Original Article

Frequency of, and indications for the first time C-section in Zanjan, Iran

Elham Shakibazadeh1*, Rana Bayat2, Azam Tahernejad2, Sonia Sepehri2

1 Department of Midwifery, School of Nursing and Midwifery, Zanjan University of Medical Sciences, Zanjan, Iran
2 Department of Midwifery, School of Nursing and Midwifery AND Student Research Committee, Zanjan University of Medical Sciences, Zanjan, Iran

Background & Aim: The causes of increased rate of Cesarean section (C-section) are not completely known. The repeated C-sections are frequently reported in studies conducted in Iran. This study aimed to determine the frequency of, and indications for the first time C-section (FCS) in Zanjan, Iran in 2012-2013.

Methods & Materials: A cross-sectional study was conducted and systematic random sampling was used to select medical records of delivered women. We provided a self-structured short questionnaire. Data were collected from the medical records and analyzed using independent sample t-test, and Chi-square test.

Results: A total of 4563 women have been delivered during the period of the study from which 1928 cases (42.25%) underwent C-section. Among women who had C-section, 1144 cases (59.3%) underwent first time C-section. The three most frequent indications for FCS were prolonged labor (35.2%), meconium staining (22.2%), and fetal distress (21.9%).

Conclusion: The frequency of FCS is high in Zanjan, Iran. Adequate following up programs to diminish the percentage of first time C-section and increase the number of vaginal birth would significantly reduce the prevalence of C-sections.

Introduction

Over the last several years, the rate of Cesarean section (C-section) has dramatically increased worldwide (1). The rate of increase in the European countries has been reported from 13 to 25% (2); and in developing countries from 4.7% in Azerbaijan up to 18.6% in Jordan and 27.6% in Egypt (3). In Iran, the national study of multiple indicators of health and population in the year 2010 has reported that the rate of C-section was 35% of all deliveries in 2000 (4). This rate is higher than the amount reported in developed countries such as the United States (30.2%) and the United Kingdom (22%) (3). The causes of increased frequency of C-section are not completely known. It has been shown that 50% of nulliparous women, and more than 25% of women aged over 30 years had C-sections. Moreover, more than 85% of breech presentations terminated with the C-section (5,6). There are many and complex causes of the rise in the C-section rates worldwide. The procedure has inherent negative consequences (short- and long-term) for mother and child, as well as being an economic burden to society. There are variety of reasons to attempt prevention of a further increase in C-section rates. Although some studies have highlighted maternal benefits of the C-sections (7), several other studies have indicated C-sections generally tend to be more costly than vaginal deliveries (8); and associated with higher rates of maternal re-hospitalization and postpartum medical care utilization (9,10). Some studies have shown potentially worse neonatal outcomes for C-section deliveries, including elevated risk of mortality (11). The complications of the C-section are including bleeding, infection, pulmonary emboli, and anesthetic side-effects (12). Moreover, the mortality rate of the C-section (5.8%) is 26 times more than that of the normal vaginal delivery (13).

ARTICLE INFO

Received 23 October 2013
Revised 17 December 2013
Accepted 4 February 2014
Published 25 December 2014

Available online at: http://npt.tums.ac.ir

Key words: C-section, indication, first time Cesarean section, frequency

Nursing Practice Today


* Corresponding Author: Elham Shakibazadeh, Postal Address: School of Nursing and Midwifery, Zanjan University of Medical Sciences, Zanjan, Iran Email: shakib@zums.ac.ir

Please cite this article in press as: Shakibazadeh E, Bayat R, Tahernejad A, Sepehri S. Frequency of, and indications for the first time C-section in Zanjan, Iran. Nursing Practice Today. 2014; 1(4):207-212
According to the WHO in "healthy people 2010" program, the rate of C-section in 2010 reached to 15% of total deliveries (14,15). This means that a maximum of 15% of pregnant women who are not able to have a safe natural childbirth should undergo C-section and accept its risky complications.

