# Investigating the causes and prevalence of cesarean section among the primigravid women referred to Taleghani Hospital in Ilam, Iran

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## Abstract

**Introduction:** Cesarean Section (CS) is considered one of the most common surgeries in obstetrics and gynecology; it is, also, one of the methods of termination of pregnancy. This study aimed to investigate the prevalence and causes of CS among the primigravid women referred to Taleghani Hospital in Ilam located in western of Iran.

**Materials and methods:** This was cross-sectional (descriptive) study. All primigravid women who referred to Taleghani hospital in Ilam from October 2017 to April 2018 were included in study. Of the total 1738 deliveries performed during six months, 296 cases were related to primigravid women. The questionnaire was used as the research tool; it was completed through interviewing with women who referred to Taleghani hospital for delivery and reviewing patients' records. SPSS software version 20was applied to analayze the collected data using descriptive statistics.

**Results:** The findings showed that 867 (49.88%) and 871 (50.12%) deliveries of the total 1738 deliveries performed during the second half of 2017, were related to multiparous and primigravid women, respectively. Among the performed vaginal deliveries and CSs, 427 (49.25%) and 296 (33.98%) cases were related to nulliparous women, respectively; the incidence rate of CS among the nulliparous women was 33.98%. The mean age of subjects was 23.64 ±4.1 and the age group of 29-30 years old had the highest frequency (75.7%). In general, the fetal factors accounted for more than 67 percent of CSs of primigravid women.

**Conclusion:** This study showed that the CS was highly prevalent among primigravid women; the fetal factors were the most important causes of CS.

**Keywords:** Prevalence, Cesarean Section, Factors, Ilam.

## Introduction

The pregnant women deliver their babies either by vaginal birth or CS. Delivery is one of the most critical and important services of health system worldwide (1). CS delivery rate has increased around the world over the past few decades (2). For example, the rate of CS in industrialized and developing countries has increased to 46% from 1996 to 2006 (3). In USA, today, it is the second most common surgical procedure after the circumcision. This procedure not only has dramatically increased the cost of treatment, but it also has significantly increased the mortality and morbidity rate of mother and baby. In 2012,

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USA and Australia (30.3%) recorded the highest rate of CS among the developed countries and Chile (40%), Brazil, Korea (46%), Pakistan, India, and Turkey (25% to 40%) reported the highest rate of CS among the developing countries (4-6, 7, 8). Nowadays, the definitive indications of CS include cephalopelvic disproportion, breech, placenta Previa, placental abruption, umbilical cord prolapse, and severe pre-eclampsia (9) and the relative indications include fetal distress, labor arrest, multifetal pregnancy, very small and very large fetus size, breech (2), and women who have previously underwent CS (10); in general, these are the situations which influence the life of mother or fetus. The probable rate of CS at all births was estimated to be 5.8% to 8.4% (9). A survey in Netherlands showed that women who are willing to have CS can always find a gynecologist who performs CS for non-medical reasons (11). Even in some communities, it is gradually becoming a fanciful procedure and, of course, its causes have not been identified yet; some cite probable causes such as fear of litigation and criminal convictions (12, 13), fear of labor pain and prior bad vaginal delivery experience (13), high maternal age at first pregnancy, advising CS due to breech, decreased forceps and vacuum use, increased labor induction, worrying of pelvic injury, reducing fetal injury risk, using fetal heart monitoring, increased prevalence of obesity, and disability for vaginal birth after CS (12, 13). These inappropriate causes, however, have increased the cost of health care in CS compared to the vaginal birth. The high rate of CS is a global problem; the CS is highly prevalent even in countries which have an access to better health indicators and services than Iran does. From 1970 to 2007, the rate of CS in United States has increased from 4.5% to 38% (12). Since the prevalence and causes of cesarean section in primigravid women in Ilam have not been reported yet, time and place are important in cross-sectional studies. Hence, this study aimed to investigate the prevalence and causes of CS among primigravid mothers in order to determine its primary causes and reduce the complications of CS and the costs.

