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Perinatal factores associated with birth asphyxia among neonates at selected hospital's at sriganganagar (Rajasthan)

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Abstract
Background of the study: The World Health Organisation (WHO) says that birth asphyxia is the failure to start and keep breathing during delivery. A five-minute Apgar score of less than 7 may also be a sign of this. It is a significant cause of death in newborns, accounting for 24% of all neonatal fatalities in the world. In Rajasthan, the newborn mortality rate is still high at 25 fatalities per 1,000 live births during the last ten years. Birth asphyxia was responsible for 28.6% of these deaths.
Methodology: This descriptive cross-sectional research was conducted in the neonatal intensive care units (NICUs) of selected hospitals in Sriganga Nagar, a tertiary care institution, from August 1, 2024, to December 1, 2024. Using a successive non-probability sampling procedure with p = 4.8% and d = 3%, 196 asphyxiated patients that satisfied the inclusion or exclusion criteria were chosen. Paper-based questionnaires were used to gather the data.
Results: Neonates born to moms with meconium-stained amniotic fluid were 4.6 times more likely to have neonatal asphyxia compared to those born to mothers with clear amniotic fluid (AOR = 4.55, 95% CI = 2.66-7.80). Deliveries that happened at night had a 1.91 times greater risk of birth asphyxia than those that happened during the day (AOR = 1.91, 95% CI = 1.17-3.13). Additionally, neonates born before to 37 weeks of gestation had a fourfold elevated risk of experiencing birth asphyxia in comparison to those delivered at or after 37 weeks (AOR = 3.96, 95% CI = 1.98-7.89).
Conclusion: This finding aligns with the results of studies conducted in both Ethiopia and Northern Tanzania. A possible explanation is the complications associated with preterm birth, such as respiratory distress syndrome, which occurs due to immature lungs that are unable to maintain adequate oxygenation. This leads to hypoxia, which can result in neurological damage, including conditions like necrotising enterocolitis and cerebral palsy.

Keywords: Perinatal factor's, associated, birth asphyxia, neonates, hospital

Introduction
In 2023, birth asphyxia remained a significant contributor to perinatal deaths in India, though specific 2023 data on this cause is not readily available. Birth asphyxia is a major factor in neonatal and total child death, with India reporting a neonatal mortality rate (NMR) of 17.3 per 1,000 live births in 2023. Where asphyxia ranks alongside prematurity, low birth weight, and infections as leading causes. Infants affected by birth asphyxia face a heightened risk of long-term neurological impairments, including deficits in social behavior, language, and motor skills [2]. While interventions such as promoting maternal birth preparedness, ensuring skilled attendance at birth, providing essential newborn care, offering comprehensive obstetric services, and neonatal resuscitation have been adopted into maternity care guidelines, the persistently high newborn death rate highlights the need for targeted, locally tailored strategies [3]. In low-income and post-conflict settings, delayed access to emergency obstetric and newborn care significantly drives stillbirths and neonatal mortality, with maternal infections like nonspecific fever and placental malaria recognised as risk factors for newborn asphyxia [4]. These infections, together with problems that happen during labour, such pre-eclampsia, prolonged and obstructed labour, malpresentation, inducement of labour, or meconium-stained amniotic liquid, may make it harder for the placenta to exchange gases. This can cause foetal hypoxia and, in the end, birth asphyxia [5]

Need of the study: Birth asphyxia is a major cause of death and illness in newborns in

underdeveloped countries, with rates of 100 to 250 per 1,000 live births, compared to 5 to 10 per 1,000 in industrialised countries. It is still a significant cause of death and bad developmental consequences. Infections (35%), premature births (28%), or birth asphyxia (23%) are the main causes of newborn fatalities in the world [6]. In many developing regions, a substantial number of deliveries occur at home, making it challenging to accurately estimate the true burden of the condition. The issue is particularly severe in countries like Pakistan, which, along with nine other developing nations, accounts for two-thirds of global neonatal mortality. Pakistan witnesses over 5 million births annually, with almost 0.45 million kids dying before they turn one, almost half of them within the first month of life. In Rajasthan, India, the newborn mortality rate (NMR) was 25 deaths per 1,000 live births in 2019.

