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A Study of Etiological Analysis of Prolonged Labour and its Maternal & Fetal Outcome in Sir Salimullah Medical College & Mitford Hospital, Dhaka

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Abstract

Background: Prolonged labour remains a significant contributor to maternal and perinatal morbidity and mortality in Bangladesh. Delayed recognition and referral often lead to adverse outcomes. This study was undertaken to analyze the etiological factors of prolonged labour and evaluate its maternal and fetal outcomes. ***Methods:*** This descriptive cross-sectional study was conducted in the Department of Obstetrics and Gynecology, Sir Salimullah Medical College & Mitford Hospital, Dhaka, from June to December 2009. A total of 110 purposively selected pregnant women with prolonged labour (labour pain >18 hours) were enrolled. Data were collected through interviews, clinical examination, and record review. ***Results:*** The majority of patients were primigravida (62.7%) and aged 21–30 years (57.27%). Most had no ANC (60%) and belonged to low socioeconomic backgrounds (69.09%). Uterine hypotonicity was the leading cause (45%), followed by malposition (22.72%). Caesarean section was required in 60.50% of cases. Maternal complications occurred in 65%, with PPH (20%) and puerperal sepsis (14.54%) being most common. Perinatal complications included asphyxia (13.63%), umbilical sepsis (10%), and stillbirth (6.36%). Barriers to early hospital admission included reliance on midwives (31%), TBAs (18.18%), and poor economic conditions (20%). ***Conclusion:*** Prolonged labour is associated with substantial maternal and perinatal morbidity. Strengthening ANC, improving referral systems, training birth attendants, and ensuring timely access to emergency obstetric care are essential to improve outcomes.

Keywords: Prolonged labour, etiological factors, maternal outcome, fetal outcome.

INTRODUCTION

Safe motherhood remains a major public health concern throughout the world, particularly in developing countries where access to quality maternal healthcare services is often limited.[1] Pregnancy and childbirth are natural physiological processes, yet they carry significant risks for both the mother and the fetus. Despite remarkable advances in obstetric care, maternal and neonatal morbidity and mortality continue to be major challenges.[2] A substantial proportion of these adverse outcomes are attributable to complications arising during labour and delivery, many of which are preventable through timely and appropriate medical intervention.[3]

Prolonged labour is one of the most important obstetric complications associated with adverse maternal and fetal outcomes.[4] It is generally defined as labour that exceeds the expected duration due to abnormalities in the powers, passenger, or passage.[5] Prolonged labour may result from ineffective uterine contractions, cephalopelvic disproportion, malpresentation, malposition, or other mechanical and functional factors.[6] If not recognized and managed promptly, prolonged labour can lead to serious complications such as maternal exhaustion, dehydration, postpartum hemorrhage, puerperal sepsis, uterine rupture, and obstetric fistula. The fetus may also suffer from birth

asphyxia, neonatal sepsis, birth trauma, and even perinatal death.[7]

In many developing countries, a considerable number of deliveries still occur at home under the supervision of untrained or inadequately trained birth attendants.[8] Lack of antenatal care, poor socioeconomic conditions, ignorance regarding danger signs of labour, transportation difficulties, and delayed referral to healthcare facilities often contribute to prolonged and neglected labour.[9] As a result, women frequently arrive at hospitals after many hours of ineffective labour, often in a compromised physical condition, thereby increasing the risk of maternal and neonatal complications.[10]

Prolonged labour continues to be a significant contributor to maternal and perinatal morbidity and mortality.[11] Understanding its etiological factors and associated outcomes is essential for improving obstetric care and reducing preventable complications. Identification of the common causes of prolonged labour can facilitate early diagnosis, timely referral, and appropriate management strategies.[12]

Sir Salimullah Medical College Mitford Hospital receives a large number of obstetric patients, including many cases of prolonged and neglected labour. Clinical observations suggest that these patients often experience unfavorable maternal and fetal outcomes. Therefore, this study was undertaken to analyze the etiological factors responsible for prolonged labour and to evaluate its maternal and fetal outcomes. The findings of this study may contribute to a better understanding of the problem and help formulate measures for improving maternal and neonatal health outcomes.

