

Early versus late presentation in labour by parturient women at a tertiary facility in North Central Nigeria: A cross-sectional study

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ABSTRACT

Background: Adequate intrapartum care is important in modulating pregnancy outcome through prevention, early recognition and appropriate treatment of intrapartum complications.

Aim: To compare labour outcome following early to that of late presentation in labour.

Methods: A cross-sectional study at a tertiary hospital in North central Nigeria. Participants were pregnant women who presented in labour categorized into early (cervical dilatation ≤ 5 cm) or late (cervical dilation 9 or 10cm) at the study site with singleton, live foetus at ≥ 28 weeks gestation. Deliveries before arrival at the delivery room were excluded from the study. Data was obtained from the hospital delivery records while data management was performed with SPSS version 21.0; p-value < 0.05 was significant.

Results: Out of the 8,645 deliveries, 5,809 (67.2%) presented early while 2,836 (32.8%) presented late in labour. Late presentation was higher among booked women (1716 vs. 1120; $p < 0.001$) as well as

prior treatment and presentation after onset of complications (1964 vs. 872; $p < 0.001$). Labour interventions including augmentation of labour (2718 vs. 316; $p < 0.001$), episiotomy (2319 vs. 949; $p < 0.001$), assisted breech delivery, ventouse, forceps and caesarean deliveries were higher for early while obstructed labour (95 vs. 238) was higher for late presentation. The perinatal mortality was 78/1,000 and 192/1,000 live birth for early and late presentations in labour.

Conclusion: Late presentation in labour is associated with higher perinatal mortality; antenatal clinic health education should emphasize early presentation in labour while admissions into health institutions should be regulated based on available manpower and facilities for patient management.

INTRODUCTION

Labour is a dynamic process; therefore, intrapartum care is designed to provide maternal and foetal monitoring leading to a safe delivery as part of the benefits of maternity services.¹ Counseling in labour, monitoring with the aid of partograph, companionship, labour analgesia and other maternal and foetal health evaluation protocols provide opportunities for prevention, early detection and

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prompt intervention when complication arises. In Nigeria, about 39% of births occur at facilities with skilled birth attendants;¹ while some of these present late in advanced labour with no time for adequate intrapartum care.² This may be associated with the high maternal mortality ratio (512/100,000) and perinatal mortality rate (49/1000) in Nigeria which are among the highest in the world.² The delay in presentation during labour is related to the three-level delay framework of delays in decision to access care, delay in arrival at health care facility and delay in administering appropriate care at the health facility. These delays have resulted in many avoidable maternal and perinatal deaths in sub-Saharan Africa including Nigeria.³ Late presentation in labour is associated with increased risk for lower genital tract laceration, postpartum haemorrhage (PPH), prolonged hospital stay and neonatal complications (perinatal asphyxia, neonatal sepsis and intensive care admission).^{4,6} However, a few other studies reported no difference in adverse perinatal^{6,7} or maternal⁷ outcome when women presented early or late in labour. Therefore, there is need to add to the available evidence on the relationship between the timing of presentation in labour and pregnancy outcome in order to improve the protocols for patient counseling and education about labour and delivery. This study was aimed at determination and comparison of labour outcome among who presented early to those who presented late at the delivery room during labour.

METHODS

The study was conducted at University of Ilorin Teaching Hospital (UIITH), a referral tertiary facility in North Central Nigeria. It was a cross-sectional study. The study participants were women who presented and delivered at the delivery room of the study site over a ten year period from 2008 to 2017; these were categorized into those who presented early (cervical dilatation \leq 5cm) or late (cervical dilatation of 9 or 10cm) during labour. The inclusion criteria included singleton live foetus after fetal viability (28 weeks), delivery at the study site and

availability of the labour and delivery data. Women with pre-viable pregnancies ($<$ 28 weeks gestation), multiple pregnancies, intrauterine foetal death and birth before arrival at the hospital were excluded from the study.

