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Maternal and Neonatal Morbidity due to Prolonged Second Stage of Labour

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Abstract

Background: *A prolonged second stage is generally responsible for maternal and neonatal morbidities like postpartum hemorrhage, third or fourth degree perineal tears, operative modes of deliveries, increased risk of Apgar score less than 7, meconium passage and neonatal intensive care unit(NICU) admission.*

Methodology: *This is a prospective, observational study conducted at the Department of Obstetrics and Gynaecology at Gajra raja Medical College, Gwalior Madhya Pradesh, from January 2017 to June 2017 done on 500 cases. Study included uncomplicated primipara and multipara, single viable pregnancy, fetus in vertex position and gestational age > 37 weeks.*

Results: *Out of the total 500 patients, 286 were nulliarpous and 214 were multiparous. 15.7% of nulliparous patients had prolonged labour. 72 belongs to > 35 years age group, 33 of them had prolonged second stage of labour. Out of the total 70 patients with prolonged second stage of labour 55.8% underwent the vaginal delivery and 44.2% underwent caesarean section. Of the total 500 patients, 33 had perineal trauma of which 24 had prolonged second stage of labour. 39 had PPH of which 26 had prolonged second stage, 74 babies had low apgar score of which 46 had prolonged second stage. 86 were admitted in NICU for > 48 hrs of which 51 were born to mother with prolonged second stage of labour.*

Conclusion: *The maternal and perinatal morbidities increase with prolonged duration of the second stage of labour. Hence second stage of labour should be monitored with vigilance.*

Introduction

Prolonged second stage of labour is usually defined as 2–3 hours for primiparous women and 1–2 hours for parous women, with the longer interval for women with epidural analgesia during labour[1,2]. A prolonged second stage is generally responsible for maternal and neonatal morbidities like postpartum hemorrhage, third or fourth degree perineal tears, operative modes of deliveries, increased risk of Apgar score less than 7, meconium passage and neonatal intensive care unit (NICU) admission. The purpose of this study is to assess maternal and neonatal morbidities associated with a prolonged second stage of labor.

Aims and Objectives

- To assess maternal and perinatal outcomes as a function of second-stage labor duration.

Material and Methods

This is a prospective, observational study conducted at the department of Obstetrics and Gynaecology at Gajra raja Medical College, Gwalior Madhya Pradesh, from January 2017 to

June 2017. Sample size was 500. Written informed consent was taken from all the patients. The necessary permission and approval from institutional ethics committee was taken.

Study included uncomplicated primipara and multipara, single viable pregnancy, fetus in vertex position and gestational age > 37 weeks and excluded any pregnancy with medical and obstetric complications

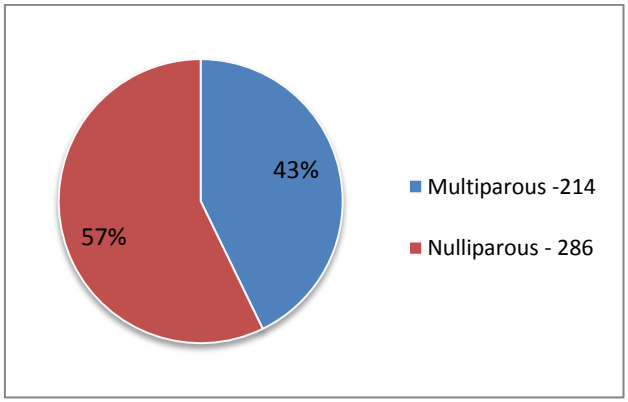
The patients who fulfilled the inclusion criteria were evaluated and enrolled in the study at the labour room and the procedure and purpose of the study was explained to them. Patient's detailed history, including age, parity, gestational age, clinical examination, including general physical examination, per abdomen examination, per speculum, per vaginal examination, and investigations, were recorded on a pre-designed proforma. The patients were carefully watched for progress of labour and were strictly monitored for FHR. Duration of second stage was calculated from the cervical examination. Continuous monitoring of FHR and contractions was done every 5 min during 2nd stage. Delivery was expedited, when FHR abnormalities were detected by the safest possible method (Instrumental Delivery or Caesarean section). Maternal and neonatal morbidity were evaluated in relation with duration of second stage of labour.