In Iran, the Ministry of Health and Medical Education has provided mother-friendly hospitals in which preparatory pregnancy classes are held for pregnant women. Moreover, a reform has been placed in educational curriculum of obstetrics residents and midwifery students to promote normal vaginal delivery. Such measurements have not been effective to help the planners to reach the specific target rate of less than 25% in private hospitals and less than 20% in public hospitals (16-18). In a study in 2002, the rate of the C-section was 66.5% in Tehran (19). In another study by Shakeri et al in Zanjan, the rate of C-section was 43% among which 43% were elective C-sections. The most influential factor on the high rate of C-section was repeated C-sections (57.8%) (20). In one study in the Baqiatallah Hospital in Tehran, the most important cause for C-section was a history of C-section (21). It is worth noting that in most of C-section prevalence studies in Iran, the first time C-section (FCS) is not reported as an indication and thus the rate of the FCS is under-estimated.

Since the repeated C-sections are the most reported indication of C-sections in studies conducted in Iran, and in order to design effective programs for reducing the frequency of C-section, knowing the rate of and indications for the FCS is necessary. In this study, we aimed to determine the frequency of, and indications for FCS in Zanjan, Iran in 2012-2013.

Methods

We have conducted a cross-sectional study. We derived data from medical records of women who had undergone C-section from March 2012 to March 2013 in Moosavi Hospital in Zanjan. The Moosavi Hospital is the only teaching and public hospital affiliated to the Zanjan University of Medical Sciences which has a maternity unit. It is a large specialized hospital with a large number of deliveries per year. There are no private hospitals in Zanjan by now.

We reviewed the whole medical records of the women who had been delivered during a 1-year period in the hospital (n=4563) to find the percent rate of the FCSs. Then we used the below sample size formula to calculate the size of the FCS population in the study in order to measure the frequency of the indications and provide external validity of the study. We were supposed to have at least 324 individuals in our study:

\[ n = \frac{z^2 \cdot p \cdot q}{d^2} = \frac{1.96^2 \cdot 0.3 \cdot 0.7}{0.1^2} \]

We used systematic random sampling to select medical records. We calculated K by dividing the total number of C-sections during the time of the study (n=1928) to the calculated sample size (n=324) (K=6). We selected the medical records of the FCS women in a 6-order.

The inclusion criteria were all women who underwent FCS during the study period. We provided a short questionnaire including women's age, residential area, gravidity, history of sub-fertility, neonates' weight, and maternal indications of the FCS; the variables that their data were found via medical records. The validity of the questionnaire was assessed using the expert panels' opinion. If the data were insufficient, we asked for more details via telephone from the women and completed the questionnaires.

The study was approved by the Ethics Committee of the Zanjan University of Medical Sciences. All data remained confidential.

Statistical analysis included independent sample t-test, and Chi-square test. Significance level was considered to be p<0.05. Data were analyzed using the SPSS v.16.

Results

Of 4563 women who have been delivered during a 1-year period in the hospital, 1928 cases (42.25%) underwent C-section. Among women who had C-section (n=1928; 42.25%), 1144 cases (59.3%) underwent FCS. Most of the women who underwent C-section were from rural area (52.2%) and were primigravida (64.1%). Most of the women (54.8%) aged 20-30 years old; and 10.2% of women undergone C-section had a history of infertility. Only 1.5% of the Cesarean surgeries were due to a golden baby.
According to the calculated sample size, we finally studied 407 medical records out of the 1144 cases to determine the most frequent indications for the FCS. As it is shown in the Table 1, the three most frequent indications for FCS were prolonged labor (35.2%), meconium staining (22.2%), and fetal distress (21.9%).

