



## Seven Years Consecutive Cesarean Section in Primigravidae: Analysis and Evaluation

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### Abstract

**Background:** *primigravidae are high-risk patients and are important regarding subsequent obstetrical performance. The world-wide incidence of Cesarean section continues to rise; nulliparity is a contributing factor for the rising as dystocia is a common reason for intervention in nulliparous parturient.*

**Objective:** *to review, assess the Cesarean section rates, analyze the types and evaluate clinical indications, perinatal outcome of Cesarean section rates performed in primigravidae.*

**Materials & Methods:** *a retrospective review of all primigravidae who underwent Cesarean section (2221) between 1st Jan. 2002 and 31st Dec. 2008; was done. The data were collected from the records of the labour room and the medical records. The most important indication was assigned to that patient.*

**Results:** *Cesarean section rate was significantly increased and along the period of study changed by 109.5%. It is increased with increasing maternal age reaching 64.4% among mothers aged 35 years or more, and emergency Cesarean section during labour were significantly less frequent (42.6%) carried out in the oldest age group. Most sections are carried out as emergencies either during labour (53 %) or before labour (18.2%). Dystocia was the main indication in 26.7% of all Caesarean sections in present study. Malpresentations; mainly breech presentations; is the second dominant indication in primiparae. Fetal distress represented 21.4% of the indicated Cesarean sections. The perinatal mortality rate was reported to be 36.5/1000 live births and preterm Caesarean deliveries represented 13.2%. While low birth weight represented 15.4% of the total live births; macrosomia accounted for 8.7% of them.*

**Conclusions:** *a dramatic increase in Caesarean sections rates among primigravidae explaining the annually increased primary Caesarean section rates. Increasing maternal age is strongly associated with increased Caesarean section rates and commonest indications were dystocia and breech presentaion.*

**Key words:** *primigravidae, advanced maternal age, Caesarean sections, dystocia and perinatal outcome.*

## Introduction

The overall Cesarean delivery rate has continuously increased in recent decades similarly in both developed and developing countries. In Nigeria; Igberase et al.<sup>[1]</sup> reported a high Caesarean section (CS) rate (34.5%); while Suzuki Sh. And Naka M.<sup>[2]</sup> reported an increased rate reaching 23.4% in Japan. Also in USA<sup>[3]</sup>, the CS rate has increased by more than 10 % (from 26% to 36.5%) in a short time. The rate of CS is influenced by many factors that contributed to the increase of CS rate, such as the physician style and training, age, parity, race, socioeconomic status, mother request, financial, medico legal considerations, and mainly the increased safety of the operation<sup>[4]</sup>. The incidence continues to rise with dystocia recognized as the major indication; Ambwani et al<sup>[5]</sup> stated that the rate of CS in primigravidae with unengaged heads at term was 34%. It was found that nulliparae had higher prepartum and intrapartum CS rates and their increased prevalence inflates the overall CS rate<sup>[6]</sup>. Furthermore; primigravida is a risk factor for prolonged first and second stages of labor, increased chances of fetal distress during labor and may need intensive monitoring<sup>[7]</sup>. Fawole et al. [8] had reported that primigravidae are at a higher risk of dystocia compared with the multipara. Also it has shown that the elderly primigravidae are at increased risk of Caesarean deliveries compared to their younger ones counterparts that resulted from various pregnancy and labor complications, including cephalopelvic disproportion, breech presentations, placenta previa, and pre-eclampsia<sup>[9]</sup>. CS as a major

surgical procedure carries risk of serious complications and should be performed in the presence of specific and clearly defined indications<sup>[10]</sup>. The present study carried out to assess the CS rates; analyze the types; and to evaluate clinical indications, and perinatal outcome of CS performed in primigravidae (PG).