Statistical Analysis

Statistical analysis was performed using chi-square test and p- value. The probability value <0.05 was considered significant.

Results

Graph 1: Distribution of cases according to parity



Out of the total 500 patients, 286 were nulliarpous and 214 were multiparous.

Table 1: Distribution of cases as per duration of labour

Parity	Duration of labour	
	<2hrs	>2hrs
Nulliparous (268)	241 (84.3%)	45 (15.7%)
Multiparous (214)	189 (88.3%)	25 (11.7%)

15.7% of nulliparous patients had prolonged labour whereas only 11.7% of multiparous patients had prolonged labour.

Table 2: Relationship of age with duration of second stage of labour

Age	Duration of second stage	
	Normal (430)	Prolonged (70)
<35 yr	391 (90.93%)	37 (52.85%)
>35 yr	39 (9.07%)	33 (47.14%)

Out of the total 500 patients, 72 belongs to > 35 years age group, 33 of them had prolonged second stage of labour.

Table 3: Relationship between Induction and second stage of labour

Induction	Duration of second stage	
	Normal	Prolonged
Induced (290)	246 (84.83%)	44 (15.17%)
Spontaneous (210)	184 (87.62%)	26 (12.38%)

Total 70 patients had prolonged second stage of labour of which 44 were induced and 26 underwent spontaneous delivery.

Table 4: Relationship between mode of delivery and duration of second stage of labour

Mode of delivery	Duration of second stage	
	Normal (430)	Prolonged (70)
Vaginal Delivery	407 (94.7%)	39 (55.8%)
Emergency Caeserean section	23 (5.3%)	31 (44.2%)

Out of the total 70 patients with prolonged second stage of labour 55.8% underwent the vaginal

delivery and 44.2% underwent caesarean section. In contrast only 5.3% patients with normal duration of second stage underwent caesarean section.

Table 5: Relationship between Perineal trauma and duration of second stage of labour (n=500)

Perineal Trauma	Duration of second stage	
	Normal	Prolonged
Present	9 (1.8%)	24 (4.8%)
Absent	421 (84.2%)	46 (9.2%)
Total	430 (86%)	70 (14%)

χ^2=101.21, p<0.05

Of the total 500 patients, 33 had perineal trauma of which 9(1.8%) had normal second stage of labour and 24(4.8%) had prolonged second stage of labour.

Table 6 Relationship between postpartum haemorrhage and duration of second stage of labour.

Postpartum Haemorrhage	Duration of second stage	
	Normal	Prolonged
Present	13 (2.6%)	26 (5.2%)
Absent	417 (83.4%)	44 (8.8%)
Total	430 (86%)	70 14%)

χ^2=97.45, p<0.05

Of the total 500 patients, 39 had postpartum haemorrhage, 26(5.2%) of them had prolonged 2nd stage of labour and 13(2.6%) delivered within normal duration.

Table 7: Relationship between 5min APGAR score and duration of second stage of labour

5 min APGAR	Duration of second stage	
	Normal (430)	Prolonged (70)
<= 7	28 (5.6%)	46 (9.2%)
>7	402 (80.4%)	24 4.8%)

χ^2=167.33, p<0.05

Of the total 500 patients delivered, 74 babies had low apgar score, of which 46(9.2%) had prolonged second stage of labour, 28(5.6%) had normal duration of second stage of labour.

Table 8: Relationship between incidence of meconium passage and duration of second stage of labour

Meconium stained liquor	Duration of second stage	
	Normal (430)	Prolonged (70)
Present	55 (11%)	39 (7.8%)
Absent	375 (75%)	31 (6.2%)

χ^2=72.65, p<0.05

Of the total 500 patients delivered, 94 babies passed meconium, of which 39(7.8%) had prolonged second stage of labour.

