

## Primiparity as an intrapartum obstetric risk factor

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### Abstract

**Objective:** To ascertain whether primiparity is an intrapartum obstetric risk factor for maternal and perinatal outcome.

**Methods:** The comparative case-controlled study was conducted at the Department of Obstetrics and Gynaecology of Sir Syed Hospital, a tertiary care facility in Karachi, from January 2008 to June 2009. A self-developed structured proforma was used to obtain relevant information about 400 women who were recruited part of the study: 200 primigravida and 200 multigravida. The proforma covered detailed record of labour management. Inclusion criteria was singleton pregnancy with cephalic presentation at term. Exclusion criteria was significant medical illness, recurrent miscarriages, bad obstetrical history, intrauterine death, congenital anomalies, previous uterine scar, multiple pregnancy, malpresentation, significant antepartum haemorrhage and Rhesus (Rh) incompatibility.

**Results:** Primigravidas were at significantly higher risk for prolonged first and prolonged second stage of labour, increased chances of foetal distress during labour and need for intensive monitoring as compared to the multigravidas. Primigravidas were also at significantly increased risk for operative vaginal delivery and emergency caesarean section. The chances of primary postpartum haemorrhage in primigravidas were found to be more, and perinatal morbidity was also increased in the group.

**Conclusion:** Results highlighted primiparity as a risk factor for maternal and perinatal outcome in comparison with multigravida.

**Keywords:** Uncomplicated primigravida, Intrapartum obstetric risk factor. (JPMA 62: 694; 2012)

### Introduction

Intrapartum period has higher risk of mortality for a mother and her baby. An estimated 42% of the world's 535,900 annual maternal deaths are intrapartum-related.<sup>1</sup> These deaths are closely linked to the deaths of 1.02 million babies during labour and 904,000 intrapartum-related (birth asphyxia) neonatal deaths.<sup>1</sup> In many developing countries, most women deliver at home or in clinics where even basic facilities are lacking. Even among women without pregnancy complications, women in labour and their babies can rapidly develop complications where timely access to health services may be life-saving.<sup>2</sup> Identification before labour of women at risk of dystocia and timely referral to a district hospital for delivery is one of the strategy to reduce maternal and perinatal morbidity and mortality.<sup>3</sup>

Intrapartum risk is based mainly on the past obstetric history which is lacking in all primigravidas. There are fundamental differences in what constitutes normal labour in a primigravida and that which is normal in a multigravida. Indeed the statement that

'primigravidae and multigravidae behave as different species' in labour is undoubtedly accurate.<sup>4</sup> The most distinctive feature of a first labour is its length, being much longer than any subsequent labours.

A primary obstetric care objective outlined by the Healthy People 2010 is to reduce caesarean births among healthy low-risk women giving birth for the first time.<sup>5</sup> The World Health Organisation examined national caesarean section (CS) rates and maternal and perinatal mortality rates from various countries and concluded that there is no additional health benefits associated with a CS rate above 10-15%.<sup>6</sup>

International obstetric CS practice identifies wide variations in CS rates in women with cephalic presentation and spontaneous labour at term, a low-risk cohort amenable to effective intrapartum corrective intervention.<sup>7</sup> In a Lahore-based study, dystocia was the main indication for CS, which accounts for 28.2% of deliveries.<sup>8</sup> Other studies in different tertiary care hospitals in Pakistan reported CS rate as high as 67.7% and 45.1% in the year 2007.<sup>9,10</sup> In a study conducted in Nawabshah, Sindh, the CS rate was seen to have

increased from 29.70% in 2003 to 36.98% in 2010.<sup>11</sup>

In order to curb the rising CS rate among obstetric low-risk pregnant women, careful thought should be given to the outcome of future pregnancies while making a decision to perform a primary CS.<sup>12</sup> The purpose of this study was to ascertain whether primiparity is an intrapartum obstetric risk factor for maternal and perinatal outcome.

## Patients and Methods

The prospective comparative, case-controlled study was conducted at the Department of Obstetrics and Gynaecology of Sir Syed Hospital, a tertiary care hospital in Karachi, which is affiliated with the Sir Syed College of Medical Sciences (for girls). The study lasted from January 2008 to June 2009. The sampling technique was convenient, non-probability sampling, and, as such, there was no need to calculate the sample size. The study comprised 400 women; 200 primigravidae and multigravidae each.

A self-developed structured proforma was used to obtain relevant information. The inclusion criteria involved age range to be 20-34 years, parity as primigravida in comparison with multigravida where parity ranged between 1-4. Gestational age taken was between 37-41 weeks. Women included with singleton foetus, cephalic presentation at term and spontaneous onset of labour. There had to be no maternal disease, no antenatal complications and no history of hospitalisation for more than 24 hours during pregnancy. Exclusion criteria was high-risk pregnancies like significant medical illness, recurrent miscarriages, Bad Obstetrical History (BOH), intrauterine death, congenital anomalies, previous uterine scar, multiple pregnancy, mal presentation, significant antepartum haemorrhage and Rh incompatibility.