## Materials & Methods

A retrospective review of birth data for all patients (48326) having delivered at Misurata Central Hospital between 1st Jan. 2002 and 31st Dec. 2008; was performed. All PG who underwent CS (2221) were analyzed; informations on every delivery at the facility for the period of study were obtained come from 2082 women included in the survey who had singleton pregnancy. A further 139 women who were delivered by CS had multiple pregnancy. The data were collected from the records of the labor room and the medical records. Data selected for study included maternal age, prenatal care, complications of pregnancy, spontaneous or induced labour, indication for CS, types of CS, gestational age, birth weight, sex and Apgar scores of the neonate. Indications categories for CS including: dystocia, abnormal fetal heart rate pattern, malpresentations, maternal condition, placental complications. The most important indication was assigned to that patient. Statistical comparison have made where appropriate, test of difference of proportions using Z-score statistic at 5% of significance was used.

## Results

48326 deliveries identified including 717 multiple pregnancies during the seven years of study; of whom 10828 deliveries were primigravidae (22.4%). There were 7710 CSs among these deliveries giving an overall CS rate of 15.95%. Of the total primigravidae; 2221 underwent CS giving a rate of 20.5%, (figure 1). This rate was significantly increased ( $P < 0.0001$ ) as compared with primary CS (PCS) rate of the general obstetric population (10.9%) or with that of the multiparae (7.8%) during the period of study. The analysis revealed an increased CS rates; either for overall CS rate, overall PCS, or multiparous PCS rate (figure 2) with a dramatic increase in 2008 especially among primigravidae reaching 26.4%. These increases were significant ( $P < 0.05$ ) through out the period of study; comparing the years 2002 with 2005 and 2008.

Maternal age was ranged between 16 and 47 years, with a mean age of  $27.15 \pm 5.52$  years. 68.9% of the primigravidae were  $< 30$  years old (Figure 3). The rate of CS reviewed by maternal age and revealed that the lowest rate (13.5 %) was seen in the age group of 15-24 years old, then it twice rose steadily by ten-year age bands to 25.7 % in age group of 25-34 year and 64.4% in women aged  $\geq 35$  years. The differences were highly significant ( $P < 0.00001$ ). Further analysis of maternal age in relation to type of CS (Table 1) done and a significant ( $P < 0.05$ ) lower emergency CS was found among oldest age group (42.6%) than the younger groups (56.4% & 53% respectively). Of the total PG included in the study, 98.2% were booked and had regular

prenatal care and complications before or during pregnancy (Table 2) were recorded in 1303 cases (58.7%). Most of CS are carried out as emergencies either during labour (53% including 4% were induced); or before labour (18.2%), with 28.8% being undertaken as elective operations. Of the total CS (1177) performed as emergency procedure during labour, 48.7% were for dystocia and 30.7% for fetal distress. Dystocia was the main indication for 26.7% of all CS in the study group; in 72.7% of patients who operated because of dystocia labour was started spontaneously. The second dominant indication of CS was malpresentations, majority of them (81%) were breech presentatiseen (Table 3). While eclampsia and pre-eclampsia were frequent indications for emergency CS; infertility also plays a role in decision for CS (6.4%). The most common postpartum maternal morbidity was anaemia (12.5%) whereas postpartum haemorrhage recorded in 34 cases (1.5%). Peripartum hysterectomy was carried out for one patient indicated for uterine atony caused by severe placental abruption. 4 maternal deaths were reported giving a maternal mortality rate of 1.7/1000; due to Hellp syndrome, eclampsia, cardiomyopathy and septic shock.

Of the 2375 babies born to the PG, 20 intrauterine deaths and the live caesarean births were admitted routinely to neonatal intensive care unit; of whom 53% were males and 46.9% were females and 2 babies of undifferentiated sex. Table 4 shows the perinatal morbidity and mortality. The mean gestational age was  $38.7 \pm 2.2$  weeks, and preterm Caesarean births represented 14.5% whereas

postterm only 5.9%. The major clinical causes of preterm CS were pre- eclampsia (49.6%), and antepartum haemorrhage (12.4%). Birth weight was ranged between 900 and 5400 grams with a mean of  $3022.1 \pm 753.3$ gram. Low birth weight represented 15.4% of the total live births by CS, 49.6% of them were preterm and three/fourths

(67%) were operated as emergency indicated mainly for severe pre-eclampsia or eclampsia, and antepartum haemorrhage. Macrosomia accounted for 8.7% of the Cesarean births as shown in figure 4.

