

Labour outcome in patients admitted in the second stage of labour at Jos University Teaching Hospital, Jos, Nigeria

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ABSTRACT

Context: Unsupervised or poorly monitored labour is associated with increased maternal and neonatal complications. Late presentation in labour is common place in this part of the world.

Objective: To determine the reasons for coming in second stage of labour and compare the labour outcome with those admitted in the first stage of labour.

Materials and Methods: This was a case control study conducted at the Jos University Teaching Hospital between September and November 2012.

Results: Of the 617 total deliveries, 156 (25.3%) were admitted in second stage of labour. Majority of women (38.57%), (10.00%), (8.57%) stated transportation difficulties, fast progress of labour and husband not around respectively as the reason for coming in second stage of labour. Maternal complications like lower genital laceration (25.7% vs 8.6%), postpartum haemorrhage (7.1% vs 2.1%), and ruptured uterus (2.1%) were more common amongst the cases than the control. The total mean blood loss was similar in both groups. Complications of sickle cell crises, eclampsia, and anaemia including chorioamnionitis were found only among the cases. There were more spontaneous vagina deliveries amongst the cases while caesarean section and use of episiotomy were more amongst the control ($P < 0.01$). Instrumental delivery was similar in the two groups. Perinatal complications like fresh stillbirths (5.0%), early neonatal deaths (2.10%), birth asphyxia (5.4% vs 3.6%) and the need for admissions in special care baby unit (3.4% vs 0.7%) were more amongst the cases than the control.

Conclusions: This study identified transportation problems, fast progress of labour, absence of husband at home when labour starts as major reasons for presenting in second stage of labour. Presenting in second stage of labour was associated with worse labour outcome.

Key words: Maternal complications; perinatal complications; presentation in second stage of labour; reasons.

Introduction

The aim of maternal care is to ensure the delivery of a healthy baby to a healthy mother. Intrapartum care is integral to the attainment of this goal, and this has been significantly enhanced by the use of electronic devices in the developed countries and some centres in developing countries with such

facilities. Intermittent auscultation with Pinard's stethoscope or sonicaid in combination with the use of the partograph has also produced satisfactory results in many developing countries.^[1]

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The approach to problems occurring during labour and delivery has substantially changed in the last decade.^[2] The most significant of these changes has been the acknowledgement that vaginal delivery is not the fundamental goal of good obstetric care but good maternal and foetal outcome. In addition, maternal and foetal monitoring would lead to early detection of conditions that militate against normal vaginal delivery, and thereby offer early and useful interventions.^[2] Unmonitored labour and admission in the second stage of labour are generally considered to be associated with increased maternal and neonatal complications.^[3]

Normal labour though a continuous process has been divided into three stages for purposes of study.^[4,5] The first stage of labour is the interval between the onset of labour to full cervical os dilation, the second stage of labour is the interval between full cervical os dilation to delivery of the neonate and the third stage of labour is the period between the delivery of the neonate and the delivery of the placenta.^[5-9]

Any of the stages of labour could become abnormal. These abnormalities have been mechanically simplified into three categories; abnormalities of the power (uterine contractions and maternal expulsive efforts); abnormalities involving the passenger (foetus) and abnormalities of the passage (the pelvis). These may exist singly or in combination.^[9-11]

It is important that a woman should avail herself of the opportunity of receiving good intrapartum care for all the three stages of labour. A woman presenting in second stage of labour does not gain maximally from intrapartum care, having received no expert monitoring during the first stage of labour. It has been observed that antenatal care has led to a remarkable reduction in maternal and perinatal complications, however, these benefits may not be maximal if the women do not receive good intra partum care.^[12]

There has been no similar evaluation of this group of patients in this centre, yet every day we are faced with the challenges of rendering emergency services to patients presenting in the second stage of labour who give us little time to prepare for a delivery tray or even setting an intravenous line for the proper management of the third stage of labour. This study is, therefore, designed to determine the reasons and consequences of patients arriving in the second stage of labour to the hospital labour ward.

Patients and Methods

Study area

The study was conducted in the maternity unit of the department of Obstetrics and Gynaecology, Jos University

Teaching Hospital (JUTH) Jos, Plateau State of Nigeria. Jos is the capital city of the Plateau State which is situated in the north-central zone of the country. The obstetric unit of JUTH conducts more than 3000 deliveries annually.

Study design

This was a case-controlled study that was carried out from 1st September to 30th November 2012.

Study population

The study population comprised consenting women who presented in the first and second stages of labour at the labour ward of Jos University Teaching Hospital within the study period.