Separate proformas were filled for primigravida and multigravida. Maternal characteristics were similar in primigravida and multigravida. The proforma included detailed record of labour management. Record of Bishop's score on admission and need for cervical ripening with prostaglandins when Bishop's score was <5. Cardiotocography during labour whether reactive or suspicious and presence of meconium stained liquor were noted down in the proforma. Total duration of labour including first, second and third stages of labour were recorded. Progress of labour was plotted on a partogram.

The proforma included mode of delivery - whether spontaneous vertex delivery, instrumental or

CS. The indications for instrumental delivery or CS were also noted. The need for episiotomy as well as perineal tears were recorded. Qualified and trained senior registrars were always involved in labour management. Proformas were only filled by senior registrars. Third-stage complications like postpartum haemorrhage and retained placenta were noted. Emergency management, including the need for blood transfusion and operative procedures, were taken note of. Detailed neonatal record included one- and five-minute Apgar score, neonatal birth weight, gender, congenital anomalies, neonatal examination, admission to neonatal intensive care unit (NICU), and the treatment received. After counting the findings in the proforma, results were interpreted and relative risks (RR) and odds ratio (OR) of each variable were calculated.

## Results

Of the 200 primigravidae, 26 (13%) had the gestational age beyond 40 weeks as compared to 10 (5%) multigravidae (RR) 2.6; OR 2.8. Bishop's score <5 was observed in 70 (35%) primigravidas as compared to 16 (8%) multigravidas (RR 4.4; OR 6.2). Prostaglandins used for cervical ripening was seen in 50 (25%) primigravidas compared to 8 (4%) multigravidas (RR 6.2; OR 8).

Non-reassuring cardiotocography (NR CTG) was seen in 30 (15%) primigravid women compared to 8 (4%) multigravid as (RR 4; OR 4.2). Meconium stained liquor was seen in 24 (12%) primigravidas compared to 12 (6%) multigravidas (RR 2; OR 2.1).

Of the primigravidas 64 (32%) had prolonged labour lasting for more than 12 hours, compared to 8 (4%) multigravidae with prolonged labour lasting for more than 8 hours (RR 8; OR 5.4). The active phase of first stage was prolonged for more than 8 hours in 53 (26.5%) primigravidae compared to 8 (4%) multigravidas with active phase lasting for more than 6 hours (RR 6.5; OR 8.4). Prolonged second stage for more than 2 hours was seen in 15 (7.5%) of primigravidas compared to 2 (1%) multigravidas with second stage lasting for more than 1 hour (RR 8; OR 8.6).

Normal vaginal deliveries were seen in 170 (85%) primigravidas compared to 198 (99%) multigravidas. Need for episiotomy was observed in 168 (84%) primigravidas compared to 22 (11%) multigravidas (RR 9). However, no perineal tears were seen in primigravidas compared to 6 (3%) cases in multigravidas. Instrumental deliveries were seen in 20

(10%) primigravidas compared to 2 (1%) multigravidas (RR 12; OR 13.5). Emergency CS was done in 30 (15%) primigravidas compared to 2 (1%) multigravidas (RR 15; OR 17.5). Indications for CS were foetal malposition in 8 (4%) primigravidas compared to 1 (0.5%) multigravidae. CS done due to non-reassuring CTG were seen in 13 (7%) primigravidas compared to 1 (0.5%) multigravida. CS done due to non-progress of labour was seen in 10 (5%) primigravidas compared to none among the multigravidas. In two primigravidas, emergency CS was performed in the second stage of labour due to deep transverse arrest while there was no such case among the multigravidas.

Primary Postpartum Haemorrhage (PPH) occurred in 12 (6%) primigravidas compared to 4 (2%) multigravidas (RR 3; OR 3.1). PPH was not associated with any maternal mortality. However, 8 (4%) primigravidas required blood transfusion compared to 2 (1%) multigravidas.

Uterine atony was the leading cause of PPH, seen in 10 (5%) primigravidas and 2 (1%) multigravidas. Cervical/vaginal tears were seen in equal frequency in both the groups. There was no case of retained placenta in primigravida, but there were 2 (1%) multigravidae for whom manual removal of placenta was conducted under general anaesthesia (Figure-3). Puerperial pyrexia for >24 hours was seen in 10 (5%) primigravidas as compared to 4 (2%) multigravidas (RR 2.5; OR 2.6).

Neonatal record showed 5-minute Apgar score <7 in 4 (2%) both for primigravidae as well as multigravidae. Admission to the NICU was observed in 10 (5%) neonates of primigravidas compared to 6 (3%) of multigravidas (RR 1.7; OR 1.7). Meconium aspiration syndrome was observed in 6 (3%) neonates of primigravidas as compared to 2 (1%) of multigravidas (RR 3; OR 3). There was one case of transient tachypnoea of newborn recorded in multigravidas although no such case was seen in primigravidas. Birth weight <2.5kg was observed in 14 (7%) neonates of primigravidas compared to 6 (3%) of multigravidas. Birth weight >3.8kg was seen in 8 (4%) neonates of primigravidae compared to 12 (6%) of multigravidae. There was no case of fresh stillbirth (FSB) or early neonatal death (NND) in either group.