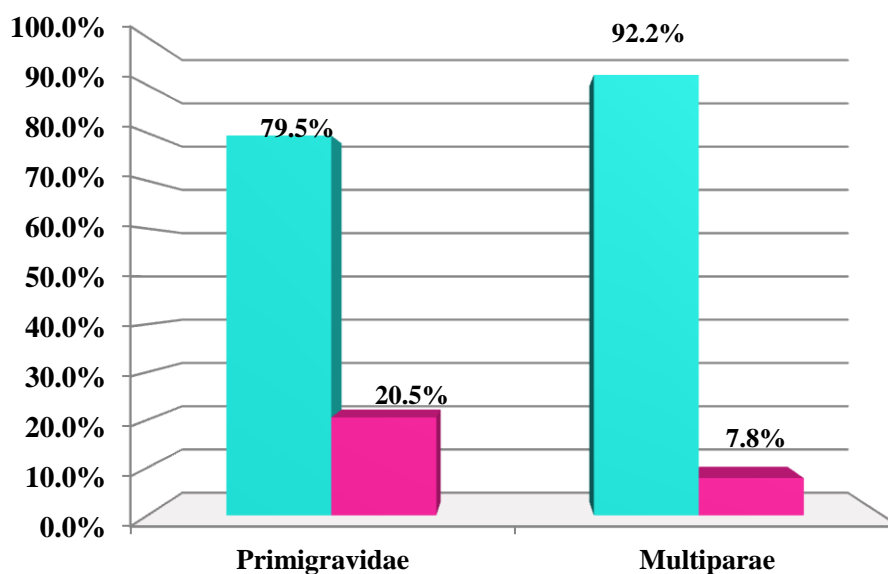


Fig. 1: Primary Cesarean section and parity

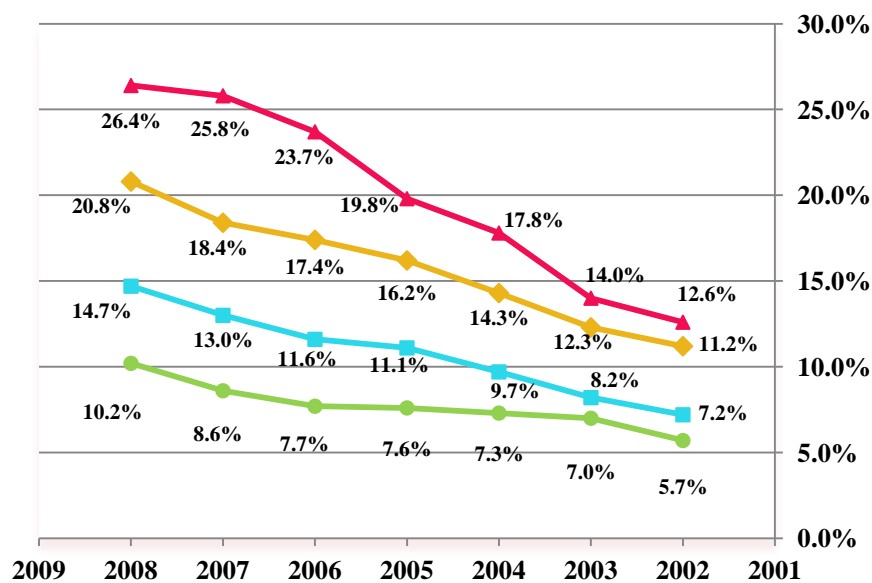


Fig. 2: Cesarean section rates in seven years

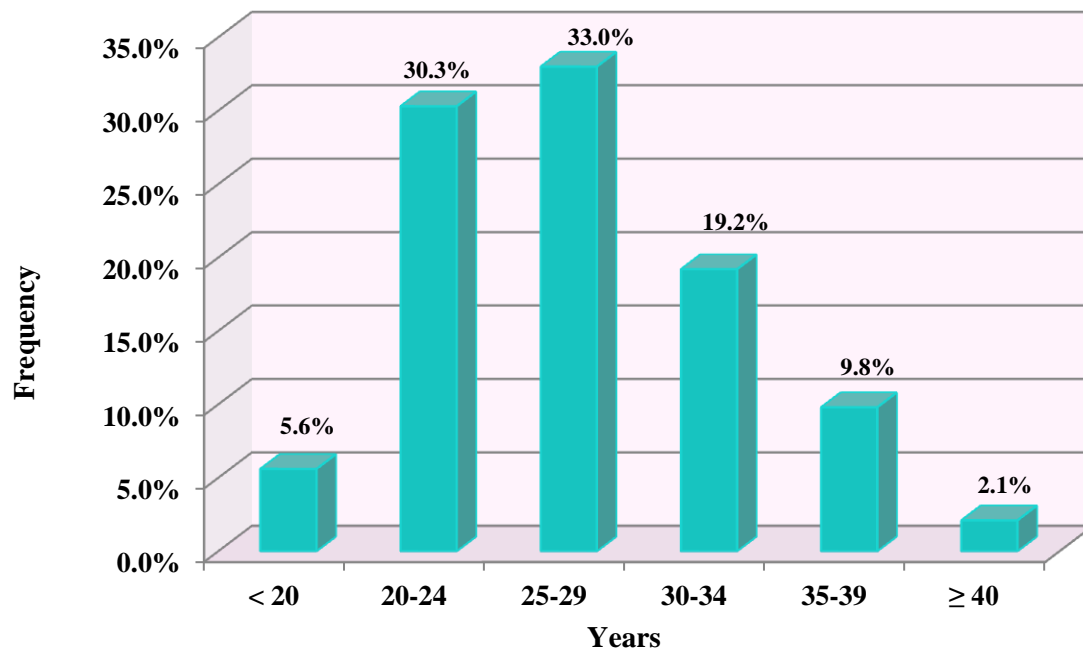


Fig. 3: Distribution of Cesarean section according to maternal age

Table 1: Types of CS in relation to maternal age

Type of CS/ maternal age (years)	16-24	25-34	35-47
Emergency CS during labor	450 (56.4%)	614 (53 %)	113 (42.6%)*
Spontaneous labor	417	565	109
Induced labor	33	49	4
No trial of Labor	348 (43.6%)	544(47%)	152 (57.4%)
Emergency CS before labor	158	207	40
Elective CS	190(23.8%)	337(29.1%)	112 (42.3%)*
<b>Total</b>	<b>798</b>	<b>1158</b>	<b>265</b>

\*; P < 0.05

Table 2: Pregnancy complications among primigravidae

Pregnancy complication	Primigravidae (1303)	Frequency (%)
<b>Relevant history</b>	<b>310</b>	<b>13.94%</b>
BOH	23	1.03%
Infertility	172	7.74
Advanced maternal age	115	5.17
<b>Maternal complications</b>	<b>76</b>	<b>3.4%</b>
Medical diseases	31	1.4
Diabetes	14	0.63
Surgical condition	14	0.63
Uterine fibroid	17	0.76
<b>Fetal complications</b>	<b>404</b>	<b>18.20%</b>
Breech/ Malpresentation	313	14.1
Pre-existing fetal compromise	61	2.74
Chorioamionitis	30	1.35
<b>Obstetrical complications</b>	<b>432</b>	<b>19.54%</b>
Pre-eclampsia / eclampsia	332	14.94
Antepartum hemorrhage	100	4.5
Combined complications	81	3.64%