Inclusion criteria

The patients/cases were all consenting women presenting in second stage of labour with singleton term pregnancies with cephalic foetal presentation that delivered in the hospital from 1st September to 30th November 2012. The controls were women with similar conditions who presented in first stage of labour within the same study period.

Exclusion criteria

Patients excluded were those who had induction of labour, elective caesarean section, delivered before arrival, delivered macerated babies, had breech delivery, were preterm and those who had multiple (twin) deliveries. Those who were referred from other hospitals or clinics who must have benefited from first stage of labour monitoring were also excluded.

Sample size determination

The minimum sample size for the study was calculated using the formula:^[13]

$$N = z^2p(1 - p)/d^2$$

Where:

n = Minimum sample size for statistically significant study

z = Standard normal deviation at 95% confidence level = 1.96

p = The best estimate of the percentage of the target population expressed as a fraction of 100. In this case, 20% was used based on a previous study.^[3] Therefore, $P = 0.2$.

d = Degree of accuracy desired, i.e., 0.05

$$n = (1.96)^2 0.2 \times 0.8/(0.05)^2 \\ = 246$$

The minimum sample size of 246 was increased to 280.

Data collection

All the patients/cases were interviewed after delivery to determine the reasons for coming in the second stage of

labour, and the clinical condition of the mother and the foetus were assessed using a pre-structured study questionnaire. The controls were prospectively selected as the next consecutive parturient in first stage of labour with similar characteristics, as in the inclusion criteria described above.

The neonatologists were involved in the screening and resuscitation of the neonates, and those found to be compromised were admitted into the Special Care Baby Units (SCBU) for further care.

Determination of labour outcome

Cervical, vagina and perineal trauma and other maternal complications were determined by physical examination of the mother. Postpartum haemorrhage was diagnosed in women with vaginal delivery with blood loss of equal to or greater than 500 ml or caesarean section with blood loss of equal to or greater than 1000 ml. Uterine rupture was diagnosed on laparotomy. Foetal distress was diagnosed if the 1 minute Apgar score was equal to or less than 6, irrespective of the 5 minute Apgar score (which is dependent on effective resuscitation). Fresh still birth (FSB) was diagnosed if the neonate had no signs of life but was not macerated, and an early neonatal death (ENND) was diagnosed if the neonate died within the first week of life. Neonatal admission into SCBU was also considered a poor labour outcome.

Data analysis

The data was analysed using the Statistical Package for the Social Sciences version 17.0.1 (Inc. Chicago, USA) statistical software package. The student *t*-test and Chi-square test were used to test for the significance of association where appropriate. A *P* value of less than 0.05 was considered significant.

Ethical consideration

Approval for the study was obtained from the Management of JUTH based on recommendation of the Health Research Ethical Committee of the institution. Informed consent was obtained from the patients before enrolment into the study.

Results

Sociodemographic characteristics

There were 140 cases and 140 controls. Table 1 shows the sociodemographic and booking characteristics of the cases and controls. The two groups were similar in age, religion, ethnic grouping, educational status and booking status. Though the booking status of both groups was similar, there was slightly more unbooked cases among the subjects (1.4%) than the control (0.7%). The two groups were also similar among the main religious groups, i.e. Christianity and Islam.

The statistically significant differences between the two groups were in the parity and the gestational age at booking. There was higher parity in the cases, and they came for the booking visit at a later gestational age than the control.

Reasons for presenting in the second stage of labour

The most common reason for coming in the second stage of labour was due to transportation difficulties [Table 2]; 54 subjects (38.57%). Fourteen subjects (10.00%) said labour was too fast and 12 subjects (8.57%) came in the second stage because their husbands were not around when labour started. Eleven subjects (7.86%) felt they could deliver at home and 10 (7.14%) were afraid of operative delivery. Nine subjects (6.43%) lacked money for hospital delivery, another 9 (6.43%) said they did not want to waste time in the hospital

Table 1: Sociodemographic characteristics

Parameter	First stage N=140 (%)	Second stage N=140 (%)	P
Age (years) (Mean±SD)	28.65±4.82	29.80±5.15	0.055
Parity (mean±SD)	2.30±1.54	2.71±1.53	0.027*
Para 1	50 (35.7)	31 (22.1)	P=0.043*
Para 2-4	79 (56.4)	95 (67.9)	df=2
Para ≥5	11 (7.9)	14 (10.0)	χ ² =6.288
Educational status			
None	0 (0.0)	5 (3.6)	P=0.164
Primary	9 (6.4)	9 (6.4)	df=3
Secondary	54 (38.6)	51 (36.4)	χ ² =5.112
Tertiary	77 (55.0)	75 (53.6)	
Religion			P=0.588
Christianity	124 (88.6)	121 (86.4)	df=1
Islam	16 (11.4)	19 (13.6)	χ ² =0.294
Booking status			P=0.562
Booked	139 (99.3)	138 (98.6)	df=1
Unbooked	1 (0.7)	2 (1.4)	χ ² =0.337
Gestational age at booking Mean (weeks) ±SD	16.18±5.24	20.83±6.40	P=0.000*

