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Research Article

Rate and Indications of Cesarean Section Over a Seven-Year Period at Sina Public Hospital in Ahvaz, Sothern Iran

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Abstract

Introduction: The World Health Organization has recommended that the optimal cesarean delivery rate should be 10 - 15% of total deliveries. But statistics published in many parts of the world are very different and much higher. The aim of this study was to determine the rate and indications of cesarean section over a seven year period in Sina Hospital in Ahvaz, Iran.

Method: The present study was a cross-sectional descriptive-analytical study that was performed on all delivery records from 2013 to the first six months of the 2019. The variables of delivery type, cesarean section rate, number of cesarean in nulliparas and number of primary cesarean in multiparas were evaluated. The data were entered into SPSS ver. 16 and analyzed using descriptive statistics.

Results: A total of 32900 medical records were reviewed. The mean cesarean section rate was 32.41%. The lowest rate of cesarean section was in 2014 with 28.04% and the highest one was in 2017 with 35.34%. The most frequent indications for cesarean section were related to repetitive cesarean and fetal distress, respectively. Other indications included non-cephalic presentation, lack of progression of labor, multiple pregnancy, preeclampsia, placental problems, cesarean section without scientific indications, and other causes.

Conclusion: The rate of cesarean section in our study is higher than that recommended by the World Health Organization but lower than the average cesarean section in Iran. Repetitive cesarean section was the most common indication for cesarean section, suggesting the need for training, counseling, and trial of vaginal delivery after cesarean section.

Keywords: *Cesarean Section; Cesarean Section, Repeat; Prevalence; Indication*

Introduction

The World Health Organization (WHO) has suggested that the optimal cesarean delivery rate should be 10 - 15% of all deliveries and no more justification [1], but statistics published in many parts of the world are very different and much higher [2,3]. According to WHO statistics, about 18.5 million cesareans are performed worldwide each year. The results of a study on 137 countries around the world show that cesarean rates in about 40% of countries (most African countries, India, Pakistan, Indonesia, Yemen, Tajikistan, Philippines, Turkmenistan, Azerbaijan, Oman, Vietnam, etc.) was Less than 10%. In 10% of countries (Netherlands, Saudi Arabia, Kuwait, Guatemala, Maldives, Ukraine, Syria, etc.) it was about 10 - 15% and in 50% of countries (most European and American industrialized countries, Iran, Egypt, Jordan, Cuba, Bolivia, Qatar, Lebanon, Turkey, etc.) was more than 15% [2].

According to a WHO report released in 2010, the average rate of cesarean section in Iran was 41.9% [2]. Also, the findings of a meta-analysis by Rafiei., *et al*. in 2018 showed that the prevalence of cesarean in Iran was estimated at 48% [4].

Cesarean section is a major surgery that has a higher risk of complications such as maternal death [5,6], bleeding [7-9], infection [7,8], need for blood transfusion [9], dense internal adhesions [10], thromboembolism [6], Urinary retention [6,11], bladder injury [6,12] and anesthesia [6,13,14] than normal delivery. In addition, fertility decline following non-elective cesarean section has also been reported [15]. A systematic review study showed that women who have had cesarean section have fewer children than those who have had a vaginal delivery and in women undergoing cesarean section, the relative risk of post-cesarean infertility was 1.5 [16]. Increasing the rate of cesarean delivery in a country also imposes high costs on the health system. According to the WHO report in 2008, 373372 unnecessary cesarean sections were performed in Iran and the total cost of cesarean section in Iran was $ 108.495.217 [2].

Aim of the Study

The aim of this study was to determine the rate and indications of cesarean section over a seven year period in Sina Hospital in Ahvaz, Iran.

Methods

The present study was a cross-sectional descriptive-analytical study which was performed in Sina Hospital of Ahvaz, Iran in 2019. This place is a public and educational hospital affiliated with Ahvaz Jundishapur University of Medical Sciences that was established in 1964.

After receiving permission from the hospital authorities, the researchers referred to the Medical Records unit of hospital and evaluated all birth records from March 2013 to September 2019. Census method was used to determine sample size. Data gathering tool was a self-made form that included variables such as year, type of delivery and indication of cesarean section, cesarean section rate in nulliparas and primary caesarean section in multiparas. The content validity of data collection tool was approved by a number of experts prior to use. To ensure the reliability of the tool, the data collection form was completed by two researchers for ten samples and the correlation coefficient between observers was determined. The only criterion for inclusion in the study was delivery over 24 weeks of gestation (vaginal delivery or cesarean section). After completing the data forms, the data were entered into SPSS software version 16 and analyzed using descriptive statistics.