METHODOLOGY & MATERIALS

This descriptive cross-sectional study was conducted in the Department of Obstetrics and Gynecology, Sir Salimullah Medical College Mitford Hospital, Dhaka, over a six-month period from June 2009 to December 2009. A total of 110 purposively selected pregnant women admitted with prolonged labour were included in the study. Both primigravida and multigravida women experiencing labour pain lasting more than 18 hours, considering the combined duration of the first and second stages of labour, were enrolled.

Data were collected using a predesigned and structured questionnaire through direct interviews, clinical examination, and review of hospital records. Detailed obstetric history was obtained with particular emphasis on the duration of labour pain and any history of trial of labour at home before hospital admission. Clinical examinations were performed to identify the etiological factors responsible for prolonged labour and to assess maternal and fetal conditions. The diagnosis of prolonged labour was established based on clinical findings, and fetal wellbeing was evaluated throughout labour. Patients were followed up daily until discharge to document the mode of delivery, intranatal and postnatal management, maternal complications, and fetal outcomes.

The inclusion criteria were pregnant women who provided written informed consent, were willing to participate in the study, had labour pain lasting more than 12 hours before arrival at the hospital, had a history of trial of labour at home for a variable duration, and were diagnosed with prolonged labour. Exclusion criteria included pregnant women with associated obstetric or medical complications such as diabetes mellitus, hypertension, antepartum hemorrhage, and heart disease. Collected data were checked, compiled, and analyzed to determine the etiological factors of prolonged labour and their maternal and fetal outcomes.

RESULTS

Table 1: Patient Profile According to Gestational Age and Gravida (n=110)

Factors	Category	Number of Patients	Percentage
Maternal Age	Below 20 years	27	24.50%
	21–30 years	63	57.27%
	31–40 years	20	18.18%
Parity	Primi	69	62.70%
	Multi	41	37.20%

Table 1 presents the distribution of patients according to maternal age and parity among the 110 women with prolonged labour included in this study. The majority of patients (57.27%, n=63) belonged to the 21–30 years age group, followed by 24.5% (n=27) below 20 years and 18.18% (n=20) in the 31–40 years category. Regarding parity, primigravida women constituted the majority (62.7%, n=69), while multigravida accounted for 37.2% (n=41) of cases.

Table 2: Patient Profile According to ANC and Immunization Status (n=110)

Factors	Category	Number of Patients	Percentage
ANC Status	Regular	17	15.45%
	Irregular	26	23.60%
	No ANC	67	60%
Immunization (TT)	Yes	78	78.90%
	No	22	20%

Table 2 illustrates the antenatal care (ANC) and tetanus toxoid (TT) immunization status of the study participants. Among the 110 women, only 15.45% (n=17) had received regular ANC, while the majority (60%, n=67) had no ANC at all, and 23.6% (n=26) had irregular attendance. Regarding tetanus toxoid immunization, 78.9% (n=78) of patients were immunized, whereas 20% (n=22) remained unimmunized.

Table 3: Associated Socio-economic Factors (n=110)

Factors	Category	Number of Patients	Percentage
Education of Patients	No education	52	47.27%
	Primary	46	41.80%
	Secondary	8	7.20%
	Higher	4	3.60%
Occupation	Housewife	96	87.20%
	Service	14	10.27%
Socioeconomic Condition	Below average	76	69.09%
	Average Middle	26	23.63%
	High	8	7.27%

Table 3 demonstrates the socioeconomic profile of the study participants. Regarding education, the majority of patients had no formal education (47.27%, n=52), followed by primary education (41.8%, n=46), while only 3.6% (n=4) had attained higher education. In terms of occupation, the vast majority (87.2%, n=96) were housewives, with only 10.27% (n=14) engaged in service. Socioeconomically, most patients belonged to the below average group (69.09%, n=76), while 23.63% (n=26) were in the average middle category and only 7.27% (n=8) were from high socioeconomic backgrounds.

