

Effect of Place and Mode of Delivery on Perinatal Asphyxia.

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Abstract:

Background: Perinatal asphyxia (PNA) is one of the most important causes of perinatal mortality and morbidity which can be preventable and manageable. **Objectives:** The purpose of the study was to determinethe effect of place and mode of delivery on perinatal asphyxia and to identify the factors influencing or related to the development of the PNA.**Material and Methods:** This is a cross-sectional study conducted at Department of Pediatrics, ward no- 9 at Rangpur medical college and hospital, Rangpur, Bangladesh from January 2020 to April 2020. Medical records of 1042 neonates admitted to the Department of Pediatricswere selected by a systematic sampling method. The data was analyzed using SPSS version 20.**Result:** Among the neonates, 410 (39%) had perinatal asphyxia. Most of the neonates were admitted in the first 72hours of age. The mean age of the study neonates at admissionwas 2.47 days with SD (± 3 days) and 1.25 (± 0.7 days)for those neonates with PNA. More than half 163 (51.5%) were admitted with stage II PNA. **Conclusion:** The prevalence of perinatal asphyxia in this study was high. The case fatality rate of perinatal asphyxia was also alarmingly high.

Keywords: Effect, Perinatal asphyxia, Birth asphyxia

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I. Introduction

Perinatal asphyxia, neonatal asphyxia or birth asphyxia is a serious clinical problem worldwide and contributesgreatly to neonatal mortality and morbidity^[1]. It is a condition of the fetus or newborn due to failure to breath or breathing poorly leading to decrease oxygen perfusion to various organs^[2]. It happens in 2 to 10 cases per 1000 newborns that are born at term, and more of those that are born prematurely^[3]. It is one of the leading causes of neonatal deaths within first week of life. According to the World Health Organization (WHO), preterm birth accounts for 30% of global neonatal deaths, sepsis or pneumonia for 27%, birth asphyxia for 23%, congenital abnormality for 6%, neonatal tetanus for 4%, diarrhoea for 3%, and other causes for 7% of all neonatal deaths^[4]. Also yearly 4 million deaths occurred due to birth asphyxia, representing 38% of all deaths of children under 5 years of age. In the developing countries 3% of all infants (3.6 millions) suffer from moderate to severe birth asphyxia, of which 23% (840,000) die and approximately the same number develop serious sequelae^[5]. It is strongly associated with 1.1 million intrapartum stillbirths. Those who survive after asphyxia at birth may have chance to develop neurological complications including epilepsy, cerebral palsy and developmental delay^[6]. This creates a great burden for the family, as well as for the society. Since the condition could have been preventable, in a developing country like Bangladesh an urgent need to develop a clearer understanding of pathophysiology and risk factors of birth asphyxia is thus obvious. Various materno-fetal risk factors are involved in PNA. Singh et al had found the association of one or more high risk materno-fetal factors of birth asphyxia^[7]. Various study showed age of mother, inappropriate antenatal care, preeclampsia, intake of diuretics and adrenergic drugs were reported as maternal risk factors. Significant Intrapartum risk factors were home delivery by midwives, breech presentation, prolapsed umbilical cord, cephalopelvic disproportion and fever. Significant Fetal risk factors were oligohydromnios, meconium stained amniotic fluid, pre-mature delivery and low birth weight^[8]. To the best of our knowledge, in Bangladesh there are a very few clinical studies in this direction. Studies primarily based on hospital data, indicate that birth asphyxia is one of the three leading cause of newborn death. The other two being infection (sepsis, pneumonia, diarrhoea and tetanus), and complications of prematurity^[9]. Annual reports of Dhaka Medical College Hospital from 2001 through 2007 showed incidence of birth asphyxia to be from 29% to 36% and mortality among them were around 25% [10,11]. Another study showed incidence of birth asphyxia to be 9.76 per 1000 live birth [12].

II. Objective

The aim of the study was to determine the effect of place and mode of delivery on perinatal asphyxia and to identify the factors influencing or related to the development of the PNA.

III. Methodology

A cross-sectional study was conducted in the department of Pediatrics, ward no- 9 at Rangpur Medical College and Hospital, Rangpur, Bangladesh during the period from January 2020 to April 2020. One thousand and forty two (1042) subjects were selected using a standardized random sampling techniques. Data collected from the patient in a prescribed protocol. All data were analyzed by SPSS statistical tools.

Inclusion Criteria

- Gestational age after viability
- Absence of major congenital malformation
- Multi organs failure in the first 72 hours or convulsion in the first 24 hours of life
- History of delayed cry.