## Materials and methods

The present study was carried out as a cross-sectional (descriptive) study. All nulliparous women who referred to Taleghani Hospital in Ilam from October 1986 to April 1997 were included in the study. The data were collected using a researcher-made checklist; its validity was confirmed by experts and also its reliability was verified through split-half method (Cronbach's alpha= 0.90). In summary, the CS causes were found to be associated with uterus (prior CS experience, failure to respond to labor induction, failure to progress in labor, and abnormalities of uterus), placenta and embryo (erythroblastosis neonatorum, polyhydramnios and oligohydramnios, placenta previa, placental abruption, multifetal pregnancy, fetal distress, macrosomia, fetal growth restriction, breech, and meconium excretion), birth canal (cystocele-rectocele repair, pelvic stenosis, prior bad labor experience, uterine cerclage, uterine anomaly, and cephalopelvic disproportion), and maternal diseases (heart disease, pre-eclampsia, ophthalmic and orthopedic diseases, and infertility). For privacy purposes, the data were recorded via record number of subjects. Having been granted permission from hospital officials, the delivery records were reviewed to identify the nulliparous women. Considering research objectives, then, the researcher and midwifery experts collected the data of their records were the variables of vaginal birth and CS and causes of CS were analyzed. The data were analyzed using descriptive statistics (central indices for quantitative variables and absolute and



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cumulative frequency and percentage of dispersion frequency for qualitative variables) at SPSS software, 20. The tables and charts were also used to process the data.

## Results

The findings showed that of the total 1738 deliveries performed during the second half of 2017, 867 (49.88%) and 871 (50.12%) deliveries were related to multiparous and primigravid women, respectively. Among the performed vaginal deliveries and CSs, 427 (49.25%) and 296 (33.98%) cases were related to primigravid women, respectively. The mean age of subjects was 23.64 ±4.1 and the 29-30 years old age group had the highest frequency (75.7%). Also, 5.*1*% of subjects attended training sessions and 80.7% were housewives (Table 1).

The findings also showed that the failure to progress in labor (among the maternal factors) and pelvic stenosis (among the maternal-fetal factors) were ranked the most important causes of CS. Among the fetal factors, the fetal distress and Mas were found to be the most important causes of CS (Table 2). So, the fetal factors accounted for over 67% of CSs among primigravid women. The highest blood pressure was reported at pre-eclampsia, IUGR, and macrosomia conditions (Table 3). The highest age at pre-eclampsia and infertility was 25.2± 4.29 and 29.57± 5.53 years old, respectively (Table 4). The highest weight gain was among women with failure to progress in labor (37.39 ± 4.18) and CPD (36.5 ± 4.62) (Table 5).

**Table 1.** Demographic characteristics of participants.

| Demographic characteristics | | Frequency | Percentage |
|---|---|---|---|
| **Time of Caesarean section (Month)** | | | |
| | October | 56 | 18.9 |
| | November | 57 | 19.3 |
| | December | 44 | 14.9 |
| | January | 45 | 15.2 |
| | February | 45 | 15.2 |
| | March | 49 | 16.6 |
| | Total | 256 | 100 |
| **Age** | | | |
| | <20 | 49 | 16.6 |
| | 20-30 | 224 | 75.7 |
| | >30 | 23 | 7.8 |
| | Total | 256 | 100 |
| **Attend a training class** | | | |
| | Yes | 15 | 5. 1 |
| | No | 281 | 94.9 |
| | Total | 256 | 100 |
| **Employment status** | | | |
| | Self-employed | 13 | 4.4 |
| | Housewife | 239 | 80.7 |
| **Employee** | Employee | 27 | 9.1 |
| | Student | 17 | 5.7 |
| | Total | 256 | 100 |

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**Table 2.** Frequency of CS causes among primigravid women.

