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ORIGINAL ARTICLE

PERINATAL ASPHYXIA-CLINICAL PROFILE IN M R A MEDICAL COLLEGE AMBEDKAR NAGAR UTTAR PRADESH

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ABSTRACT: BACKGROUND: Perinatal asphyxia is a condition during the first and second stage of labour in which impaired gas exchange leads to fetal hypoxia and hypercarbia. Perinatal asphyxia is a common cause of mortality and morbidity in neonatal intensive care units. Although many studies are there but no such study was available from the studied area. So this study was conducted to know the clinical correlations of perinatal asphyxia in this area. **AIMS:** This study was conducted to study various maternal and neonatal risk factors for perinatal asphyxia and to study the various clinical features of perinatal asphyxia with special reference to central nervous system and to grade the encephalopathy as per Sarnat and Sarnat staging. **SETTINGS:** Neonatal intensive care unit of MRA Medical College Ambedkar Nagar. **DESIGN:** Observational study. **MATERIAL AND METHODS:** Neonates admitted in NICU with history of perinatal asphyxia as per the definition by WHO. **RESULTS:** Various feto-maternal factors were associated with asphyxiated neonates. Those observed to be significantly associated with asphyxia (in decreasing order of risk) included no antenatal check-ups (50%), home delivery (40%),fetal distress (25%), meconium stained liquor (23.3%), prolonged labour (20%), prolonged rupture of membranes(16.7%) antepartum haemorrhage (13.3%),severe anemia (10%), eclampsia(8.3%),premature rupture of membrane (6.6%), obstructed labour (5%).In many of the cases more than one risk factor was associated. Of the total 120 asphyxiated neonates 80 (66.6%) had encephalopathy. As per Sarnat and Sarnat staging 24(20%) were in stage 1, 36(30%) were in stage 2 and 20(16.6%) were in stage 3 of Hypoxic Ischemic Encephalopathy. Other than neurological dysfunction symptoms which were also associated in asphyxiated newborn were feeding difficulties(75%), respiratory distress (25%), meconium aspiration syndrome(13.3%),acute renal Failure(8.3%),apnea(4.2%). **CONCLUSION:** Perinatal asphyxia is a common cause of morbidity and mortality. Many cases are due to poor antenatal checkups and home delivery. We recommend that more and more expectant mother to be motivated for antenatal examination to detect any pregnancy complication at its earliest and to promote more and more of institutional deliveries.
KEYWORDS: Perinatal asphyxia, encephalopathy, Sarnat and Sarnat staging.

INTRODUCTION: The neonatal period is highly vulnerable period for the infant who is completing many of the physiological adjustments required for the extra uterine existence. Perinatal asphyxia is one of the leading causes of morbidity and mortality in neonatal intensive care units. Perinatal asphyxia is defined as per WHO as, ''Failure to initiate or sustain breathing at birth."[(1)] A similar definition of perinatal asphyxia was used by National Neonatal Perinatal Database 2000 (NNPD 2000), in this definition perinatal asphyxia was further divided into mild, moderate, severe asphyxia. Mild asphyxia is Apgar score of less than 7 at one min of age. Moderate asphyxia is Apgar score between 4 to 7 at one min of age or slow gasping breathing at one min of age. Severe asphyxia is defined as Apgar score of less than 3 at one min of age or no breathing at one min of age.[(2,3)]

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The American College of Obstetrics and Gynaecology (ACOG) and American Academy of Pediatrics has also defined perinatal asphyxia as:

1. Profound metabolic or mixed academia (pH<7.00) in cord.
2. Persistence of Apgar score 0-3 for longer than 5 mins.
3. Neonatal neurologic sequelae (eg. seizures, coma, , hypotonia).
4. Multiple organ involvement (eg. of the kidney, lungs, liver, heart, intestine).[4]

The overall incidence of perinatal asphyxia is 1% to 1.5 % of live births in developed countries. It occurs in 0.5% of live born newborns>36 week's gestation and accounts for 20% of perinatal deaths (50% if stillbirths included).[5] Incidence of perinatal asphyxia as reported in National Neonatal Perinatal Database 2000 (NNPD 2000) was 9% of all intra mural deliveries (Apgar score <7 at one min). Perinatal Asphyxia was responsible for 20% of all neonatal death.[2] Perinatal asphyxia results in multiple organ dysfunction. Hypoxic ischemic encephalopathy is another complication of perinatal asphyxia and the infants with moderate and severe HIE are more prone to develop cerebral palsy.