The study was a total population study and all deliveries during the study period which satisfied the inclusion criteria were included in the study. Data was gathered retrospectively from the delivery room registry using data collection sheets designed for the study. These included maternal age, parity, booking status and level of formal education; onset of labour, intrapartum interventions and neonatal outcomes. Data analysis was performed using Statistical Packaging for Social Sciences (SPSS) Software version 21.0 (SPSS Inc. Chicago, Illinois, USA). The results were presented in frequency tables; categorical variables were compared using Pearson's chi-square test with calculation of odds ratio at 95% confidence interval while *p value* $<$ 0.05 was considered significant. Institutional ethical approval was obtained from the Ethical Review Committee of the tertiary hospital before commencement of the study.

RESULTS

Among the 8,645 participants in the study, 5,809 (67.2%) presented early while 2,836 (32.8%) presented late in labour. Table 1 shows that significantly higher number of participants across all age groups presented early in labour; this included 48 vs. 14 for teenagers, 700 vs. 564 for age 35-39 years and 71 vs. 30 for \geq 40 years old women. Across all parity groups, significantly higher number of participants presented early in labour ($p <$ 0.001) except for those with four previous deliveries (para 4) where late presentation was higher (201 vs. 481). Early presentation in labour was significantly higher for preterm (1018 vs. 134), term (4721 vs. 2661) and post-term (70 vs. 41) pregnancies with $p <$ 0.001. Late presentation in labour was commoner among women with short inter-pregnancy interval (inter-pregnancy interval $<$ 24 months) (45 vs. 347; $p <$ 0.001).

Table 1: Biosocial characteristics of women who presented in early and advanced labour

Parameter	Early presentation (n=5809)	Late presentation (n=2836)	χ^2	Pvalue
Age (years)				
<20	48 (77.4)	14 (22.6)	214.54	<0.001
20-24	1046 (70.4)	439 (29.6)		
25-29	3052 (72.9)	1136 (27.1)		
30-34	892 (57.7)	653 (42.3)		
35-39	700 (55.4)	564 (44.6)		
≥40	71 (70.3)	30 (29.7)		
Parity				
0	2897 (72.5)	1099 (27.5)	615.921	<0.001
1	1397 (62.0)	855 (38.0)		
2	876 (81.3)	202 (18.7)		
3	345 (68.7)	157 (31.3)		
4	201 (29.5)	481 (70.5)		
≥5	93 (68.9)	42 (31.1)		
GA (weeks)				
<37	1018 (88.4)	134 (11.6)	270.34	<0.001
37-42	4721 (64.0)	2661 (36.0)		
>42	70 (63.1)	41 (36.9)		
Education				
Primary	1005(69.6)	440 (30.4)	47.47	<0.001
Secondary	2130(62.9)	1258 (37.1)		
Tertiary	2674(70.1)	1138 (29.9)		
IPI (months)				
<24	45 (11.5)	347 (88.5)	309.300	<0.001
≥24	964 (61.1)	614 (38.9)		
Booking status				
Booked	4126 (70.6)	1716 (29.4)	96.253	<0.001
Unbooked	1683 (60.0)	1120 (40.0)		

GA: Gestational age; IPI: Inter pregnancy interval

Table 2 shows that both spontaneous (5795 vs. 2827) and induced (14 vs. 9) labour were higher among those who presented early in labour (p0.0518). Higher number of women who presented late in labour had treatment at private hospitals (713 vs.819) and traditional birth attendants (312 vs. 365) before presentation while majority of those who received prior treatment at Primary Health Care centers (1440 vs. 780) presented early in labour. In all, higher number of women who presented late in labour had prior treatment before presentation (872 vs. 1964). Intrapartum interventions including augmentation of labour (2718 vs. 316; p0.001), assisted breech (37 vs. 13), ventouse (9 vs. 2), forceps (7vs. 3) and caesarean (1325 vs. 844) deliveries as well as episiotomy (2319 vs. 949; p<0.001) were higher among women who presented

early in labour. Antepartum haemorrhage (226 vs. 445) and obstructed labour (95 vs. 238) were higher with late presentation while severe preeclampsia / eclampsia (757 vs. 376), perineal laceration (907vs. 391;p0.026) and PPH(287 vs. 44) were higher among those who presented early in labour.