| Cause of cesarean section | | Frequency | Percentage |
|---|---|---|---|
| **Maternal factors** | | | |
| | Failure to progress in labor | 62 | 20.9 |
| | Pre-eclampsia | 15 | 5.1 |
| | Infertility | 7 | 2.4 |
| | Total | 84 | 28.4 |
| **Maternal-fetal factors** | | | |
| | Pelvic stenosis | 12 | 4.1 |
| | Total | 12 | 4.1 |
| **Fetal factors** | | | |
| | Placental abruption | 13 | 4.4 |
| | Breech | 38 | 12.8 |
| | Placenta Previa | 14 | 4.7 |
| | Multifetal pregnancy | 12 | 4.1 |
| | Fetal distress | 60 | 20.3 |
| | MAS | 57 | 19.3 |
| | Low weight relative to gestational age | 2 | 0.7 |
| | Macrosomia | 4 | 1.4 |
| | Total | 200 | 67.5 |

MAS: Meconium aspiration syndrome.

**Table 3**. Hypertension status among primigravid women who underwent CS regarding the causes.

| Cause of cesarean section | Frequency | Systolic hypertension | Diastolic hypertension |
|---|---|---|---|
| Placental abruption | 13 | 105.38±15.47 | 69.84±5.82 |
| Fetal distress | 60 | 110.71±13.8 | 72.16±4.44 |
| Breech | 38 | 104.86±12.32 | 71.44±5.8 |
| MAS | 57 | 100.35±18.91 | 69.82±6.12 |
| Failure to progress in labor | 62 | 110.24±10.65 | 71.45±6.16 |
| Pre-eclampsia | 15 | 158.68±8.9 | 88.13±17.83 |
| Placenta Previa | 14 | 108.21±34.11 | 67.14±11.21 |
| Multifetal pregnancy | 12 | 102.08±10.75 | 70.83±6.33 |
| IUGR | 2 | 130 | 75±7.07 |
| CPD | 12 | 107.5±9.88 | 70.41±5.41 |
| Macrosomia | 4 | 113.75±18.87 | 75±5.77 |
| Infertility | 7 | 107.85±9.94 | 70±10 |

Data are shown as mean ± SD and percent. MAS: Meconium aspiration syndrome, IUGR: Intrauterine growth restriction, CPD: Cephalopelvic disproportion.

**Table 4.** Mean age of primigravid women who underwent CS regarding the causes.

| Cause of cesarean section | Frequency | Mean | Standard deviation |
|---|---|---|---|
| Placental abruption | 13 | 23.15 | 3.02 |
| Fetal distress | 60 | 23.36 | 4.3 |
| Breech | 38 | 23.02 | 3.94 |
| MAS | 57 | 24.03 | 4.22 |
| Failure to progress in labor | 62 | 22.8 | 3.58 |
| Pre-eclampsia | 15 | 25.2 | 4.29 |
| Placenta Previa | 14 | 24.28 | 3.19 |
| Multifetal pregnancy | 12 | 23.83 | 3.71 |
| IUGR | 2 | 21 | 4.24 |
| CPD | 12 | 24.58 | 4.29 |
| Macrosomia | 4 | 22.5 | 4.65 |
| Infertility | 7 | 29.57 | 5.53 |

MAS: Meconium aspiration syndrome, IUGR: Intrauterine growth restriction, CPD: Cephalopelvic disproportion.