**P* values that show statistically significant differences

Table 2: Reasons for presenting in the second stage

Reasons	Number (%)
Transportation problems	54 (38.57)
Labour progress too fast	14 (10.00)
Husband not around	12 (8.57)
Can deliver at home	11 (7.86)
Don't like operative delivery	10 (7.14)
Lack of money for hospital delivery	9 (6.43)
Want to come late	9 (6.43)
Don't know was in labour	6 (4.29)
Delay in the hospital	4 (2.86)
Influence from relatives	4 (2.86)
Don't want hospital delivery	3 (2.14)
No reason	3 (2.14)
Don't like staff attitude	1 (0.71)

before delivery and 6 subjects (4.29%) did not recognize the early symptoms of labour. Four women (2.86%) were due to delays within the hospital and another 4 (2.86%) were due to influence from relatives. Three subjects (2.14%) did not want hospital delivery initially and another 3 (2.14%) had no reason at all for coming in second stage of labour. One patient (0.71%) came in the second stage of labour because of the attitude of staff.

Mode of delivery

There were more spontaneous vagina deliveries among the subjects (81.4% vs 65.0%) whereas there was more use of episiotomy among the control (22.9% vs 15.7%) [Table 3]; however, these differences were not statistically significant. However, the rate of caesarean section was significantly higher amongst the control ($P < 0.01$). Instrumental delivery was similar among the two groups.

Maternal morbidity

Vaginal/perineal laceration was 25.7% among the subjects as compared to 8.6% among the controls ($P < 0.01$) [Table 4]. Uterine atony was similar between the two groups each 2.8%. Postpartum haemorrhage was found more among the subjects (7.1%) as compared to the controls (2.1%), however, this was not statistically significant. Uterine rupture was found only among the subjects (2.1%).

The total mean blood loss was similar for the subjects (220.71 ± 195.64 ml) and the controls (217.86 ± 131 ml). For caesarean section, the mean blood loss was more among the controls (468.75 ± 178.77 ml) compared to the subjects (383.33 ± 189.30); for spontaneous vaginal delivery, there was more mean blood loss among the subjects (217.98 ± 208.46 ml) as compared to the controls (171.98 ± 61.11 ml) with a P value of less than 0.05.

Medical complications of sickle cell crises, eclampsia, and anaemia including chorioamnionitis were found only among the subjects and none among the controls. The only medical condition that was admitted among the control was diabetes mellitus and was managed without complications. One hundred and twenty-two (87.1%) of the controls and 90 (64.3%) of the subjects did not have any complication/morbidity ($P < 0.05$).

Foetal outcome

Cases of asphyxia were 8 (5.7%) among the subjects as compared to 5 (3.6%) in the controls [Table 5], however, this was not statistically significant. The mean 1 minute Apgar score of the controls (7.83 ± 0.87) was better as compared to 7.32 ± 2.17 of the subjects and the 5 minute Apgar score of the controls was also better (9.03 ± 0.56) as compared

Table 3: Mode of delivery

Parameter	First stage N=140(%)	Second stage N=140(%)	P
Spontaneous vaginal delivery	91 (65.0)	114 (81.4)	0.108
Spontaneous vaginal delivery/Episiotomy	32 (22.9)	22 (15.7)	0.174
Caesarean section	16 (11.4)	3 (2.1)	0.000*
Instrumental delivery	1 (0.7)	1 (0.7)	1.000

*P value that show statistically significant differences

Table 4: Maternal morbidity

Parameter	First stage N=140 (%)	Second stage N=140 (%)	P
Blood loss Mean (ml) \pm SD	217.86 \pm 131.96	220.71 \pm 195.64	0.886
Blood loss due to Caesarean section (mean \pm SD)	468.75 \pm 178.77	383.33 \pm 189.30	0.461
Blood loss due to Vaginal delivery (mean \pm SD)	171.98 \pm 61.11	217.98 \pm 20.85	0.043*
No complication	122 (87.1)	90 (64.3)	0.028*
Vaginal/perineal laceration	12 (8.6)	36 (25.7)	0.000*
PPH	3 (2.1)	10 (7.1)	0.052
Uterine atony	4 (2.8)	4 (2.8)	1.000
Uterine rupture	0 (0.0)	3 (2.1)	-
Eclampsia	0 (0.0)	3 (2.1)	-
Anaemia	0 (0.0)	2 (1.4)	-
Sickle cell crises	0 (0.0)	1 (0.7)	-
Diabetic in pregnancy	1 (0.7)	0 (0.0)	-
Chorioamnionitis	0 (0.0)	1 (0.7)	-

