



Frequency of Fetal Birth Asphyxia in Prolonged Second Stage of Labour

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ABSTRACT

Introduction: Prolonged second stage of labour is a recognized risk factor for adverse maternal and neonatal outcomes, including fetal birth asphyxia. Timely identification and management are essential to minimize perinatal morbidity and mortality. **Objective:** To establish the prevalence of asphyxia in the fetus during the extended second stage of labour. **Materials and Methods:** This cross-sectional study was carried out in the Obstetrics and Gynecology Department, Sheikh Zayed Woman Hospital, Larkana, between January, 2025 and May 2025. One hundred women aged 18–40 years with gestational age >32 weeks and prolonged second-stage labour were randomly selected. Neonates were evaluated for birth asphyxia using Apgar scores, muscle tone, and enzyme markers (CPK, LDH). Data analysis was conducted using SPSS v. 26. **Results:** The prevalence of fetal birth asphyxia was 18%. It was significantly associated with unbooked status, maternal anemia, hypertension, low Bishop scores, and a second stage >4 hours. Asphyxiated neonates required NICU admission in 72.2% of cases. **Conclusion:** Prolonged second-stage labour increases the risk of fetal birth asphyxia. Enhanced prenatal care and timely intrapartum management can reduce adverse neonatal outcomes.

INTRODUCTION

The second phase of labour, spanning complete cervical dilation to delivery, includes passive and active (expulsive) phases (1). While labour is a physiological process, its duration varies widely. Prolonged second-stage labour has raised clinical concerns due to its association with adverse maternal and neonatal outcomes (2). The second stage becomes risky when excessively prolonged, with most guidelines suggesting evaluation after three hours, particularly in nulliparous women with epidural analgesia (3). Birth asphyxia, a leading cause of neonatal morbidity and mortality globally, is characterized by hypoxia and hypercapnia, evidenced by low Apgar scores, flaccid tone, and elevated enzyme levels (CPK, LDH) (2). A systematic review in Ethiopia reported 22.5% of neonatal deaths linked to asphyxia, emphasizing the need for prevention and early diagnosis (2).

Global studies highlight the impact of prolonged second-stage labour. A French study showed extended active second-stage labour correlates with lower Apgar scores and increased NICU admissions (3). In Uganda, a 15% prevalence of birth asphyxia was noted in term singleton births, with prolonged second stage as a key factor (4). An

American study in birth centers linked prolonged second stage to neonatal complications, even in low-intervention settings (5). A Swedish study associated prolonged second stage with increased cesarean rates, which may elevate asphyxia risk in emergency settings (6). Additional risk factors include maternal anemia, prolonged labour, and fetal distress, as noted in Turkish and Ethiopian studies (7, 8). In Pakistan, hypertension and slow labour progression were linked to asphyxiated births (9).

A Nepalese study reported a 20% asphyxia rate in infants born after a second stage exceeding two hours, particularly in primigravidae (10). Studies in Addis Ababa and Nigeria confirmed associations with unbooked status, intrapartum complications, and prolonged second stage (11, 12). In Ethiopia, delays in labour progress and poor monitoring were strongly linked to asphyxia (13). A Zambian preprint study reinforced these findings (14). Prolonged second stage also increases operative delivery risks, with Israeli and Nigerian studies noting higher neonatal trauma and hypoxic injury in cesarean deliveries during prolonged labour (15, 17). An Iranian study found an inverse correlation between second-stage duration and Apgar scores in primipara women (20).

Despite global evidence, local data in Pakistan on fetal birth asphyxia related to prolonged second-stage labour is limited. This study addresses this gap, considering local health infrastructure and maternal health conditions.

Objective

To establish the prevalence rate of fetal birth asphyxia in women with prolonged second stage of labour at the Obstetrics & Gynecology Department, Sheikh Zayed Woman Hospital, Larkana.

MATERIALS AND METHODS

Study Design: Cross-sectional study.

Study Setting: Obstetrics & Gynecology Department, Sheikh Zayed Woman Hospital, Larkana, Pakistan.

Duration: January, 2025 to May 2025.

Inclusion Criteria: Women aged 18–40 years, gestational age >32 weeks, in active labour with a second stage >3 hours, and parity <5.

Exclusion Criteria: Excluded were women with multiple pregnancies, stillbirths, abnormal placental placement, macrosomia (>4 kg), meconium-stained liquor, intrauterine growth retardation, induced or obstructed labour to minimize confounding factors.

Methods

One hundred women meeting inclusion criteria were recruited via non-probability consecutive sampling after ethics clearance from the institutional review board and CPSP. Informed consent was obtained. Baseline data included age, BMI, parity, gestational age, booking status, and medical history (gestational diabetes, hypertension, anemia). Labour parameters (first-stage duration, cervical dilation, Bishop score) were recorded. Second-stage duration was documented. Birth asphyxia was assessed using Apgar scores <7 at 1 and 5 minutes, abnormal muscle tone (flaccid or tight), and elevated enzyme levels (CPK >500 U/L, LDH >1000 U/L). Asphyxiated neonates were managed per standard protocols. Data were analyzed in SPSS v. 26 using chi-square tests for categorical variables and t-tests for continuous variables, with a p-value <0.05 considered significant.

RESULTS

One hundred women with prolonged second-stage labour were studied. Participants had a mean age of 28.7 ± 5.1 years and gestational age of 38.2 ± 1.4 weeks. Fetal birth asphyxia was observed in 18 cases (18%), based on Apgar scores <7, abnormal tone, and elevated CPK/LDH levels. Table 1 summarizes demographic and clinical profiles.

