

Maternal and neonatal morbidity and mortality rate in caesarean section and vaginal delivery

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Abstract

Background: The cesarean section is one of the most common procedures to prevent health-threatening risks to the mother and infant. Increasing rate of cesarean section attracted the attention of professionals and the overall objective of this study was to determine the frequency of maternal and neonatal morbidity and mortality rates in the two methods of delivery.

Materials and Methods: In a comparative cohort study, 300 cases undergoing caesarean section and 300 cases with vaginal delivery were selected in two main hospitals of Isfahan, Iran during 2013 and 2014. Demographic characteristics and factors related to mortality and morbidity of mothers and infants were studied. Mothers were also recruited 6 weeks after delivery to ask for complications. Mothers and infants mortality and morbidity were studied and analyzed by SPSS 22 software.

Results: Follow-up of deliveries up to 1-month after delivery suggested 2 cases of infant death (7%) in vaginal delivery group, while no case of infant death was reported in cesarean delivery group ($P = 0.5$). Incidence of fever was observed in first 10 days after delivery in 7 cases in the vaginal delivery group and 11 cases in the cesarean delivery group (2.3% vs. 3.7%, $P = 0.4$).

Conclusion: Despite all the benefits of vaginal delivery compared with cesarean section, in many cases, especially in emergency cesarean section delivery can substantially reduce the maternal and neonatal mortality and morbidity. It is recommended to assess the complications of each method in all pregnant women about to give birth, and then decide on the method of delivery.

Key Words: Caesarean section, maternal and neonatal mortality, vaginal delivery

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INTRODUCTION

Considering available figures, caesarean delivery is increasing compared to vaginal delivery in most countries so that since 1970–2007, caesarean delivery in USA reached to 18% of all deliveries from 4.5%.^[1-5] In the study conducted during 1990–2005 in Canada, healthy women with singleton pregnancy who had no history of cesarean section and because BX profile

had undergone cesarean section (as a representative group of low-risk planned cesarean delivery) were compared to women who underwent vaginal delivery in terms of morbidity and mortality. Infectious contact with cesarean delivery was 0.6% and 0.2% and in vaginal delivery, wound dehiscence was 9% and 5% in vaginal delivery, wound hematoma was 1.2% in cesarean and it was 0.2% in vaginal delivery. Other morbidity including anesthesia, cardiac arrest, venous

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thromboembolism, and hysterectomy were higher in cesarean delivery, and only hypovolemic shock was higher in vaginal delivery.^[6]

According to the study in 1997, the cesarean rate was reported as 19.5% in Iran. Highest rate of it goes for Qom province and lowest rate of it goes for Sistan Baluchestan.^[7] According to the other research, anastomotic infection after cesarean section was selective for 4.7% and it was an emergency for 24.2%.^[8] In addition, according to the Elliot's report, Paccar 1 min after cesarean section under general anesthesia is lower than vaginal delivery.^[9] Mattox revealed that the incidence of neonatal tachypnea of the newborns born by cesarean section was 4.5 times higher compared with vaginal delivery.^[9]

However, despite all the benefits mentioned that natural childbirth, indications for cesarean delivery are not too low and neglect of natural childbirth complications may be leading to the increased maternal and fetal morbidity and mortality. Thus, the purpose of this study was to compare the incidence of maternal and neonatal morbidity and mortality rates of cesarean section and vaginal delivery at Al-Zahra and Shahid Beheshti Educational Health Centers of Isfahan.

MATERIALS AND METHODS

It is a comparative cohort study conducted in 2013 in Al-Zahra and Shahid Beheshti Educational Health Centers in Isfahan.

Inclusion criteria included single pregnancy, first pregnancy and patient's agreement to participate in the study. In case of mothers' reluctance to continue the study, they were excluded.

Sample size was specified using sample size estimation formula in order to compare two rates considering confidence level 95% and test power as 80%, the overall incidence of complications of cesarean delivery was considered as 0.5 due to the absence of a similar study and least significant difference between the two groups was equivalent to 0.1, thus, sample size was specified as 300 in each group.