Table 2: Labour and delivery outcomes following presentation in early and advanced labour

Parameter	Early presentation n=5809	Late presentation n=2836	χ^2	P-value
Onset of labour				
Spontaneous	5795 (62.7)	2827 (32.8)	0.419	0.0518
IOL	14 (60.9)	9 (39.1)		
Prior treatment				
No	3344 (79.3)	872 (20.7)	719.85	<0.001
Yes	2465 (55.7)	1964 (44.3)		
Place of treatment				
TBA	312 (46.1)	365 (53.9)	1063.0	0.001
PHC	1440 (64.9)	780 (35.1)		
Private hospital	713 (46.5)	819 (53.5)		
Augmentation of labour				
Yes	2718 (89.6)	316 (10.4)	1063.0	0.001
No	3091 (55.1)	2520 (44.9)		
Mode of delivery				
SVD	4431 (69.2)	1974 (30.8)	50.30	<0.001
Assisted breech	37 (74.0)	13 (26.0)		
Ventouse	9 (81.8)	2 (18.2)	33.804	0.001
Forceps	7 (70.0)	3 (30.0)		
CS	1325 (61.1)	844 (38.9)		
Episiotomy				
Yes	2319 (71.0)	949 (29.0)	33.804	0.001
No	3490 (64.9)	1887 (35.1)		
Maternal complications				
None	4444 (71.9)	1733 (28.1)	688.20	<0.001
PE	757 (66.8)	376 (33.2)		
APH	226 (33.7)	445 (66.3)		
Obstructed labour	95 (28.5)	238 (71.5)		
PPH	287 (86.7)	44 (13.3)		
Maternal complications				
None	4444	1733	221.41	<0.001
Yes	1365	1103		
Perineal laceration				
Yes	907 (69.9)	391 (30.1)	4.983	0.026
No	4902 (66.7)	2445 (33.3)		

IOL: Induction of labour
 PE: Severe Pre-eclampsia/ eclampsia
 PHC: Primary health care center
 PPH: Postpartum hemorrhage.
 SVD: spontaneous vaginal delivery
 TBA: traditional birth attendants
 APH: Antepartum hemorrhage
 CS: Caesarean section

Table 3 shows that birth weights<2500g (440 vs. 355), 2500-4000g (5322 vs. 2469) and >4000g (47 vs. 12) were higher among women who presented early in labour. All categorizations of first (p0.005) and fifth (p<0.001) minute APGAR scores were higher among women who presented in early labour. However, perinatal mortality (453 vs. 546,

p0.001) was higher for late presentation; the perinatal mortality rates were 78 per 1000 for early and 192.5 per 1000 live birth for late presentations in labour.

Table 3: Comparison of neonatal outcome following early or late presentation in labour

Parameter	Early presentation n= 5809	Late presentation n= 2836	χ^2	Pvalue
Birth weight (g)				
<2500	440 (55.3)	355 (44.7)	59.19	<0.001
2500-4000	5322 (68.3)	2469 (31.7)		
>4000	47 (79.7)	12 (20.3)		
APGAR score (1')				
<4	1163 (66.9)	576 (33.1)	10.41	0.005
4-6	1132 (70.6)	472 (29.4)		
≥7	3514 (66.3)	1788 (33.7)		
APGAR score (5')				
<4	521 (52.3)	475 (47.7)	240.64	<0.001
4-6	563 (89.4)	67 (10.6)		
≥7	4725 (67.3)	2294 (32.7)		
NICU Admission				
Yes	883 (68.6)	404 (31.4)	1.372	0.241
No	4926 (66.9)	2432 (33.1)		
Neonatal status				
Alive and well	5193 (70.1)	2217 (29.9)	195.997	<0.001
Alive and sick	163 (69.1)	73 (30.9)	0.386	0.534
Perinatal death	453 (45.2)	546 (54.8)	246.185	<0.001