Table 4: Clinical Status of the Patients (n=110)

Factors	Category	Number of Patients	Percentage
Labour Pain Duration	13–24 hours	38	34.50%
	25–48 hours	56	50.90%
	49 or more hours	16	14.54%
Ruptured Membrane Duration	Up to 12 hours	19	16.96%
	13–24 hours	17	15.17%
	25–48 hours	12	10.71%
	49 or more hours	6	5.30%
Dehydration	Present	41	37.20%
	Absent	69	62.70%
Temperature	Normal	79	70.53%
	Raised	33	29.46%
Fetal Condition	Distress	62	56.36%
	Normal	48	43.63%
Attended By	Dai (Traditional birth attendant)	81	72.32%
	Relatives	31	27.67%
H/O IM/IV Oxytocin Use	Yes	28	25%

Table 4 presents the clinical status of patients on admission. Regarding labour duration, 50.9% (n=56) had labour pain for 25–48 hours, while 14.54% (n=16) had pain for 49 hours or more. Membranes were ruptured for more than 24 hours in 15.17% (n=17) of cases. Dehydration was present in 37.2% (n=41) of patients, and 29.46% (n=33) had raised temperature, indicating infection. The majority of patients (72.32%, n=81) were attended by traditional birth attendants (dais), and 25% (n=28) had a history of receiving intramuscular or intravenous oxytocin injection before admission.

Notably, more than half of the fetuses (56.36%, n=62) were in distress at the time of presentation.

Table 5: Causes of Prolonged Labour (n=110)

Causes	Number of Patients	Percentage
Uterine Hypotonicity		
Primi	38	34.54%
Multi	13	11.81%
Subtotal (Uterine Hypotonicity)	51	45%
Malposition (Occiput-posterior, Occiput-transverse)	25	22.72%
Cephalopelvic Disproportion (CPD)	11	10%
Malpresentation	4	3.63%
Cervical Dystocia	11	10%
Unknown	8	7.27%

Table 5 illustrates the etiological factors responsible for prolonged labour in the study population. Uterine hypotonicity was the most common cause, accounting for 45% (n=51) of cases, with primigravida contributing 34.54% (n=38) and multigravida 11.81% (n=13). Malposition, including occiput-posterior and occiput-transverse positions, was found in 22.72% (n=25) of patients. Cephalopelvic disproportion and cervical dystocia each accounted for 10% (n=11) of cases, while malpresentation was observed in only 3.63% (n=4). The cause remained unknown in 7.27% (n=8) of patients.

Table 6: Mode of Delivery (n=110)

Mode of Delivery	Number of Patients	Percentage
Vaginal	32	29%
Forceps	5	4.23%
Ventouse (Vacuum)	9	8.12%
Caesarean Section	66	60.50%
Laparotomy for Ruptured Uterus	0	0%

Table 6 demonstrates the mode of delivery among the 110 patients with prolonged labour. The majority of patients (60.50%, n=66) required caesarean section for safe delivery, reflecting the high rate of obstetric complications necessitating surgical intervention. Assisted vaginal deliveries, including forceps (4.23%, n=5) and ventouse (8.12%, n=9), accounted for 12.35% of cases. Normal vaginal delivery was achieved in only 29% (n=32) of patients. Notably, no case of laparotomy for ruptured uterus was recorded during the study period.

Table 7: Fetal Outcome – APGAR Score (n=110)

APGAR Score	Number of Patients	Percentage
1 Minute < 7	30	27.27%
1 Minute > 7	67	59.82%
5 Minutes > 7	91	81.25%

Table 7 presents the fetal outcome assessed by APGAR scoring at 1 and 5 minutes after birth. At 1 minute, 27.27% (n=30) of newborns had an APGAR score below 7, indicating some degree of birth asphyxia requiring immediate resuscitation, while 59.82% (n=67) had a score above 7. By 5 minutes, the condition of most neonates improved significantly, with 81.25% (n=91) achieving an APGAR score above 7. This improvement reflects the effectiveness of resuscitative measures and the ability of most neonates to recover from initial birth depression following prolonged labour.

Table 8: Perinatal Outcome (n=110)

Perinatal Outcome	Number of Patients	Percentage
Stillborn	7	6.36%
Asphyxia	15	13.63%
Umbilical Sepsis	11	10%
Jaundice	8	7.27%
Healthy Baby	59	53.63%

Table 8 illustrates the perinatal outcomes among the 110 newborns delivered following prolonged labour. Healthy babies were delivered in 53.63% (n=59) of cases. Among the complications, birth asphyxia was the most common, occurring in 13.63% (n=15) of neonates, followed by umbilical sepsis in 10% (n=11) and neonatal jaundice in 7.27% (n=8). Stillbirth occurred in 6.36% (n=7) of cases.