Table 1

Demographic and Clinical Profile of Participants

Variable	Frequency (%)
Age (Mean \pm SD)	28.7 ± 5.1 years
Gestational Age >37 weeks	89 (89%)
Parity <2	62 (62%)
Booking Status (Unbooked)	64 (64%)
Gestational Diabetes	12 (12%)
Gestational Hypertension	18 (18%)
Anemia (Hb <11 g/dL)	36 (36%)

Labour characteristics included a mean first-stage duration of 10.3 ± 1.9 hours, cervical dilation of 6.2 ± 1.3

cm, and Bishop Score of 5.6 ± 1.4 . The mean second-stage duration was 3.7 ± 0.4 hours. Table 2 shows labour characteristics associated with asphyxia.

Table 2

Labour Characteristics and Birth Asphyxia

Variable	Birth Asphyxia (n=18)	No Asphyxia (n=82)	p-value
Second stage >4 hours	12 (66.7%)	18 (21.9%)	0.001
Bishop score <5	11 (61.1%)	20 (24.4%)	0.003
Cervical dilation <6 cm	10 (55.6%)	17 (20.7%)	0.005

Neonatal outcomes are presented in Table 3. Mean birth weight was 2.9 ± 0.5 kg. Among asphyxiated neonates, 72.2% required NICU admission, and 22.2% showed hypoxic-ischemic encephalopathy (HIE) symptoms. No neonatal deaths occurred.

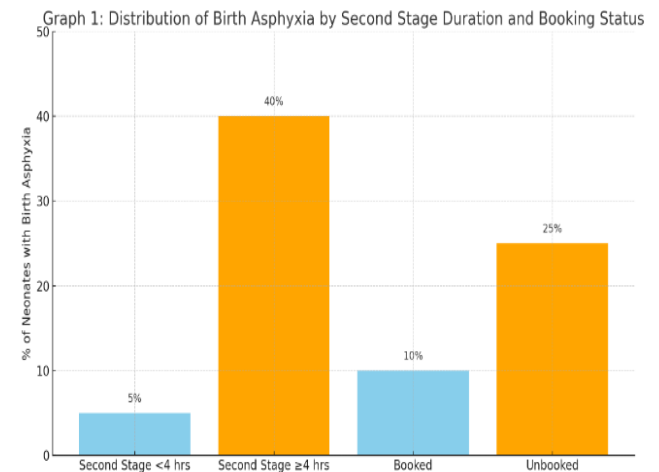
Table 3

Neonatal Outcomes

Outcome	Birth Asphyxia Group (n=18)
Mean Birth Weight (kg)	2.8 ± 0.6
Apgar Score <7 at 1 min	18 (100%)
Apgar Score <7 at 5 min	14 (77.8%)
NICU Admission	13 (72.2%)
HIE Symptoms	4 (22.2%)
Neonatal Mortality	0 (0%)

Graph 1

Distribution of Birth Asphyxia by Second Stage Duration and Booking Status



Bar graph showing the proportion of neonates with birth asphyxia stratified by second-stage duration (>4 hours vs. \leq 4 hours) and maternal booking status (booked vs. unbooked). Higher asphyxia rates are observed in unbooked mothers with second stage >4 hours.

Table 4

Stratified Analysis of Risk Factors for Birth Asphyxia

Variable	Asphyxia Present (%)	p-value
Unbooked mothers	14/64 (21.9%)	0.021
Anemic mothers	9/36 (25.0%)	0.037
Gest. hypertension	6/18 (33.3%)	0.008
Bishop score <5	11/31 (35.5%)	0.003

These results confirm significant associations between prolonged second-stage labour, unbooked status, maternal anemia, hypertension, and low Bishop score with fetal birth asphyxia.

DISCUSSION

This study found an 18% prevalence of fetal birth asphyxia in prolonged second-stage labour, consistent with global studies (Young et al., 1; Ahmed et al., 2). Prolonged labour induces fetal stress, leading to hypoxia, as supported by Blanc-Petitjean et al., who noted umbilical cord compression and reduced placental perfusion in extended second stages (3). Over 66% of asphyxiated neonates experienced a second stage >4 hours, aligning with Ayebare et al.'s findings in Uganda (4). Maternal comorbidities (anemia, hypertension) and unbooked status were significant risk factors, corroborating Lundborg et al. (6) and Tunç et al. (7). Low Bishop scores and poor cervical dilation also increased asphyxia risk, consistent with Kumsa et al. (8).

In Pakistan, Bibi et al. (9) reported similar risks tied to maternal preparation and monitoring. Studies in Nepal and Addis Ababa (Sunny et al., 10; Molla et al., 11) echoed higher asphyxia rates in unbooked cases. The 72.2% NICU admission rate and 22.2% HIE incidence among asphyxiated neonates align with Ikechebelu et al. (12) and Bayih et al. (13). Unbooked status as a risk factor supports Ngongo et al. (14). Operative deliveries during prolonged

second stage, as noted by Sapir et al. (15) and Gimovsky et al. (19), increase neonatal trauma risks. Torabifar et al. (20) confirmed lower Apgar scores with prolonged second stage.

The findings underscore the need for timely monitoring and intervention. Improved antenatal care and early identification of labour complications can mitigate asphyxia risks. Further multi-center studies in resource-constrained settings are recommended.

CONCLUSION

This study confirms a high correlation between prolonged second-stage labour and fetal birth asphyxia (18% prevalence). Unbooked status, maternal anemia, hypertension, low Bishop scores, and slow cervical dilation were key risk factors. Asphyxiated neonates faced higher NICU admissions and HIE symptoms. Enhanced antenatal care, early complication detection, and timely interventions are critical to reducing neonatal morbidity. Protocol-driven management of prolonged second-stage labour in local settings can improve outcomes. Larger-scale studies are needed for validation.

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