*P values that show statistically significant differences

Table 5: Foetal outcome

Parameter	First stage N=140(%)	Second stage N=140(%)	P
1 minute APGAR score (mean \pm SD)	7.83 \pm 0.87	7.32 \pm 2.17	0.011*
5 minute APGAR score (mean \pm SD)	9.03 \pm 0.56	8.44 \pm 2.24	0.003*
Normal foetal outcome	133 (95.0)	123 (87.9)	0.532
Asphyxia	5 (3.6)	8 (5.7)	0.405
Fresh still birth	0 (0.0)	7 (5.0)	-
Admitted in SCBU	1 (0.7)	5 (3.6)	0.102
Early neonatal death	0 (0.0)	3 (2.1)	-
Neonatal jaundice	0 (0.0)	1 (0.7)	-
Asphyxia	0 (0.0)	2 (1.4)	-
Meconium aspiration	1 (0.7)	1 (0.7)	1.000
Respiratory distress syndrome	0 (0.0)	0 (0.0)	-

*P values that show statistically significant differences

to 8.44 ± 2.24 of the subjects. Both differences in the Apgar scores were statistically significant ($P < 0.05$). There were similar cases of meconium aspiration among the two groups. There were more cases of special care baby unit admissions among the subjects (3.6%) than the controls (0.7%), although this was not statistically significant. Cases of FSB (5.0%) and END (2.1%) were found only among the subjects. The causes of END were severe asphyxia and overwhelming sepsis/jaundice. One hundred and twenty-three (87.9%) babies from the subjects and 133 (95.0%) babies from the control had no morbidity or complications.

Discussion

Arrival in the second stage of labour is a common phenomenon in developing countries. During the period of study, there were a total of 617 women who delivered in JUTH, of whom, 156 arrived in the second stage into the labour ward giving an incidence of 25.3%. This is much higher than the 7.9% reported from Benin, Nigeria,^[1] 10.7% reported from Ghana,^[14] and even the 20% reported from Ethiopia.^[3] This may be due to the fact that the hospital had moved to its permanent site, which is located at the outskirts of the town and access became difficult, especially in the night for those who did not have their means of transportation, considering that more than 38% of women presenting in the second stage of labour complained of transportation constraints. The two groups were similar in age, ethnic and religious groupings; however, the study group had a higher mean parity. Similar findings were reported by Aziken *et al.*^[1] and Porter *et al.*^[15] There was significantly higher number of multiparous and grandmultiparous women among the study group. This is a reflection of the general attitude of multiparous patients who believe that they are experienced and can take their time before presenting to the hospital when in labour. One interesting finding was the fact that there was no difference in educational status between the subjects and controls. One would have expected that those who presented in the second stage of labour would be uneducated and uninformed, but this was not the case in this study. This finding is also at variance with previous studies,^[1,15] where low educational status was a prognosticating factor for coming in the second stage of labour. The booking status of the patients does not seem to influence the stage of presentation. Almost all patients were booked, and even among the unbooked patients, the difference between the two groups was not statistically significant. The only statistically significant difference between the two groups at booking was the time of booking (first visit). The controls usually booked earlier (gestational age of 16 weeks) than the subjects (gestational age of 21 weeks) (*P* value of less than 0.01). The time at first visit (booking) may, therefore, prognosticate arrival in second stage of labour.

This study agrees with others that identified difficulties with transportation as the main reason for arrival in the second or late stage of labour.^[1,14,16,17] This study also showed that influence from relatives and absence of the husband at home at the start of labour were other common reasons. This calls for the involvement of the whole family in the management of the pregnant woman. The husband and other important family members need to be educated on the importance of and making necessary provisions for hospital delivery where monitoring of both the mother and foetus is done.