Aims of the study

The research aimed to identify the perinatal variables linked to birth asphyxia in neonates at designated hospitals in Sri Ganganagar, Rajasthan.

Objectives of the study

- To determine the antepartum risk factors associated with perinatal asphyxia among neonates at selected hospitals at Sri Ganganagar (Rajasthan).
- To determine the neonatal factors associated with perinatal asphyxia among neonates at selected hospitals at Sri Ganganagar (Rajasthan)

Research Hypotheses

- There is statistically significant association between antepartum factors and perinatal asphyxia among neonates at selected hospitals at Sri Ganganagar (Rajasthan).
- There is statistically significant association between neonatal factors and perinatal asphyxia among neo selected hospitals at Sri Ganganagar (Rajasthan).

Methodology

This descriptive cross-sectional research was conducted in the neonatal intensive care unit (NICU) of a designated private tertiary care hospital in Sriganga Nagar from August 1, 2024, to December 1, 2024. A total of 196 asphyxiated patients that satisfied the criteria for inclusion and exclusion were chosen using p = 4.8% and d = 3% using a successive non-probability selection procedure.

Inclusion criteria: Neonates diagnosed with perinatal asphyxia who met at least two of the following criteria and were admitted to the NICU within 6 hours of birth: a first cry delayed by 5 minutes, an Apgar score at 5 minutes of less than 5 that did not improve to more than 7/10 at 20 minutes, or post-asphyxial seizures occurring within the first 48 hours after birth.

Exclusion criteria: Neonates with significant congenital malformations involving the central nervous, cardiovascular, or respiratory systems; dysmorphic characteristics; those born via lower segment caesarean section (LSCS) to mothers who underwent general anaesthesia; term intrauterine growth restriction (IUGR) infants weighing less than 1.5 kg; preterm deliveries; central nervous system encephalopathy from various aetiologies (infectious or metabolic); and all outdoor deliveries.

Six trained research assistants (nurses/midwives) gathered the data. They had both theoretical and practical training on how to assess participants, get informed permission, draw blood, figure out Apgar ratings, and fill out questionnaires. The midwife on duty initially told possible participants about the research. The researcher then got informed permission from the mother for blood drawing (for a full blood count or malaria tests) during admission and blood collection from the cord artery at delivery. Written informed permission was also acquired after delivery to guarantee that individuals comprehended the research well prior to completing the questionnaire.

Result

Table 1: Neonatal Factors of the Newborns (N = 196)

Variable	Frequency (n)	Percentage (%)
Sex of the Newborn		
Female	164	83.67%
Gestational Age at Birth		
GA ≥ 37 weeks (Term birth)	168	85.71%
Birth Weight		
Birth weight ≥ 2500 grams	152	77.55%
Birth Weight for Gestational Age		
Appropriate for gestational age (AGA)	160	81.63%

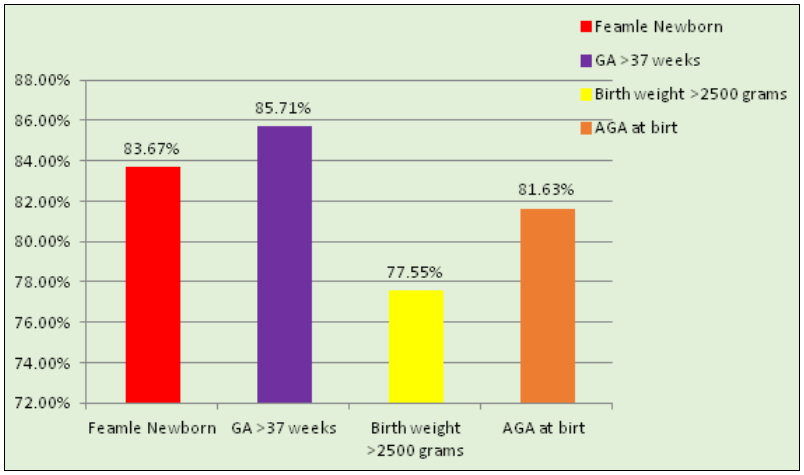

Fig 1: Neonatal Factors of the Newborns

The table no. 1 and figure no. 1 stated that:

- 164 (83.67%) were females
- 168 (85.71%) were delivered at GA ≥ 37 weeks.
- Of the babies, 152 (77.55%) weighed at least 2500 grammes at birth, and the average weight at delivery was 2896.88 grammes.
- Of the neonates born, 160 (81.63%) had a weight at delivery that was suitable for their gestational age.