NICU: Neonatal intensive care unit

DISCUSSION

In this study, about one-third (32.8%) of the participants presented late in labour and many of these had short inter-pregnancy interval. Majority of women who presented late were booked and had received treatment at other facilities prior to presentation. Women who received prior care at private health facilities and TBAs presented late in labour while majority of those cared for at PHC presented early in labour. Medical interventions such as induction and augmentation of labour, assisted breech, instrumental vaginal and caesarean deliveries as well as episiotomy were higher among women who presented early. While severe preeclampsia/ eclampsia was commoner among women who presented early obstructed labour was commoner among those who presented late; however, perineal lacerations and PPH were commoner with early presentation. Although neonatal intensive care admission was higher with early presentation, perinatal mortality rates were higher with late presentation in labour.

Labour represents the beginning of the process which culminated in the delivery of the newborn marking the end of pregnancy. The outcome of labour is dependent on the quality of intrapartum care administered; thus, timely presentation at the health facility affords the opportunity to access optimal intrapartum care.⁷ Previous studies on the effect of late presentation in labour on pregnancy outcome has been diverse in methodology ranging from evaluation of women who delivered vaginally immediately after arrival in the labour ward⁷ to those who presented in second stage or delivered in vehicles before arrival at the facility.⁴ Therefore, comparison of study reports has been challenging due to the diverse methodology; however, the bottom line for all the studies remain the hindrance to adequate intrapartum care due to the very short duration between presentation and delivery.

Similar to the report of this study, late arrival in labour is a common phenomenon in low-income countries^{7,8} with a prevalence of 25.3% reported in Jos, Nigeria.⁸ Late presentation in labour has been associated with high parity, low educational status and poor utilization of antenatal facility although this were not reported in this study.^{7,8} Also, other studies have reported that booking status has not been an effective panacea for late presentation in labour similar to this study. In two previous reports, the proportion of booked women who presented late in labour were 86.4%⁴ and 78%⁷ respectively. This raises a concern about the need to review the content and quality of health education, health promotion activities, birth preparedness and complication readiness among antenatal attendees to prevent late presentation in labour.⁹ Although not assessed in this study, reasons advocated for late presentation from previous studies include the fear of financial implication or intervention, transportation challenges, absence of the husband at home when labour started, failure to recognize labour, precipitate labour and a planned home delivery by the pregnant women.^{7,8}

This study showed that 69.3% of women who presented late in labour had prior treatment before arrival at the study site. Over the last two decades, emphasis has been on facility delivery to ensure access to skilled care and timely referral for additional care when the need arises.³This becomes imperative as pregnant women access care at various levels of healthcare facilities with gradation in the level of care which allows patient transfer to secondary and tertiary centers for specialist care. Referral is the process of a coordinated movement of a health care seeker to reach a higher-level of care within a small window of time. The goal of timely referral is to minimize or prevent delays and ensure pre-and intra-hospital care before and during the transfer to the referral facility.¹⁰In a report from Bangladesh in which the researchers provided transportation facility for patients requiring additional care; the authors reported that patients/patient relatives took more than four hours to agree to the referral in 46% of cases while 76% referrals were intrapartum.¹¹ This suggests that although transportation challenges promotes late presentation in labour, delay in obtaining the approval and support from the patients or their care givers to allow the transfer is a major contributor to late presentation. Another study from India revealed that conditions associated with intrapartum referrals were often known before onset of labour and delivery; thus, such patients should not have been admitted for care at such facilities in the first instance.¹²In a study on emergency obstetric admissions, the authors reported that the average duration of stay at the referring hospital before referral was 22.25 hours.¹³The higher report of severe preeclampsia/ eclampsia among women who presented in labour in this study may be due to the fear of the convulsions while the higher APH and obstructed labour suggests worsening clinical conditions after initial admissions resulting in late referrals. The pattern of the cases who presented late during labour in this study is similar to another report in which severe preeclampsia/ eclampsia, obstructed labour and APH were the leading causes