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**Table 5.** BMI status of primigravid women who underwent CS regarding the causes.

| Cause of cesarean section | Frequency | Primary BMI | Secondary BMI |
|---|---|---|---|
| Placental abruption | 13 | 25.88±3.56 | 27.4±3.52 |
| Fetal distress | 60 | 27.89±5.11 | 29.86±5.29 |
| Breech | 38 | 29.37±5.4 | 31.4±5.59 |
| MAS | 57 | 26.14±4.3 | 28.15±4.31 |
| Failure to progress in labor | 62 | 31.93±3.9 | 37.39±4.18 |
| Pre-eclampsia | 15 | 27.77±5.62 | 29.69±5.7 |
| Placenta Previa | 14 | 29.54±4.75 | 31.47±4.84 |
| Multifetal pregnancy | 12 | 27.49±4.49 | 33.33±5.05 |
| IUGR | 2 | 26.92±3.51 | 28.61±3.08 |
| CPD | 12 | 31.26±4.1 | 36.05±4.62 |
| Macrosomia | 4 | 35.07±3.58 | 36.79±3.66 |
| Infertility | 7 | 26.26±3.35 | 27.84±3.41 |

BMI: Body mass index, MAS: Meconium aspiration syndrome, IUGR: Intrauterine growth restriction, CPD: Cephalopelvic disproportion.

## Discussion

CS is a childbirth procedure which is performed in emergency situations; thus,it should not be considered as a replacement for vaginal birth. The complications of CS made the World Health Organization announce that the desirable CS rate is 15% in 2000. Unfortunately, the CS rate is high in Iran (15). The present study found that 50.12% of deliveries were performed using CS. Of the total 1738 deliveries performed during the second half of 2017, 867 (49.88%) and 871 (50.12%) deliveries were related to multiparous and primigravid women, respectively. Among the performed vaginal deliveries and CSs, 427 (49.25%) and 296 (33.98%) cases were related to primigravid women, respectively. The studies in Iran have shown that, the incidence of CS among nulliparous women and multiparous women in the early 1990s was 26.8% and 25.5%, respectively; this rate was 87% and 15-39% in nonpublic hospitals and public hospitals, respectively (14). The present study showed that the incidence rate of CS is 50.1%. Bahonar et al. found that the CS rate in Damghan is 51.4% (15); Movahed et al. showed that the CS rate is 47.2% (16); Nurizadeh et al indicated that the CS rate is 33.1% (17); and Negahban determined the CS rate to be 31.25% (18). Chong et al. showed that 3.7% of women in Singapore preferred CS to their normal delivery (19). Graham showed that the CS rate in Scotland is 7% (20); it was 14.9% in Lithuania in 2011 (21). In a study (2010) on Swedish pregnant women, it was found that 7.6% of women in mid-pregnancy period and 7% in late-pregnancy period preferred CS (21). The studies in United Kingdom, America, and South America showed an increase in the CS rate (6). However, some other countries have been successful in controlling CS (22). The rate of CS in Iran is notably significant in comparison to these countries; this difference may be explained in terms of health system performance, socio-cultural status, awareness of pregnant women in these communities, and delivery facilities at health centers.

Among maternal factors, the frequency of failure to progress in labor was reported to be 20.9%; among fetal factors, the frequency of fetal distress was reported to be 20.3%; and among fetal-maternal factors, the frequency of CPD was reported to be 4.1%. The frequency of housewives who preferred CS was 239 (80.7%).

In present study, the 20-30-year-old age group had the highest frequency (75.7%). This is consistent with Kashanizadeh`s study; the 25-31-year-old group had the highest frequency (23). The highest age at pre-



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eclampsia and infertility was 25.2± 4.29 and 29.57± 5.53 years old, respectively.

This study showed that the most common clinical causes of CS include failure to progress in labor (20.9%), fetal distress (20.3%), MAS (19.3%), and breech (12.8%). Soltani et al. reported that the most common clinical causes of CS were the fetal distress (42%) and failure to progress in labor (10%) (24).

The average pregnancy weight gain was estimated to be 8.02. This is similar to the figures provided for the developing countries. The average pregnancy weight gain in the developed countries is more than 10.5 kg and in some countries such as United Kingdom is 12.5 kg (12).

## Conclusion

This study showed that the CS was highly prevalent among primigravid women; the fetal factors were the most important causes of CS.

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