Table 9: Maternal Outcome in Prolonged Labour (n=110)

Maternal Complications	Number of Patients	Percentage
PPH (Atonic)	22	20%
Cervical Tear	9	8.18%
Perineal Tear	11	10%
Puerperal Sepsis	16	14.54%
Infection (Wound Dehiscence)	14	12.72%
Ruptured Uterus	1	0.90%
Maternal Death	0	0%

Table 9 presents the maternal complications observed following prolonged labour. Overall, 65% of patients experienced some form of complication. Postpartum hemorrhage (atonic) was the most common complication, occurring in 20% (n=22) of cases, followed by puerperal sepsis in 14.54% (n=16) and wound infection/dehiscence in 12.72% (n=14). Perineal tears occurred in 10% (n=11), while cervical tears were noted in 8.18% (n=9). Ruptured uterus was recorded in only 0.9% (n=1) of cases, and no maternal death occurred during the study period.

Table 10: Hindrance for Patients to Come to Hospital (n=110)

Hindrance Factors	Number of Patients	Percentage
Midwife	35	31%
TBA (Traditional Birth Attendant)	20	18.18%
Relatives	17	15.45%
Nurse	8	7.27%
Poor Economic Condition	20	20%

Table 10 identifies the barriers that prevented patients from reaching the hospital early during prolonged labour. The most common hindrance was reliance on midwives, reported by 31% (n=35) of patients, followed by traditional birth attendants (TBA) in 18.18% (n=20) and poor economic conditions in 20% (n=20). Relatives delayed hospital referral in 15.45% (n=17) of cases, while nurses were responsible in 7.27% (n=8).

DISCUSSION

A very small fraction of total population in Bangladesh attend hospital to deliver their babies. Those who are fortunate and mainly reside in urban area can enjoy the benefit of modern medical help from hospitals or maternity centers. Rashid M, commented that only around 6% deliveries in the country takes place in hospitals.[13]

This study aims to find a profile of prolonged labour admitted in the Sir salimullah Medical College and Mitford Hospital (SSMC & MH). The parameters of the study included the standard ones taken by other workers in this field. In addition, few more parameters are also taken which will reflect the socioeconomic problems of Bangladesh and shall affect the pregnancy and its outcome adversely. So this study can only be compared with others as far as standard parameters are concerned, so far the additional socio-condition, it can only be compared with such studies undertaken in the same perspective.

SSCM & MH covers a catchments area of old Dhaka and a big rural area on other sides of the river Burigonga, where there is antenatal programmes for the pregnant women. In this study, only those cases were selected as prolonged labour who were admitted after 12 hours or more in duration of labour pain and those who had trial of labour at home for variable period.

Age incidence of this study is more or less similar, with another study: some of the elderly patients (30 years and above) had prolonged labour, Donald, reported prolonged labour in about 25% of the elderly patients, where 35 years has been taken as a cutoff age for elderly patients. [6,14] High incidence of prolonged labour is found of primigravida (62.7%). Prolonged labour is said to be four times more common in primigraveda than multigravida as reported in Fundamental Obstetrics and Gynecology. According to Holland and Brews, first labour is more prolonged than subsequent ones. [15] The high incidence of rupture at the time of admission was due to early interference by traditional birth attendants (TBA) and by midwives. 56.36% of prolonged labour cases had fetal distress. [16]

In the present study, 22.72% of cases presented with occipitoposterior position. Regarding the mode of

delivery, 29.23% of women delivered spontaneously with vertex presentation, while 12.7% required assisted vaginal delivery using forceps or ventouse. Caesarean section was performed in 60.23% of cases, indicating a high operative delivery rate among women with prolonged labour. This high caesarean section rate may be attributed to the fact that the study was conducted in a tertiary referral hospital where many patients were admitted after prolonged and complicated labour, often following delayed referral from peripheral healthcare facilities.