Table 9: Relationship between NICU admission > 48 hours and duration of second stage of labour

NICU admission >48 hrs	Duration of second stage	
	Normal (430)	Prolonged (70)
Present	35 (7%)	51 (10.2%)
Absent	395 (79%)	19 (3.8%)

χ^2=177.04, p<0.05

Of the total 500 babies delivered, 86 were admitted in NICU for > 48 hrs, of which 51(10.2%) were born to mother with prolonged second stage of labour.

Discussion

The data, which was collected and analyzed above showed that, the increase in the duration of second stage of labor is associated with adverse maternal and neonatal outcomes. Results of our study are in accordance with that of previous studies which stated that increased maternal age is associated with prolonged labor. Incidence of prolonged labor in patients of age >35 years is 6.6% which is similar to 10.8% of Allen VM et al[3] and 8.9% of Nystedt et al,[4] 7.03% of Sangeeta Shah et al.[5] Percentage of prolonged labor in nulliparous in the present study is 15.7% and in multiparous is 11.7% (with significant p value <0.001). The present study shows that nulliparous has more incidence of prolonged labour than when compared with multiparous women, also confirmed by other studies like Sangeeta Shah et al.[5] where the prevalence of prolonged labour in nulliparous women was 17.5% and in multiparous women was 13.92%. Similar findings were

reported by Nystedt et al[4] where the prevalence of prolonged labour in nulliparous women was 35.6% and in multiparous women was 10.2%.

Induction of labor prolonged the duration of second stage, women who were spontaneously set into labor were delivered within normal duration (5.2%) than when compared to induced women (8.8%). A similar effect is found by Leeuw JW et al[6] that induction of labor is associated with increase in the duration of second stage, also induction is associated with increase in the incidence of perineal tears.

Incidence of caesarean section for prolonged second stage in the present study is 44.2%, which is similar with 35.4% of Nystedt et al,[4] 21.7% of Allen VM et al.[3] Therefore as the duration of second stage of labour increases there is decreased incidence of normal vaginal delivery, and increased incidence of instrumental delivery and emergency cesarean section.

Incidence of perineal trauma is 4.8% in the present study, which is comparable with 7.77% of Leeuw JW et al,[6] 8.7% of Rouse DJ et al[7] and hence it shows that increase in duration of second stage is associated with instrumental delivery that is responsible for perineal trauma. Leeuw JW et al[9] found in his study that there is a significant increase in the third degree perineal tears with increase in the duration of duration of second stage of labor. Stretching of the perineum for a longer period of time may lead to ischemia, which may increase the risk of rupture of the perineum.

Incidence of postpartum hemorrhage is 5.2% in the present study which is comparable with 6.5% of Balki M et al,[8] 4.9% of Rouse DJ et al[7] and 4.51% of Laughon SK et al.[9] This indicates that increase in the duration of second stage of labour is associated with increased incidence of postpartum haemorrhage that may be due to atony of uterus or cervical and vaginal laceration as due to instrumental extractions.

Incidence of 5min apgar <7 in present study is 9.2% which is similar with 8.3% of Salustiano et al[10] and 6.9% of Shamsha et al.[11]

Incidence or need for NICU admission or care for > 48 hrs in the present study is 8.2% which is similar with 7.30% of Laughon SK et al,[9] and 8.1% of Rouse DJ et al[7] this indicates that prolonged second stage labour duration is associated with increase in the incidence of intubation and increase in the need for NICU admission.

Conclusion

The maternal and perinatal morbidities increase with prolonged duration of the second stage of labour. Mode of delivery is influenced by increase in the duration of second stage of labour, the incidence of normal vaginal deliveries decrease and the need for instrumental delivery and LSCS increased with prolonged second stage of labour.

The significant maternal complications with prolonged labor include Postpartum hemorrhage and perineal trauma (3rd and 4th degree perineal tear). Neonatal complications associated with increase in the duration of second stage of labour include low Apgar i.e., 5min Apgar score <7, increased incidence of passage meconium, need for intubation in the delivery room and need for NICU admission >48 hours. Hence second stage of labour should be monitored with vigilance for better fetomaternal outcome.

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