Results

A total of 32,900 medical records were reviewed from March 2013 to September 2019. The average of cesarean section rate during these seven years was 32.41%. The number and percentage of total cesarean sections, cesarean section rate in nulliparas and primary caesarean section in multiparas are shown in table 1 and figure 1 and 2 respectively. The lowest rate of cesarean section was in 2014 with 28.04% and the highest rate was in 2017 with 35.34%. The mean of cesarean section rate in nulliparas was 19.36%.

	Year							Total
	2013	2014	2015	2016	2017	2018	2019*	
Total deliveries	3339	4354	5331	5848	5973	5635	2420	32900
Vaginal deliveries	2246	3133	3631	3910	3862	3816	1636	22234
Cesarean sections	1093	1221	1700	1938	2111	1819	784	10666
Cesarean section in nulliparas	273	219	321	394	461	309	115	2092
Primary caesarean section in multiparas	230	195	269	240	364	292	158	1748

Table 1: *Number of deliveries (vaginal-cesarean) in the years 2013 - 2019.*

**: The first six months of the year.*

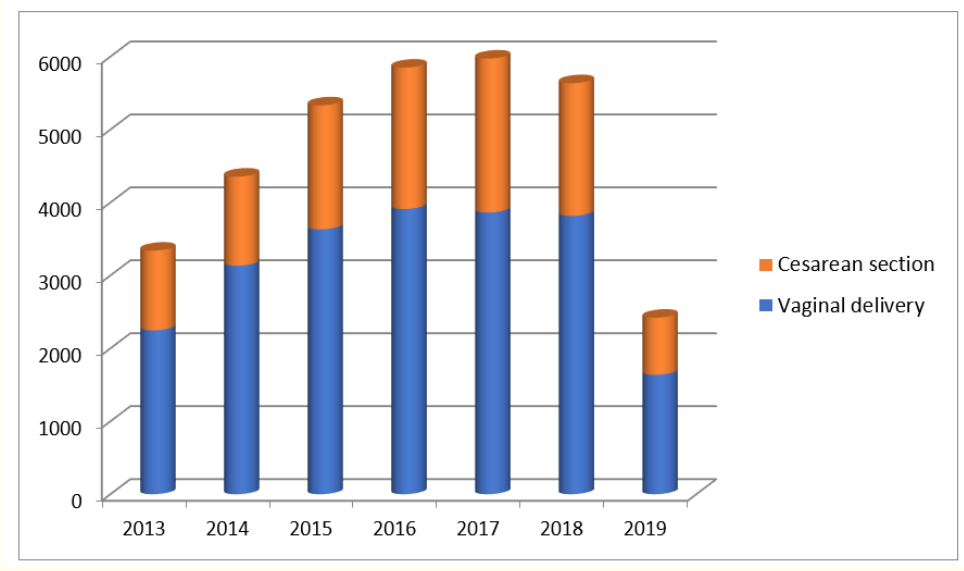

Figure 1: *Number of deliveries (vaginal-cesarean) in the years 2013 - 2019.*

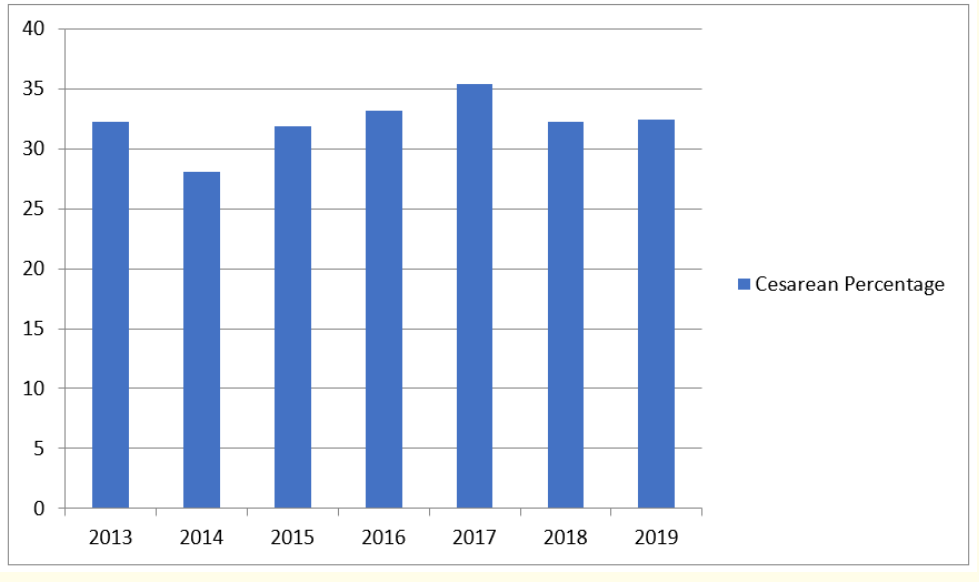

Figure 2: *Cesarean percentage in the years 2013 - 2019.*

Table 2 shows the indication for caesarean section by year. The most frequent in all years were related to repetitive cesarean section and fetal distress, respectively. Other indications included non-cephalic presentation, non-progression of labor, multiple pregnancy, pre-eclampsia, placental problems, caesarean section without scientific indication, and other causes.