of emergency obstetric referrals to a tertiary center.¹³Another study noted that most intrapartum referral occurs after the onset of complications thereby predisposing to additional time loss during transfer while there is usually no provision for intra-transfer care leading to poor treatment outcome.¹⁴ This underscores the need to develop and enforce a protocol which stipulates the guideline on cases that should be managed at each level of healthcare facility based on available facilities at such centers.

The aim of modern maternity service is to optimize the well-being of the mother, foetus and newborn;⁸this is achieved through intrapartum care with the need for interventions when necessary. Interventions in labour can be lifesaving when properly implemented although an injudicious use portends danger to maternal, foetal and neonatal health. When indicated, interventions can stop the progression of a pathological process thereby breaking the cascade of possible additional morbidities or mortality. While labour and delivery remain major determinants of pregnancy outcome, previously identified complications may worsen while new complications may develop intrapartum. This underscores the role of intrapartum care at ensuring a positive childbirth experience by preventing complications, as well as early identification and prompt interventions aimed at ensuring that women and their babies do not only survive but that they thrive and reach their full potential afterwards.¹ The higher occurrence of medical interventions such as induction and augmentation of labour, episiotomy, assisted breech, ventouse, forceps and caesarean deliveries among women who presented early relative to those who presented late in labour reported in this study is similar to previous reports. In a report, episiotomy and caesarean deliveries were higher for early presentation⁸while episiotomy was higher for early presentation in another study⁷both from Nigeria. Also, another report suggested that there appears to be a relationship between episiotomy risk and the time spent in the labour ward before delivery.⁷ A possible explanation for the lower

intervention among women who presented late in labour is that the lack of intrapartum monitoring may have led to missed indications for which the interventions would have been appropriate. This may lead to increased perinatal mortality following late presentation as reported in this study.

The burden of still birth and perinatal mortality is disproportionately higher in low-income compared to high-income countries; thus, ensuring appropriate care during labour and delivery especially in low-income countries should be prioritized.¹ From this study, early presentation was associated with higher occurrence of low birth weight and neonatal intensive care admission while late presentation recorded higher perinatal mortality. In a similar study, both moderate and severe birth asphyxia and neonatal intensive care were higher in early presentation in labour with no neonatal death in the study.⁶ The difference in perinatal mortality between these two studies may be due to the small sample of the study (450 participants) compared to this study with recruited 8645 participants. In another report, both first and fifth minute APGAR scores were lower, while birth asphyxia, neonatal intensive care admission and perinatal mortality were higher with late presentation⁹ which is similar to this study. Another study noted poor maternal and neonatal outcomes following late presentations of women referred as emergency obstetric cases to a referral centre.¹³ Therefore, while reports vary with individual studies, perinatal mortality stands out as a factor associated with late presentation in labour across a number of the studies.

The study concludes that late presentation in labour remains high although many of the affected women were booked for antenatal care. Many late presentations followed previous admission and care at other facilities which were not equipped to handle obstetric emergencies and should not have admitted the women in the first instance. Although late presentation is associated with lower rates of obstetric interventions, it led to significant perinatal mortality which may be attributed to inadequate

intrapartum care. We recommend the formulation and enforcement of admission guidelines for the various levels of health institutions based on available manpower and facilities at each center. In addition, antenatal health education should further re-emphasize early presentation in labour, birth preparedness and complication readiness among the parturient women.

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