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# DEVELOPMENT DELAY AND SEIZURES DUE TO BIRTH ASPHYXIA IN A PAEDIATRIC PATIENT: A CASE REPORT

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## ABSTRACT

Birth asphyxia occurs when a baby does not receive enough oxygen before, during or just after birth. It can be due to inadequate oxygen levels in the mother's blood to or due to lowered respirations caused by anesthesia or inadequate relaxation of the uterus during labor that prevents oxygen circulation to the placenta. Birth asphyxia often results in short term and long term complications like seizures, cerebral palsy and development delays and in certain cases resulting in morbidity and mortality. Seizure disorders may arise due to the lack of oxygen and other complications associated therewith. Similarly, development delay is the condition when a child is unable to meet the developmental milestones at expected times. Delays can occur in areas such as motor, language, social or thinking skills. Recent reports show that birth asphyxia is a major cause for neonatal seizures, delayed developmental milestones and related complications.

**KEYWORDS:** Birth asphyxia, Development delay, Seizures, Delayed Milestones.

## INTRODUCTION

Asphyxia is one of the leading causes of neonatal mortality and morbidity in developing countries. In resource poor settings it is of paramount importance to develop simple, clinical markers that will identify babies at high risk for adverse neurological outcome so that

targeted interventions can be instituted in a timely manner to limit morbidity. Birth asphyxia is when a child's brain has experienced oxygen deprivation. Oxygen deprivation can happen in a few ways, usually related to the pinching of the umbilical cord due to doctor's ignorance of its location or a doctor's malpractice. According to WHO, 4 millions deaths per year had occurred due to birth asphyxia, representing 38% of all deaths of children under 5 years of age. In low-income countries, 23% of all neonatal deaths occurred due to birth asphyxia.[1]

Developmental delay (DD) is then a term used for children who lack developmental features and skills in the language, motor and social/personal adaptation in developmental areas that would be expected of children of their age.[2] If the birth asphyxia is severe enough to injure the brain, the baby will usually develop other complications such as hypoxic-ischemic encephalopathy (HIE) soon after birth. Hypoxic ischemic encephalopathy is an important cause of permanent damage to central nervous system cells, which may result in neonatal death or manifest as cerebral palsy and/or developmental delay. In many studies, hypoxic ischemic encephalopathy has been reported as the main etiology of developmental delay.[2] Hence birth asphyxia has been found to be one of the major cause for neonatal seizures and related complications.

Predicting neurodevelopmental outcomes in infants with asphyxia has always been a major challenge for clinicians.[4] Causes of perinatal birth asphyxia may be maternal or fetal. Those who survive asphyxia at birth may have chance to develop neurological complications including seizures, cerebral palsy and developmental delay.[1] Cognitive and behavioral difficulties can also be expected because of the patterns of brain injury that have been associated with neonatal encephalopathy. The hippocampus and striatum are among the brain structures that can be affected.[8]

With the advent of newer technologies such as cranial ultrasonography, Doppler ultrasound of the middle cerebral artery, computed tomography scanning and magnetic resonance imaging, There are now tools available to delineate cerebral damage and help predict long-term neurodevelopmental outcome.

However, availability and accessibility of these modalities are limited or non-existent in developing countries. Therefore. clinicians in these settings still rely heavily on clinical parameters to help them determine prognosis.[4]

## CASE PRESENTATION

This is the case of a 3 year old male patient who was presented with fever, cold and cough with expectoration for past one week and one episode of seizure on the previous day. Sputum examination showed liquous, yellow colored sputum. Patient had shown delayed developmental milestones since birth and is a known case of neonatal seizure disorder. Patient had been admitted in hospital 2 years ago due to seizure and took treatment. Also had a hospital admission 1 year ago for circumcision. On examination, the child looked dull and weak.

Seizure had occurred with symptoms of jerky movements of legs and hands along with breathing difficulties and loss of bowel and bladder control-myoclonic seizures. This was followed by high body temperature and the patient was immediately taken to hospital. On routine investigation, the patient's complete blood picture was tested.

The Lymphocyte count was elevated and granulocyte count was decreased. ESR count was elevated to 30mm/h along with a fall in the MCHC and MCH count. Chest X-ray had shown increased bronchovascular marking. Patient was diagnosed to have seizure disorder, delayed developmental milestones,lower respiratory tract infection and pneumonia. The first line treatment for paediatric myoclonic seizures is sodium valproate followed by lamotrigene and levetiracetam. This patient had been treated with Inj.Amoxicillin-clavulanic acid 600mg IV BD, Syp. Paracetamol250mg 4ml PO QID, Syp.Monteleukast-Levocetirizine5ml HS, Syp.Sodium Valproate 3ml BD, Syp.Amoxicillin-clavulanic acid 20mg 5ml BD and Syp.Acebrophylline 1.25ml BD. In about 4 days, conditions of the child improved and cough and fever reduced and the patient was discharged on $5^{th}$ day of hospital admission.

## DISCUSSION

As per WHO, about 4–9 million newborns babies develop birth asphyxia each year and many of them develop severe consequences such as epilepsy, cerebral palsy and developmental delays.[1]

In this study, patient is a 4 year old male child who is known to have birth asphyxia and is also a known case of neonatal seizures. Patient is known to have development delays since birth the cause of which is attributed to asphyxia at the time of birth. Birth asphyxia is known to be a leading cause of neonatal mortality, and those who survive may suffer from hypoxic–ischemic brain injury which can affect vulnerable areas of the brain leading to neuro-

developmental sequelae including problems with sensory-motor, auditory and language processing.[9] In a study conducted by Gonzalez de Dioz et al, a significant association was seen between severity of perinatal asphyxia and neurologic sequelae.

This child was reported of having 1 episode of neonatal myoclonic seizures with a history of seizure that happened two years ago. There is significant association between seizures and microcephaly with abnormal neuro-developmental outcome making recurrence of seizures and slow head growth, important predictors of cerebral palsy.[9] Using the WHO definition, a study in Sub-Saharan Africa, found that 87% of infants with birth asphyxia, survived to discharge.[9] Incase of asphyxia, major manifestations are produced as a result of hypoxia and ischemia of the brain and other vital organs. It occurs due to combination of vasodilatation and vasoparalysis.[1] The incidence rates in some studies had revealed abnormal neurological outcome- 14%, abnormal tone-14%, developmental delay -12%, seizures -12% and microcephaly -12%. Studies had also shown that HIE is associated with a high incidence of seizures, reportedly in 40–60% of cases.[5] One of the most common cause of symptomatic neonatal seizures has been attributed to hypoxic/ischemic encephalopathy (HIE), which affects approximately 1–2/1000 live births.[5] Hypoxic ischemic encephalopathy was found to be the main etiology of developmental delay in a study conducted by Seraphin Nguefack, Karen Kengne Kamga et al.

## CONCLUSION

Birth Asphyxia is a major health problem in paediatric patients. It can lead to consequences like Development delays and reccuring seizure disorders. Hence. long term follows up of all those babies are needed to detect subtle neurocognitive abnormalities.

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