More than 100 years have elapsed since the publication of a classic paper by Little 1861[6] on asphyxia neonatorum. Since then many clinical, pathological and experimental studies have been carried out to link various neurological abnormalities to specific disorder of gestation or the neonatal period. Therefore because of high incidence of the problem and relative paucity of data on perinatal asphyxia from the study area this study was conducted for the evaluation of clinical correlations of perinatal asphyxia.

The objectives of the study were to:

1. To determine the various obstetrical and neonatal risk factors predisposing to birth asphyxia.
2. To study the clinical features specially pertaining to the central nervous system and grade the hypoxic ischemic encephalopathy according to the Sarnat and Sarnat staging.[7]

MATERIAL AND METHODS: The present study was carried out in the Neonatal Intensive Care Unit of Department of Pediatrics Mahamaya Rajkiya Allopathic Medical College Ambedkar Nagar from March 2012 to December 2013.During this period 120 neonates with perinatal asphyxia were admitted in NICU of our hospital.

Inclusion Criteria: As per WHO'S definition of birth asphyxia- failure to initiate or maintain breathing at birth.

Exclusion Criteria: Neonates with major congenital anomalies were excluded from the study.

A detailed history was taken regarding maternal age, parity, number of antenatal visits and diseases like diabetes mellitus, prolonged fever, exanthemata, hypertension, eclampsia, convulsions, cardiovascular disorder, antepartum haemorrhage, rupture of membranes, prolonged obstructed labour, breech or other abnormal presentation, caesarean section, instrumental delivery, umbilical cord accidents, meconium stained amniotic fluid and foetal distress, home delivery/institutional delivery.

All the asphyxiated neonates were examined for level of consciousness, muscle tone, activity, tendon reflexes, primitive reflexes like Moro's reflex, rooting reflex, sucking reflex, grasp reflex, posture, size and reaction of the pupils, presence of jitteriness and seizures. Head circumference was also measured in each case and fontelles palpated. All asphyxiated newborns were grouped in three

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stages as per Sarnat and Sarnat staging. The stage of HIE assigned to the neonate was the one which was most severe.

RESULTS: During our study period from March 2012 to December 2013 a total no of 120 neonates of perinatal asphyxia were admitted in the NICU of Mahamaya Rajkiya Allopathic Medical College Ambedkar Nagar. There were 20 neonates in the preterm group, 96 in the term group, and 4 in the post term group. As per birth weight 48(40%) neonates were low birth weight (birth weight less than 2.5 kg) and 72 (60%) neonates were normal birth weight (birth weight more than 2.5 kg).Out of 120 asphyxiated neonates 42 (35%) were delivered by caesarean section, 6 by forceps, 4 were breech presentation, 68 neonates were born by normal vaginal route with vertex presentation.

Various feto-maternal factors were associated with asphyxiated neonates. Those observed to be significantly associated with asphyxia (in decreasing order of risk) included no antenatal check-ups (50%), home delivery (40%), fetal distress (25%), meconium stained liquor (23.3%), prolonged labour (20%), prolonged rupture of membranes(16.7%) antepartum haemorrhage (13.3%), severe anemia (10%), eclampsia (8.3%), premature rupture of membrane(6.6%), obstructed labour (5%).In many of the cases more than one risk factor was associated.(Table 1).

TABLE 1: SHOWING VARIOUS MATERNO-FETAL RISK FACTORS

NO ANTENATAL CHECKUPS	50%(60)
HOME DELIVERY	40%(48)
FETAL DISTRESS	25%(30)
MECONIUM STAINED LIQUOR	23.3%(28)
PROLONGED LABOUR	20% (24)
PROLONGED RUPTURE OF MEMB	16.7%(20)
ANTEPARTUM HAEMORRHAGE	13.3%(16)
SEVERE ANEMIA	10%(12)
ECLEMPSIA	8.3%(10)
PREMATURE RUPTURE	6.6%(8)
OF MEMBRANE	
OBSTRUCTED LABOUR	5%(6)

Of the total 120 asphyxiated neonates 80(66.6%) had encephalopathy. As per Sarnat and Sarnat staging 24(20%) were in stage 1, 36(30%) were in stage 2 and 20(16.6%) were in stage 3 of Hypoxic Ischemic Encephalopathy.(Table 2).