Proportion of Perinatal Asphyxia

Table 2: Perinatal Asphyxia among Newborns (N = 196)

Variable	Frequency (n)	Percentage (%)
Perinatal Asphyxia (Overall)	168	85.71%
└ 95% Confidence Interval (CI)	—	18.2% - 25.5%
Severity among Asphyxiated Neonates		
Moderate Perinatal Asphyxia	97	57.73% (of 168)
Severe Perinatal Asphyxia	71	42.26% (of 168)

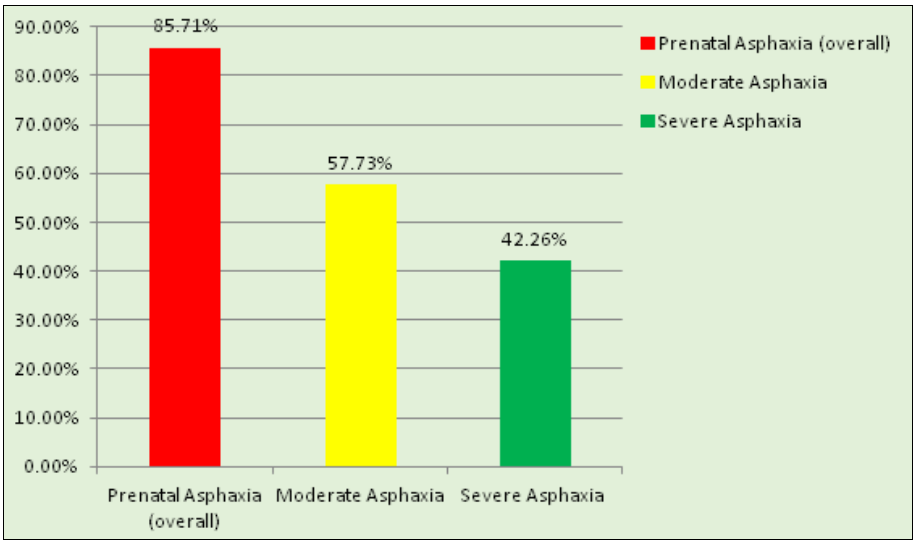

Fig 2: Perinatal Asphyxia among Newborns

The table no. 2 and figure no. 2 revealed that:

- Proportion of perinatal asphyxia was found to be 168 (85.71%) (96% CI: 17.2%-24.5%).
- From asphyxiated neonates, 97 (57.73%) had moderate perinatal asphyxia
- 71 (42.26%) had severe perinatal asphyxia.

Discussion

In this research, the prevalence of perinatal asphyxia to live newborns in private health institutions was 85.71% (95% CI: 18.2-25.5%). This is comparable to the 21.1% reported in a study from Gosau, Nigeria [7], though the proportion here was higher, possibly due to differences in methodology, study settings, and the quality of maternal services. In contrast, the proportion observed was lower than that reported in other general hospital studies (28.3%) [8], which may be because the present research included both health centers and hospitals, whereas those studies were conducted exclusively at the hospital level—where more complicated cases, such as perinatal asphyxia, are more common, as seen in the Giri Hospital study. However, the proportion in the current study exceeded that reported in Jimma Zone public hospitals (12.5%), likely due to setting differences, since the Jimma Zone study included both health centers and hospitals, while the present study was conducted solely in hospitals.

Intrapartum and foetal variables shown a substantial correlation with perinatal asphyxia. Neonates born in malpresentation were 4.1 times odds to acquire the disease [9]. This finding is consistent with studies from Debre Tabor General Hospital, a referral facility, and Jimma Zone public hospitals [10]. A plausible explanation is that malpresentation, such as breech delivery, heightens the risk of delivery-related trauma, fetopelvic disproportion that can cause prolonged labor, and cord prolapse—all of which increase the risk of perinatal asphyxia [11].