Table 1. Frequency of the causes of the first time C-sections among women delivered by surgery in Moosavi Hospital in Zanjan, 2012-2013

<table>
<thead>
<tr>
<th>C-section indication</th>
<th>N</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prolonged Labor</td>
<td>114</td>
<td>35.2</td>
</tr>
<tr>
<td>Meconium staining</td>
<td>72</td>
<td>22.2</td>
</tr>
<tr>
<td>Fetal distress</td>
<td>71</td>
<td>21.9</td>
</tr>
<tr>
<td>Breech Presentation</td>
<td>30</td>
<td>9.3</td>
</tr>
<tr>
<td>Twin Pregnancy</td>
<td>23</td>
<td>7.1</td>
</tr>
<tr>
<td>Prolonged PROM</td>
<td>17</td>
<td>5.2</td>
</tr>
<tr>
<td>Severe Pre-eclampsia</td>
<td>17</td>
<td>5.2</td>
</tr>
<tr>
<td>Abnormal Fetal Presentation</td>
<td>9</td>
<td>2.6</td>
</tr>
<tr>
<td>Cephalo-Pelvic Disproportion</td>
<td>8</td>
<td>2.5</td>
</tr>
<tr>
<td>Mild Pre-eclampsia</td>
<td>7</td>
<td>2.2</td>
</tr>
<tr>
<td>Oligohydramnios</td>
<td>5</td>
<td>1.5</td>
</tr>
<tr>
<td>Golden baby</td>
<td>5</td>
<td>1.5</td>
</tr>
<tr>
<td>Discopathy</td>
<td>4</td>
<td>1.2</td>
</tr>
<tr>
<td>Macrosomia</td>
<td>4</td>
<td>1.2</td>
</tr>
<tr>
<td>IUGR</td>
<td>3</td>
<td>0.9</td>
</tr>
<tr>
<td>Placenta Decolman</td>
<td>2</td>
<td>0.6</td>
</tr>
<tr>
<td>Placenta Previa</td>
<td>2</td>
<td>0.6</td>
</tr>
<tr>
<td>Others</td>
<td>14</td>
<td>4.3</td>
</tr>
</tbody>
</table>

According to our study, only 10.2% of women who underwent FCS had a history of infertility and only 1.5% of surgeries were due to a golden baby. In a study by Shakeri et al in Imam Hosein Hospital in Zanjan, they reported a significant relationship between the rate of C-sections and history of infertility (20). It was likely due to performing elective surgeries for women with history of infertility. We could not investigate this relationship; because the elective C-sections are banned in our hospital and history of infertility is not formal as a recordable cause for the C-sections.

We found prolonged labor as the most prevalent cause for the FCS. Although, prolonged labor is an indication of the C-section, sometimes diagnosis of the prolonged labor is not well documented. In a study conducted by Maaloe et al in 2012, to audit the quality of obstetric management preceding emergency C-sections for prolonged labor, the researchers showed suboptimal management in most cases. Inadequate non-invasive

Table 2. First three indications of the FCS with women's age, neonates' weight, and history of infertility in Moosavi Hospital in Zanjan, 2012-2013

<table>
<thead>
<tr>
<th>Variables</th>
<th>Prolonged labor</th>
<th>p-value</th>
<th>Meconium staining</th>
<th>p-value</th>
<th>Fetal distress</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women's age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤20</td>
<td>18</td>
<td>31</td>
<td>0.36*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21-30</td>
<td>67</td>
<td>109</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31-40</td>
<td>26</td>
<td>64</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥41</td>
<td>1</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neonates' weight (Mean±SD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>History of Infertility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>11</td>
<td>22</td>
<td>0.74*</td>
<td></td>
<td></td>
<td>0.051*</td>
</tr>
<tr>
<td>no</td>
<td>102</td>
<td>187</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Chi-squared test **t-test
interventions were used to avoid operative delivery. In 26% of the cases, labor was not prolonged, and in 16% the membranes were still intact, when deciding on C-section. (23). In Moosavi Hospital, partogram is presented for all women; however, it is not seriously considered for decision-making for the type of delivery.