TABLE 2: PERCENTAGE OF NEONATES SHOWING ENCEPHALOPATHY AS PER SARNAT & SARNAT STAGING TOTAL NO OF NEONATES SHOWING ENCEPHALOPATHY 80(66.6%)

STAGE 2	30%(36)
STAGE 1	20%(24)
STAGE 3	16.6%(20)

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Other than neurological dysfunction symptoms which were also associated in asphyxiated newborn were feeding difficulties (75%), respiratory distress (25%), meconium aspiration syndrome (13.3%), acute renal Failure (8.3%), apnoea (4.2%). (Table 3).

TABLE 3: CLINICAL FEATURES OF NEONATES WITH PERINATAL ASPHYXIA

FEEDING DIFFICULTIES	90(75%)
RESP DISTRESS	30(25%)
MECONIUM ASPIRATION SYNDROME	16(13.3%)
ACUTE RENAL FAILURE	10(8.3%)
APNOEA	5(4.2%)

DISCUSSION: Perinatal Asphyxia constitutes a potentially lethal entity which needs prompt recognition and management. Thus it is extremely important to determine the role of various obstetric factors in causing Asphyxia in the neonates. In the present study various materno-fetal factors were involved in the asphyxiated neonates.

The most important factor was lack of antenatal visits (50%).Other factors were home delivery(40%), fetal distress (25%), meconium stained liquor (23.3%), prolonged labour (20%), prolonged rupture of membranes (16.7%) antepartum haemorrhage (13.3%), severe anaemia (10%), eclampsia (8.3%), premature rupture of membrane(6.6%), obstructed labour (5%). In many other studies similar association with many maternal and fetal risk factors were observed. Majeed R et al (2007) found in their study that 56% cases of perinatal asphyxia were associated with home delivery and there were 24% cases who had associated prolonged rupture of membrane and 20% had associated non cephalic presentation.[8]

Chandra S et al (1997) in their study found strong association of perinatal asphyxia with breech delivery and prolonged second stage of labour.[9] Singh M et al (1978) also found many risk factors associated with birth asphyxia in their study.[10] Chaturvedi et al reported a higher incidence of asphyxia (38.5%)in caesarian deliveries and attributed it to higher number of un booked cases and high risk indication for caesarian delivery.[11] In our study around 66.6% neonates were found to be showing signs of neonatal encephalopathy as per Sarnat & Sarnat staging. There were around 20% neonates in stage 1, 30% neonates in stage 2 and 16.6% cases in stage 3 of HIE.

There are some more studies which documented matching results Finer et al observed 35% stage1, 50% stage 2 and 155 neonates in stage 3.[12] In our study feeding difficulties (75%), respiratory distress (25%), meconium aspiration syndrome (13.3%), acute renal failure (8.3%), apnoea (4.2%) were the main clinical features observed. Other studies have also found similar results. Batra et al (1987) in their study reported meconium aspiration syndrome and respiratory distress syndrome in neonates having perinatal asphyxia.[14] Perlman et al (1989) in their study of systemic manifestations of asphyxia found renal involvement in 40% cases and CNS in 31% cases.[15] Jayashree et al in their study of renal involvement in perinatal asphyxia observed incidence of renal failure to be 16% in perinatal asphyxia.

CONCLUSION: Perinatal asphyxia continues to be a major killer in neonatal period and associated with marked morbidity. Although many interventions are being taken by the government to promote

the institutional delivery still there is marked scope for improvement. Even if the institutional deliveries are becoming more and more because of cash benefits of Janani Suraksha Yojana and free treatment of mother and of newborn in Janani Shishu Surakha Karyakram still there is lack of antenatal care.

This lack of antenatal care is observed to be the major factor leading to neonates with perinatal asphyxia in our study. Perinatal asphyxia in our study was associated with lack of antenatal care, home deliveries, and prolonged rupture of membrane, fetal distress and severe anaemia. In our study Peri natal asphyxia presented in immediate neonatal period with feeding difficulties, meconium aspiration syndrome and neonatal encephalopathy. So to prevent perinatal asphyxia more and more antenatal cases need to be booked and regular antenatal checkups are needed so that any pregnancy complication can be detected at its earliest and treated timely and adequately.

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