Indications	Year						
	2013	2014	2015	2016	2017	2018	2019*
Repetitive cesarean	69.16	67.40	70.76	67.13	64.47	67.23	65.17
Fetal distress	10.24	10.72	10.17	9.95	9.99	9.73	10.33
Non-cephalic presentation	5.67	6.55	6.11	7.01	6.96	7.14	8.41
Failure of labor progress	5.76	4.25	5.0	7.63	7.95	6.59	6.76
Multiple pregnancy	4.30	5.24	4.05	3.71	4.21	4.28	4.71
Preeclampsia, HELLP syndrome	1.01	2.21	1.64	1.80	2.41	2.08	2.04
placental problems	1.09	1.71	1.23	1.34	2.17	1.42	1.02
Without scientific indication	1.82	0.49	0	0	0	0	0
Other reasons	0.95	1.43	1.04	1.43	1.84	1.53	1.56

Table 2: *Indication of cesarean section in percentages during the years 2013 - 2019.*

**: The first six months of the year.*

Discussion

The mean rate of cesarean section in a seven year period in Sina hospital in Ahvaz, Iran was 32.41% and the lowest rate was in 2014 (28.04%) and 2015 (31.88%), respectively. In both meta-analyzes in 2014 and 2018, the prevalence of cesarean section in Iran was estimated to be 48% [4,17]. Cesarean rates in Iran have been reported in studies ranging from 26 to 66.5%. This rate has been reported at up to 87% in some private centers [18,19]. According to the evidence, the lowest incidence of cesarean section in Iran is estimated in Bam city (16.2%) and highest in Tehran (66.5%) [17]. These prominent differences can be due to various factors, including cultural differences and socio-economic factors in different regions of the country. Another reason for the lower incidence of cesarean section in our study than in other studies in Iran is that Sina Hospital in Ahvaz is a maternal-friendly center that after implementing of health reform plan, cesarean section was not performed at the mother's request. Also, in our hospital pelvic stenosis or the discovery of meconium in the amniotic fluid is not included in the indications for cesarean section and in both cases; cesarean section is indicated only if there is no progression of labor or fetal distress. In addition, it seeks to make the childbirth pleasant and prevent unnecessary cesarean delivery using a combination of pharmacological and non-pharmacological methods to reduce labor pain [20,21].

Considering the rate of cesarean section in different years of study, it seems that due to the initiation of health reform plan in 2014, the lowest incidence of cesarean section is related to the years 2014 and 2015, i.e. the early years of the announcement of natural birth promotion package. Also, the mean rate of cesarean section in nulliparas in our study (19.36%) is lower than similar studies such as Khavandizadeh's study in Ardabil (54%) [22], which seems to be due to the above issues.

The results of the present study showed that repetitive cesarean section with the highest frequency and then fetal distress were the main indications of cesarean section, which is consistent with the findings of most studies in this area [18,23]. The overwhelming majority of women who have had cesarean section in their previous pregnancy, will have cesarean section again at their other pregnancies due to the risk of uterine rupture during vaginal delivery, and this defective cycle will increase the rate of cesarean section. This may be one of the reasons for the increasing rate of cesarean delivery in recent decades [24]. Therefore through proper planning and awareness during pregnancy, especially in primiparous women, as well as awareness and counseling on the possibility of vaginal birth after cesarean (VBAC) and its trial in eligible women, can prevent more cesarean sections due to previous cesarean and take a big step towards improving maternal and newborn health. The findings of the study by He., *et al*. showed that VBAC reduced postpartum hemorrhage and length of hospital stay compared to repetitive cesarean section, improved pregnancy outcomes and ultimately reduced cesarean delivery [25].

The census sampling method, the research setting with a wide range of clients, and sampling over a long seven-year period are the strengths of the study. Some cesarean sections may have been called legal indications due to legal and insurance consequences and can affect the actual outcome. It was extracted from the researcher's control and out of the study's limitations.

Conclusion

The rate of cesarean section in our study is higher than that recommended by the World Health Organization, but lower than the average cesarean section in Iran. Repetitive cesarean section was the most indication of cesarean section, reminiscent of the need for awareness, counseling, and trial of VBAC.

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