts, most of the unforeseen complications to the mother and baby can be avoided which if allowed to occur may lead to long term morbidity particularly neurological damage (cerebral palsy) of the survived child.

Acknowledgements

Our sincere thanks to all the mothers and the children, who have participated in this study by giving valuable information with utmost patience without whom the study would not have been possible.

Our sincere thanks to the authors mentioned in the references, as their study gave us in depth understanding about the various topics mentioned in this study.

References

1. Cerebral Palsy: Hope through Research. National Institute of Neurological Disorders and Stroke. July 2013. Archived from the original on 21 February 2017. Retrieved 21 February, 2017.
2. James Gage R, Michael Schwartz H, Steven Koop E, Tom Novacheck F. The identification and treatment of gait problems in cerebral palsy, clinics in development medicine, 180-181(2.1):71-75.
3. Williams Obstetrics. Diseases and injuries of the term new born. 24th edition, chapter 33, 639.
4. Dutta's DC. Text book of Obstetrics: Preterm labor, Preterm rupture of the membranes, Post maturity, Intrauterine death of the fetus, 7th edition, 21, 317.
5. Cunningham F. Williams Obstetrics. New York: McGraw-Hill Education. 2014, 23. Abnormal Labor. ISBN 978-0071798938.
6. Beckmann Charles. Obstetrics and Gynecology, 6e. Baltimore, MD: Lippincott Williams & Wilkins. Premature Rupture of Membranes, 2010; 22:213-216. ISBN 978-0781788076
7. DeCherney Alan. Current Diagnosis & Treatment: Obstetrics & Gynecology. New York: McGraw-Hill Medical. pp. Chapter 14: Late Pregnancy Complication, section: premature rupture of membranes, 2013. ISBN 978-0071638562.
8. Outcome of Term Pregnancies with Premature Rupture of

Membranes in Whom Labour was Induced with Oral Misoprostol Authors Dr Mohini Agarwal, Dr Vaishali Pachpande, Dr Sangeeta Ramteke, Dr Shalini Fusey <http://jmscr.igmpublication.org/v4-i11/11%20jmscr.pdf>

9. Practice Bulletins No. 139". Obstetrics & Gynecology. 122 (4): 918–930. October 2013. doi:10.1097/01.AOG.0000435415.21944.8f. PMID 24084566. Retrieved 12 November 2014.
10. Dutta's DC. Text book of Obstetrics: Prolonged labor, obstructed labor, Dystocia caused by fetal anomalies, 7th edition, 26, 401.
11. Dutta's DC. Text book of Obstetrics: Contracted pelvis, 7th edition, 23, 352.
12. Williams Obstetrics. Abnormal labor, 24th edition, 23, 456.
13. Abc Education material for teachers of midwifery: midwifery education modules (PDF) (2nd ed.). Geneva [Switzerland]: World Health Organisation. 2008, 17-36. ISBN 9789241546669.
14. Dutta's DC. Text book of Obstetrics: Malposition, Malpresentation, Cord prolapse, 7th edition, 25, 374.
15. International Journal of Reproduction, Contraception, Obstetrics and Gynecology Kakou C *et al.* Int J Reprod Contracept Obstet Gynecol. 2017; 6(10):4258-4262 www.ijrcog.org
16. Kahana B, Sheiner E, Levy A, Lazer S, Mazor M. Int J Gynaecol Obstet. 2004; 84(2):127-32. Umbilical cord prolapse and perinatal outcomes.
17. O'Mahony F, Settatee R, Platt C *et al.* Review of singleton fetal and neonatal deaths associated with cranial trauma and cephalic delivery during a national intrapartum- related confidential enquiry. BJOG. 2005; 112:619-26.