Exclusion Criteria

- Birth weight less than 1000 g pre-maturely
- Anesthesia related Low APGAR score
- Babies with lethal anomalies like hydrops, cyanotic congenital heart defects, congenital or chromosomal anomalies and congenital infections

IV. Result

Among the neonates, 410 (39%) had perinatal asphyxia and the rest 632 (61%) had no perinatal asphyxia. Majority of the study neonates' mothers were aged 20-35. Neonates with perinatal asphyxia, more than half of the mother were from rural area and more than half of the mother of neonates without perinatal asphyxia were from urban area. Most of the neonates were admitted in the first 72hours of age. The mean age of the study neonates at admission was 2.47 days with SD (± 3 days) and 1.25 (± 0.7 days) for those neonates with PNA. Majority of the mothers (60.3%) were multiparous. Almost all mothers (98.5%) had ANC follow-up. Among the mothers of neonates with PNA, 52.1% were from rural area, while 58.3% were multiparous. Of all these neonates, 58.3% were born in tertiary hospitals. Most of the mothers) had normal labor and delivery history

Table 1: Socio-demographic and clinical characteristics of mothers and neonates (n=1042)

Age of mother	Perinatal asphyxia "Yes" (n=410)	Perinatal asphyxia "No" (n=632)
<20	45	63
21-30	195	387
>31	170	182
Residence		
Urban	177	452
Rural	233	210
Age of neonate at admission		
0-72 h	200	406
3-7 days	175	120
>7 days	35	106
Parity		
Nulliparous	172	253
Multipara	238	379
ANC follow-up		
Yes	410	620
No	0	12
Gestational age		
Preterm	78	190
Term	328	410
Post-term	4	32

Figure 1, showing that out of the 1042 study neonates, 60 % which is 625 were male and 40% which is 417 were female.

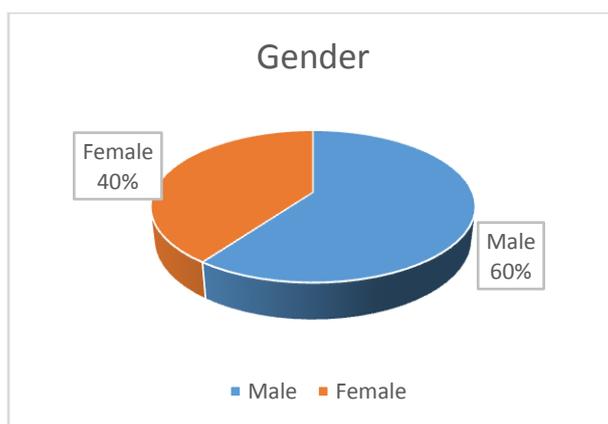


Figure 1 Gender incident

Table 2: Place and mode of delivery

Delivery	Frequency	Percentage (%)
NVD	235	74%
C section	81	25 %
Home delivery	86	27 %
Clinic	118	37%
Govt. hospital	112	35%

Table 3: Clinical status of asphyxiated neonates

More than half 163 (51.5%) were admitted with stage II PNA (Table 3). When we see the outcome of asphyxiated neonates, 56.25% discharged improved, while 37.5% newborns died, resulting in a case fatality rate of 37.5%. From the asphyxiated neonates who died, 61% were stage III, one third of them 33.3% were stage II

Clinical factors	Frequency	Percentage (%)
Perinatal asphyxia		
Yes	410	39%
No	632	61%
Stage of PNA		
Stage 1	135	42.7 %
Stage 2	163	51.5 %
Stage 3	112	35.4 %

V. Discussion

In this study, the prevalence of perinatal asphyxia was found to be 39%, which is higher than in developed countries, the latter of which has reduced it to less than 0.1%. However, similarly high prevalence rate was seen in general hospitals of Tigray, 22.1% [13]. Moreover, it is comparable with the studies done in other African countries like Gusau, Nigeria (21.1%) [14], and Dar es Salaam, Tanzania (21.1%) [15]. This high rate of variation could be due to differences in the methodology, the use of different definitions of birth asphyxia in different settings, the difference in the study facilities, and maybe due to resource disparity or the study participant socioeconomic status. In this study, more males than females were affected by perinatal asphyxia (60%). This is consistent with the report from Bangladesh (60.8%) [16], Dow University of Health Sciences, Karachi (61.3%) [17], and 60.3% in Nigeria [18].

The case fatality rate of perinatal asphyxia was 37.5%. This is comparable with the study conducted in Sri Lanka which was 40.6% [19]. The disparity could be attributable to the difference in hospital setup (some may be better equipped) and the difference in health care provider skills and birth asphyxia severity. Although this study has reported high fatality rate, perinatal asphyxia has contributed to a low overall neonatal mortality rate which is lower than what has been reported in other studies.

The odds of developing perinatal asphyxia was 5.19 times higher in a newborn whose mother had prolonged duration of labor. This is consistent with reports from different hospitals in Ethiopia including general hospitals in Tigray, Dessie, and Dire Dawa [20, 21]

VI. Conclusion

In conclusion, the prevalence of perinatal asphyxia in this study was high. The case fatality rate of perinatal asphyxia was also alarmingly high. Prolonged labor and preeclampsia were predictors of perinatal asphyxia. Early detection and intervention of high-risk mothers should be carried out by health care providers, and mothers should be monitored with partograph during labor. Therefore, efforts should be made to improve the quality of intra-partum care services in order to prevent prolonged labor and fetal complications, and to identify and make a strict follow-up of mothers with meconium-stained amniotic fluid.

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