Table 3: Primary indication of CS in primigravidae

Indications of CS	No. of cases (2221)	Frequency (100%)
Dystocia	593	26.7%
Breech / Malpresentation	515	23.2%
Fetal distress	475	21.4 %
Pre-eclampsia / eclampsia	165	7.4%
Infertility	142	6.4%
Elderly primigravidae	76	3.4%
Antepartum hemorrhage	75	3.4%
IUGR	37	1.7%
Bad Obstetrical History	23	1%
Medical- surgical condition	63	2.8%
Uterine anomaly	12	0.5%
Chorioamionitis	30	1.4%
Triplet/quadruplet	15	0.7%

Table 4: Perinatal outcome of CS in primigravidae

Perinatal mortality/ morbidity	Number	Frequency
Still Birth	20	2.8/1000
Early Neonatal Death	66	8.5/1000
Perinatal death	86	36.5/1000
Meconium Stained Amniotic Fluid	230	9.8%
Low Apgar Score	309	13.1%
Congenital Anomaly	20	0.8%
Low birth weight	363	15.4%
Macrosomia	204	8.7%
Prematurity	321	13.2%

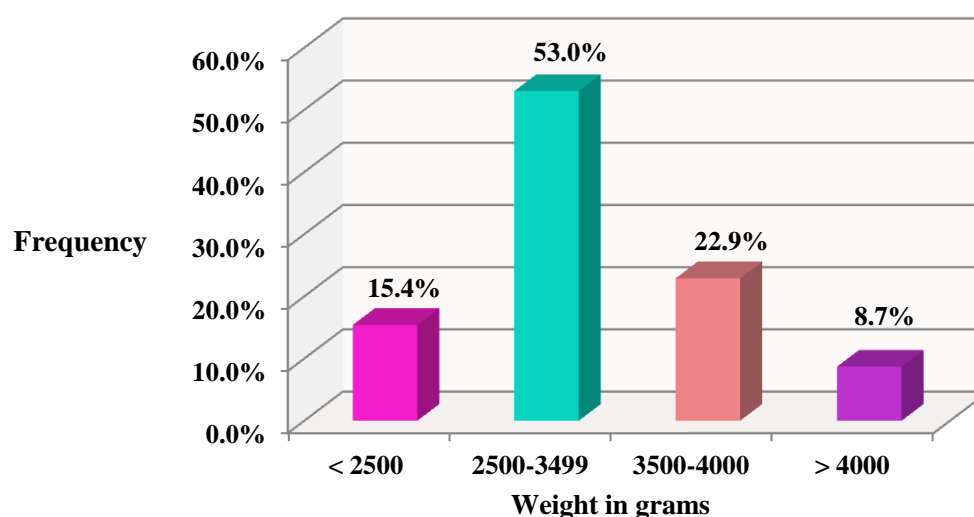


Fig. 4: Distribution of CS Births according to birth weight

### Discussion

Despite the known risks of Caesarean section; the rate has been increased in many centres around the world aiming improvement of pregnancy outcome. Identifying the factors that are associated with rising CS in nulliparous women may reduce the increased rate of CS in our locality which is changed by 109.5% along the period of present

study (2002-2008) explaining the annually increased primary CS rate. Shunji Suzuki <sup>[2]</sup> also found that one the reasons for the increasing Cesarean delivery rate are the increase in Cesarean delivery rates in the cases of nulliparity. Najmi <sup>[11]</sup>; found an increased CS rate among nulliparous women (27.3%) compared to multiparae (22.3%). The current study found CS

rate was 2.6 times higher in primigravidae compared to PCS in multiparae, similar finding recently reported by Mahmut Kiliç, 3.86 times more<sup>[12]</sup>.