Analysis of the etiological factors revealed that abnormal uterine action was the most common cause of prolonged labour, accounting for 45% of cases. Occipitoposterior position was identified in 22% of cases, while contracted pelvis and cephalopelvic disproportion together accounted for 10% of cases. These findings suggest that abnormalities of uterine contractions and malposition of the fetal head were major contributors to prolonged labour in the study population. The high frequency of abnormal uterine action may be related to delayed hospital admission, prolonged labour at home, and inappropriate early interventions during labour before referral to the hospital.

Our study shows 89.20% patients were housewives without any job outside. 47.32% were illiterate and 41.96% had education up to primary level. 69.09% of the patients came from low socio-economic income group. The hindrance for the patients to come to the hospital early were mid wives in 31%, TBA in18.18% cases, relatives in 15.45% cases and poor economic condition in 20% cases which is more or less similar. As far the complication is concerned, 37.2% of the patients were dehydrated and 29.46% were running temperature, PPH occurred in 20% cases, perineal and cervical tear occurred in 18.8% cases, Wound infection in 12.72% cases. In neonatal outcome 28.57% baby had apgar score <7 in 1 minute and 81.255 had>7 in 5 minutes. Perinatal mortality were 6.36%, asphyxia was found in13.63% cases, infection occurred n 10% and healthy baby delivered 53.63% cases.

The findings of the present study demonstrate that prolonged labour remains an important contributor to maternal and neonatal morbidity. The majority of affected women were from low socioeconomic backgrounds, had limited educational attainment, and were housewives, highlighting the influence of social and economic factors on maternal health outcomes. [17] Delayed referral by traditional birth attendants, midwives, family members, and financial constraints were major barriers to timely access to institutional obstetric care. [18] Abnormal uterine action was identified as the leading cause of prolonged labour, and the high rate of caesarean section reflected the severity of cases admitted to this tertiary care hospital. Maternal complications such as dehydration, fever, postpartum hemorrhage, genital tract injuries, and wound infection were common, indicating the adverse effects of prolonged labour on maternal wellbeing. [19] Neonatal outcomes were also significantly affected, with notable rates of birth asphyxia, infection, low Apgar scores, and perinatal mortality. These findings emphasize the need for improved antenatal care, skilled birth attendance, early recognition of labour abnormalities, timely referral, and accessible emergency obstetric services to reduce the burden of prolonged labour and improve both maternal and neonatal outcomes. [20]

Limitations of the study

The findings of this study should be interpreted in light of certain limitations, including the relatively small sample size of 110 patients, which may not fully represent the broader population, and the single-center design conducted at Sir Salimullah Medical College & Mitford Hospital, limiting the generalizability of results to other healthcare settings across Bangladesh. The six-month study duration was insufficient to capture seasonal variations or long-term trends, while the absence of a control group with normal labour restricted the ability to establish definitive causal relationships between etiological factors and prolonged labour. Additionally, reliance on patient recall for historical data may have introduced recall bias, and purposive sampling could have led to selection bias, potentially affecting the representativeness of the findings. Incomplete documentation in some hospital records and the lack of long-term follow-up beyond hospital discharge further limited the assessment of delayed maternal and neonatal complications. Therefore, larger multicenter studies with extended follow-up periods are recommended to provide more comprehensive and generalizable evidence on this important issue.

CONCLUSION

The Government of Bangladesh, with support from development partners, has invested significantly in maternal health programs to achieve MDG-5. Prolonged and obstructed labour remains a common intrapartum complication contributing substantially to maternal and perinatal morbidity and mortality. To address this, the government aims to reduce the maternal mortality ratio (MMR) to 143 per 100,000 live births by 2015 and increase skilled birth attendance to 50%. The Health, Nutrition and Population Sector Program (HNPSP) has adopted a national maternal health strategy focusing on Emergency Obstetric Care (EOC), early detection of complications, appropriate referral, and improved quality of care. While policy documents and strategic frameworks are theoretically sound and promising, implementation challenges persist. Effective referral systems, access to quality care, nationwide EOC coverage, nutrition programs, and demand-side financing mechanisms like voucher schemes remain inadequately implemented. Addressing these gaps is crucial to reducing MMR and achieving MDG-5 within the remaining timeframe.

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Conflicts of Interest
There are no conflicts of interest.

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