Conclusion

Babies born at night were 1.91 times more likely to have perinatal asphyxia, which is consistent with what Debre Tabor General Hospital found. This may be attributed to fewer healthcare providers being available to monitor laboring mothers and attend deliveries at night, resulting in a higher workload during these hours [13]. The increased risk could also be linked to longer decision-to-delivery intervals for emergency cesarean sections at night compared to daytime [14]. Additionally, delays in the arrival of senior consultants for complicated labor cases during nighttime hours may contribute to this outcome.

Preterm newborns had a fourfold increased likelihood of developing perinatal hypoxia in comparison to those delivered at ≥37 weeks. This discovery aligns with research conducted by Nishant Yadav and Sachin Damke at the Datta Meghe Institute of Medical Sciences, Sawangi, Maharashtra, India. A probable explanation is that preterm births are frequently associated with respiratory distress syndrome caused by immature lungs incapable of sustaining adequate oxygenation, which can lead to hypoxia and subsequent neurological complications such as cerebral palsy and necrotizing enterocolitis.

Conflict of Interest

The authors affirm that they own no links or involvement with any organisation or institution that has financial or non-financial interests in the subject matter or materials discussed in this study.

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Referances

1. Lawn JE, Lee ACC, Kinney M, *et al*. Two million intrapartum-related stillbirths and neonatal deaths: Where, why, and what can be done? Int J Gynecol Obst. 2009;107(Suppl 1):S5-18.
2. Geva A, Gray J. A Quantitative Analysis of Optimal Treatment Capacity for Perinatal Asphyxia. Med Decis Making. 2012;32(2):266-72.
3. Ariff S, Soofi SB, Sadiq K, *et al*. Evaluation of health workforce competence in maternal and neonatal issues in public health sector of Pakistan: an assessment of their training needs. BMC Health Serv Res. 2010;10:319.
4. Afza MF, Anjum A, Sultan MA. Risk factors analysis in asphyxiated newborns and their outcome in relation to stage of hypoxic ischemic encephalopathy. Pakistan Ped J. 2007;31:63-8.
5. Majeed R, Memon Y, Majeed F, *et al*. Risk factor of birth asphyxia. J Ayub Med Coll Abbottabad. 2007;19(3):67-71.
6. Butt TK, Farooqui R, Khan MA. Risk factors for hypoxic encephlopathy in children. J Coll Physicians Surg Pak. 2008;18(7):428-32.
7. American College of Obstetricians and Gynecologists; American Academy of Pediatrics. Neonatal encephalopathy and cerebral palsy: Defining the pathogenesis and pathophysiology. Washington (DC): 2003.
8. American Heart Association/American Academy of Pediatrics. Textbook of Neonatal Resuscitation. 4th ed. Elk Grove Village (IL): American Academy of Pediatrics; 2000.
9. Lawn JE, Cousens S, Zupan J, *et al*. 4 million neonatal deaths: when? Where? Why? Lancet. 2005;365(9462):891-900.
10. Baqui AH, Darmstadt GL, Williams EK, *et al*. Rates, timing and causes of neonatal deaths in rural India: implications for neonatal health programmes. Bull World Health Organ. 2006;84(9):706-13.
11. Chishty AL, Iqbal MA, Anjum A, Maqbool S. Risk factors analysis of birth asphyxia at the children's hospital Lahore. Pak Paed J. 2002;26:47-53.
12. Ibrahim S, Parkash J. Birth asphyxia-analysis of 235 cases. J Pak Med Assoc. 2002;52(12):553-6.
13. Zulfiqar R, Naeemullah S. Severity of hypoxic ischaemic encephalopathy in neonates with birth asphyxia. J Rawal Med Coll. 2007;11:18-22.
14. Milsom I, Ladfars L, Thiringer K, *et al*. Influence of maternal, obstetric and fetal risk factors on the prevalence of birth asphyxia at termin, a Swedish urban population. Acta Obstet Gynecol Scand. 2002;81(10):909-13.
15. Apgar V. A proposal for a new method of evaluation of the newborn infant. Curr Res Anesth Analg. 1953;32(4):260-7.

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