Meconium staining of the amniotic fluid is a common complication during labor. The second cause for the C-section in our study was meconium staining. Meconium-stained liquor during labor affects 5%–25% of all deliveries (24). When facilities like electronic monitoring are available in labors such as our studied unit, it is not difficult to decide whether labor should be allowed to continue or C-section should be performed. However, even when C-section is performed, meconium aspiration syndrome (MAS) can occur and cause considerable morbidity and mortality in newborn. Amino infusion is being considered as useful in decreasing MAS and its sequel. In a study by Choudhary et al, to evaluate the safety and efficacy of transcervical amnioinfusion during labor complicated by meconium-stained amniotic fluid, in a setting with limited peripartum facilities, to lower the incidence of C-section, they concluded that transcervical amnioinfusion in labor for meconium-stained amniotic fluid is a simple, safe and easy-to-perform procedure. They concluded that it can be performed safely in a setup with limited peripartum facilities (especially in developing countries) to decrease intrapartum operative intervention and reduce feto-maternal morbidity and mortality (25).

The third common reason for the FCS in our study was fetal distress. In our teaching hospital, monitoring is a part of women's admission procedure and a component of the management of high risk pregnancies. This may over diagnose the fetal distress and lead to unnecessary C-sections with fetal indication. Intrapartum hypoxia complicates about 1% of labors and results in death in about 0.5 in 1000 pregnancies and cerebral palsy in 1 in 1000 pregnancies (26). Processes such as uteroplacental vascular disease, reduced uterine perfusion, fetal sepsis, reduced fetal reserves, and cord compression are among multifactorial causes of intrapartum hypoxia (27). Methods of screening and diagnosing the condition have limitations. Thus when the condition is diagnosed clinically as “fetal distress,” clinicians should swiftly deliver because they lack a clear understanding of the severity of the hypoxia.

To date, we could not find any studies on the indications of the FCS; however, several studies have been conducted on identifying indications for the C-sections, in general. The results on the identified indications are consistent with ours. For example, Kolas et al, investigated the indications for Cesarean deliveries in Norway. Fetal stress (21.9%), failure to progress (20.7%), previous Cesarean delivery (8.9%), breech presentation ≥34 weeks of gestation (8.4%), maternal request (7.6%), preeclampsia (6.2%) and failed induction (4.0%) were the most cited indications for Cesarean deliveries. Of the total deliveries, 64.3% were emergency operations (28).

One of the limitations of our study was that the only source to collect the data was women's medical records and the indications recorded by the obstetricians in the medical files. It might depict a non-exact cause of the C-section. Moreover, we had only access to a limited number of variables recorded in the medical files. In other studies, nonmedical factors were also suggested for the widespread and continuing rise of the Cesarean rate including maternal demographic characteristics (e.g., older maternal age), physician practice patterns, more conservative practice guidelines, legal pressures, C-section requested by the mother, fear of litigation among caregivers and inappropriate organization of maternity care (29-31). As in the hospital which we collected the data, elective Cesarean delivery was banned, we could not study non-medical indications. The strength of the study was focusing on an important issue in health care system.

According to the aim of the study to use the data in program planning to decrease the rate of the C-sections, it is shown that the repeated Cesarean is the most prevalent indication of the C-sections. Therefore, planning for decreasing FCS using management of high risk cases can help to decrease the rate of the C-sections.

The frequency of the FCS was high in Zanjan, Iran. Adequate following of programs to diminish the percentage of FCS and increase the number of vaginal birth would significantly reduce the prevalence of C-sections.
First time C-section in Zanjan

Acknowledgment
We would like to thank the Vice-Chancellor for Research at Zanjan University of Medical Sciences for providing financial support. We would also like to thank Mossavi Hospital staffs who kindly helped us in conducting current study.

Conflict of Interests
The authors declared no conflict of interest.

References