## Discussion

The traditional obstetric belief that the first delivery is 'the true test of the pelvis' has guided many generations of practitioners. The impact of the first delivery on future pregnancy and delivery decisions by

both the patient and the obstetrician is unparalleled.<sup>13</sup> Recent evidence suggests that there is poor correlation between radiologic pelvimetry and the clinical outcome of labour.<sup>14</sup> Only active labour itself is the most important determinant of normal vaginal delivery. The main aim of interventions in dysfunctional labour should be to reduce the CS rate without adverse effects on either the mother or baby.<sup>4</sup>

The current study directly addressed the issue of parity while strictly defining the low-risk group. The results clearly demonstrate that primiparity is associated with intrapartum risks. Being a case-controlled study, the relative risks and odds ratio of primiparity were considered statistically significant. In this study the CS rate was 15% in primigravida, and 1% in multigravida which indicates good clinical practice, but RR: 15; and OR: 17 were statistically significant. Primiparous women had the longest and most gradual labour curve when compared with multiparous women. Primiparas may start the active phase after 5cm of cervical dilation<sup>15</sup> and there is no upper limit for the length of latent phase.<sup>2</sup> One study in a Nigerian tertiary hospital had shown primigravidae at a higher risk of dystocia compared with the multipara<sup>16</sup>

Amongst women selected for low obstetric risk, approximately 25% will develop peripartum complications necessitating transfer to an obstetrician-led service.<sup>2</sup> A study found that primiparity was less likely to deliver at home and had higher rates of ambulance transport from home to hospital than multiparas planning home-births.<sup>17</sup> Low-risk primiparous women were twice as likely (Adjusted OR 2.04; 99% CI 1.79-2.32) to have a CS and one-and-a-half times more likely (AOR 1.55; 99% CI 1.47-1.64) to have an instrumental birth following induction or augmentation during labour.<sup>18</sup> A study found high frequency of second-stage intervention in the form of instrumental vaginal delivery and CS in primigravida which could be due to lack of experience of previous labour in this group of women.<sup>19</sup> Another study found that nulliparas had higher prepartum and intrapartum CS rates and their increased prevalence inflates the overall CS rate.<sup>20</sup>

In this study the incidence of postpartum haemorrhage was 6% in primigravida and 2% in multigravida (RR 3; OR 3.1). These figures for PPH are within the expected range of 5 to 8% quoted in global literature.<sup>21</sup> In this study, PPH was not associated with any maternal mortality. A study had found Nulliparity as a risk factor for primary post partum haemorrhage.<sup>22</sup> Another study had reported a prolonged active, but not

passive, second stage of labour to be associated with the risk of severe PPH in nulliparas.<sup>23</sup>

Yet another study had reported higher risk (55%) of postpartum haemorrhage for emergency CS and lower for vaginal deliveries (27%) compared with planned CS.<sup>24</sup> Others had found maternal infection and postpartum haemorrhage as related to the duration of the second stage.<sup>25</sup>

The current study showed increased perinatal morbidity and higher need for NICU admission, especially the risk of neonatal meconium aspiration syndrome, in primiparous women as compared to multiparas. In this study there was no FSB or early neonatal death in either primigravidae or multigravidae. This was because of the rigorous exclusion of high-risk pregnancies. Other studies found that low-risk caesarean delivery at term was associated with a higher neonatal morbidity, NICU admissions and maternal pain in the puerperium.<sup>26</sup> Markers of abnormal labour significantly associated with spastic cerebral palsy (CP) in the basic analysis were total length of labour >20 hours and prolonged second stage of labour.<sup>27</sup> Primiparity was associated with a significantly increased risk of low birthweight compared with multigravida.<sup>28</sup> However, another study found that parity and foetal weight had an insignificant effect on perinatal mortality.<sup>29</sup>

Current available data from well-resourced countries suggest that morbidity and mortality for both mother and baby arising from CS are higher when compared with vaginal delivery.<sup>30</sup> Women who experience an operative vaginal delivery have a very high probability of achieving a spontaneous vaginal delivery in a subsequent pregnancy as compared to primary CS, although the obstetrician faces a challenge for arresting the second stage of labour. In order to reduce the CS rate for failure to progress, adequate uterine contractions should be achieved during active phase of labour and careful thought should be given while making a decision for primary CS.

## Conclusion

Though the sampling technique was a limitation of the study, the results underscore the fact that primigravida is a risk factor for prolonged first and second stages of labour, increased chances of foetal distress during labour and may need intensive monitoring. Delivery of a primigravida outside hospital premises should be discouraged and women should be counselled for supervised antenatal care and delivery.

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