CS rate in this study reached 26.4% which is lower than the 43.2% reported by Ojiyi E. et al.<sup>[13]</sup>, who found that primigravidae are high risk patients and should book for antenatal care and the hospitals adopt a comprehensive antenatal care. Also it is lower than the 36.7% reported by Geidam et al<sup>[14]</sup>; but is comparable with the 25% reported by Oladapo from Nigeria<sup>[15]</sup>; however; these high CS rates are unaccepted because of CS implications on the reproductive future of these patients, especially in where large family size is desired.

Elderly primigravidae accounted for 11.9%, they are considered to be high risk obstetric patients because of the complications associated with their pregnancies and deliveries<sup>[16,17]</sup>. It has suggested in previous studies that they are more prone to developing medical and obstetric complications in pregnancy<sup>[18]</sup> and in labour; they are also at increased risk of CS and instrumental vaginal delivery<sup>[16]</sup>.

While two-thirds of the CSs (63.3%) were performed in patients within the age range 20-29 years; a significant increase in the incidence of CS was associated with increased maternal age reaching 64.4% among elderly primigravidae. Goldman et al.<sup>[16]</sup>, Jirattigalachote and Prechapanich<sup>[19]</sup> also found a higher incidence of CS among them than the younger group. Older women are at higher risk for Cesarean delivery in part because they are more likely to have

Cesarean delivery without labor. However even among those women who labor; they are more likely to have CS; regardless of whether labor is spontaneous or induced. Part of the higher rate among older women who labor is explained by a higher rate of induction, particularly elective induction<sup>[20]</sup>. Additionally; elderly primigravidae pregnancies are often considered as precious pregnancies as less likely take risks with vaginal delivery. This explain the 42.3% of CS among oldest patients representing the “high-risk” group were performed electively compared to 23.8% of youngest age group which was reported previously by Gharoro & Igabfe<sup>[21]</sup>.

The increased CS rate in primigravidae found in this study resulted from various pregnancy and labor complications including pre-eclampsia, infertility, antepartum hemorrhage, cephalopelvic disproportion, fetal distress, and breech presentations. Dystocia was the main indication for 26.7% of all CS in the study group; in 72.7% of patients who operated because of dystocia labour was started spontaneously. Thus active management of labour in these primiparous women may reduce CS as such management program shortened the first stage and duration of labor in low-risk nulliparous women<sup>[22]</sup>. Nulliparae are at more risks of labor abnormalities that necessitating intervention<sup>[23]</sup>; because of the tissues of the reproductive tract have more resistance and the uterus tends to be less effective in maintaining uterine contractions. This may explain why dystocia is a common reason for intervention in nulliparous parturient, dystocia



was found to be indicated for nearly 50% of all Caesarean deliveries in nulliparae [24, 25].

Generally; breech presentation in nulliparous women is an indication for Cesarean section in our department and was the second dominant indication in present study; however; others reported that a proper selection of nulliparous women with breech presentation for vaginal delivery can avoid Cesarean section in the majority of cases without compromising the perinatal outcome and the concept of elective CS in all primigravid breeches at term should be reconsidered [26]. Fetal distress was another leading indication for CS among primigravidae, the rate can be safely reduced by reviewing and auditing the primary indication for CS and careful interpretation of fetal monitoring are necessary. The birth weight was also an important factor in Cesarean delivery, 15.4% of the total births were low birth weight and it is suggested that Cesarean birth is a safer route of delivery for lowbirth weight while macrosomia accounted for 8.7% of neonates; macrosomic infants had also been associated with unengaged fetal head, malpositioning and prolonged labor in nulliparae [27-30]. Infertility also plays a role in decision for CS (142) as 42.3% of them operated electively without trial for vaginal delivery.

### Conclusions

The CS rate in the primigravidae was significantly higher as compared to the obstetric population contributing to the rising of the overall PCS. Increasing maternal age is strongly associated with increased CS rates suggesting that older

primiparous women should be the goal of future efforts to control CS rates. Dystocia was the main indication of CS, thus applying guidelines of active management of labor in primiparous women may be the most valuable approach to reduce CS rates.

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