Other reasons for coming in the second stage included rapid progress of labour, the belief of the woman that she can deliver at home without complications and preferring home delivery initially, failure to recognise early signs of labour or just wanting to come late in labour so that she will not waste time in labour. In addition, not wanting hospital delivery, fear of intervention and cost were other reasons for coming for admission in second stage of labour. The solution to these perceived problems can be summed up as education and the economic enhancement of the girl child and women generally. It is, however, worth noting that a high number (98.6%) of those that came in the second stage were booked, one wonders whether the antenatal health talks delivered to them had any impact. Emphasis on the content and benefits of intrapartum care during antenatal health education is therefore desirable. One other important reason for late arrival in labour was staff attitude (0.7%), and because 2.1% women could not give any reasons why they came in the second stage and another 2.1% just did not want hospital delivery for no other reasons, one may be tempted to say that all these were because of poor attitude of staff towards women in labour. It is true that some members of staff may lack interpersonal relations and hence hospital staff too may need to be educated to improve on this.

Episiotomy was found to be higher among the controls than the subjects, though this was not statistically significant. Further, the risk of having a caesarean section was higher in the control group. Thus, there appears to be a direct relationship between the frequency of caesarean section and episiotomy and time spent in the labour ward. This seems to confirm the fears of some women who decided to come in the second stage. The fact, however, is that the main aim of modern obstetrics is to optimize the well-being of the mother and baby, and hence the fear of intervention should not be the overriding concern over what needs to be done. Probably many of the vaginal/perineal lacerations observed among the subjects in this study would have been prevented by episiotomy.

With respect to maternal complications, this study showed that arrival in the second stage is a risk factor for vaginal/perineal lacerations and to a lesser extent postpartum haemorrhage. Approximately 2% (2.1%) and 0.7% of subjects had uterine rupture and chorioamnionitis, respectively, and none among the control. This was at variance with previous studies,^[1,14,18] where postpartum haemorrhage was the only significant complication. However, the findings in this study agree with other studies on prolonged second stage.^[19,20] Thus, it appears that many of the subjects must have had prolonged second stage before presentation.

The study shows that some women who came in the second stage of labour had complications of medical conditions most probably because these medical conditions were not monitored. These included eclampsia (2.1%), severe anaemia (1.4%), and sickle cell crises (0.7%), which were not found in the controls (who were monitored). It is noteworthy to say that severe foetal complications were found among patients with these medical complications. It is also important to say that, with modern management protocols, these medical complications and their severity can be prevented. For example, magnesium sulphate can prevent eclampsia, analgesia, adequate hydration, intranasal oxygen and good monitoring can prevent severe sickle cell crises and timely transfusion can prevent complications of severe anaemia. Therefore, it becomes important to consider these medical complications when counselling women against coming for admission late in labour.

The perinatal outcome was worse among the subjects than the control. First minute Apgar score was worse among the subjects. Fifth minute Apgar score was also worse among the subjects (though this is also dependent on good resuscitation), however, because this was always done by the neonatologists, it may be a reflection of the events of labour. There were also more cases of perinatal deaths and the need for Special Care Baby Unit admissions among the subjects than the control. This result is in contrast with previous studies by Aziken *et al.* in Benin, Nigeria and Nkyekyer in Accra, Ghana,^[1,14] but agrees with others done on prolonged second stage of labour.^[16,20] The findings in this study, therefore, suggest that many of these women must have been in the second stage of labour for some time before presenting to the labour ward.

Conclusion

In conclusion, this study has identified high parity, late booking (first visit), transportation problems, fast progress of labour, absence of husband at home when labour starts, belief that the woman can deliver at home and fear of operative delivery as the main causes of coming in second stage of labour. Further, admission in second stage was found to be a risk factor for poor maternal and perinatal outcome. On the other hand, admission in the first stage of labour increased the risk of episiotomy and caesarean section.

Limitations of the study

- It was difficult getting the reason for presenting in the second stage of labour in some patients, especially if their reason was attitude of staff of the hospital
- It was difficult to identify the time spent in the second stage of labour for the subjects and the effect this may have on labour outcome.

Benefits of the study

- Patients will be counselled on the dangers of presenting in the second stage of labour (where they will not benefit from the first stage of labour monitoring)
- The study has provided evidence-based information to enhance antenatal counselling directed at those who would want to come for admission late in labour
- There is enhanced value of birth preparedness and complication readiness from findings from the study.

Recommendations

- Birth preparedness should be enhanced in our antenatal health talks to reduce the issue of transportation difficulties
- The husband and the whole family should be involved and educated on the advantages of early arrival and delivery in the hospital
- The women themselves especially those of higher parity should be advised against their perceived confidence to present themselves late in labour or delivery at home
- Government should make delivery in the hospital free to encourage the poor ones who are afraid of hospital expenses
- Staff should be educated on the importance of professional conduct and understanding when relating with pregnant women especially those in labour.

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Conflicts of interest

There are no conflicts of interest.

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