The research was conducted as follows: Following approval of proposal and performing necessary coordination, 300 cases of cesarean delivery and 300 cases of vaginal delivery were selected and necessary information including demographic characteristics of mother and infant as well as factors related to mortality and morbidity of mother and infant were extracted from the hospital records.

Furthermore, in order to determine complications up to 42 days after delivery, the mother was called, complementary information were taken. Mothers and infant mortality and morbidity cases in mothers included fever, wound infection, urinary tract infection, need for blood transfusion and any complications related to childbirth in neonates.

Research data were analyzed after entry in SPSS version 22 software (made by IBM corporation, USA) using *t*-test, Chi-square, and Mann-Whitney test.

RESULTS

In this study, 300 vaginal delivery cases and 300 cesarean delivery cases were studied. Average weight at birth of infants in two groups of vaginal delivery and cesarean group was 2964 ± 529 and 2869 ± 630.7 g, respectively. According to *t*-test, infants from vaginal delivery had higher weight at birth ($P = 0.047$). Of 300 vaginal deliveries, 168 cases (56%) were emergency and 132 cases (44%) were elective. Reasons for emergency cesarean were recognized as fetal distress (134 cases) and narrow pelvis of the mother in labor (23 cases) and abruption (11 cases). Reasons for elective cesarean were abnormal fetal presentation (Breech) (53 cases), the tendency of mothers (57 cases) and cranio-pelvic disproportion (22 cases). In Figure 1, the frequency percentage of cesarean delivery in women is demonstrated.

Follow-up of deliveries up to 1-month after delivery suggested 2 cases of infant death (0.7%) in cesarean section group, while no case of infant death was reported in cesarean delivery group. However, according to Fisher's exact test, the frequency of deaths of infants under 1-month showed no significant difference ($P = 0.5$) in the two groups. However, infants I cesarean delivery group had higher Apgar scores at 1 and 5 min ($P < 0.001$) [Table 1].

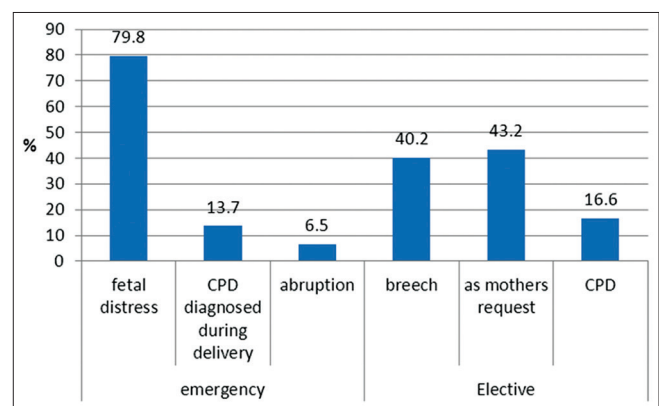


Figure 1: Frequency percentage of cesarean delivery for women under study

Table 2 gives frequency distribution of maternal complications in vaginal delivery and cesarean delivery in first 10 days after delivery. During delivery process, 14 ones from vaginal delivery group and 4 ones from cesarean delivery group needed blood injection (4.7% vs. 1.3%), and according to Chi-square test, the difference between two groups was significant ($P = 0.17$). Incidence of fever was observed in first 10 days after delivery in 7 ones in vaginal delivery group and 11 ones in cesarean delivery group (2.3% vs. 3.7%), and according to Fisher's exact test, the difference was not significant ($P = 0.4$). Urinary tract infection was observed in 12 ones in the vaginal delivery group and 10 ones in the caesarian delivery group. According to Chi-square test, the different between two groups was not significant ($P = 0.66$). Figure 2 indicates frequency distribution of complications in two groups under study.

Figure of hospitalization duration in vaginal delivery and cesarean delivery groups was 1.43 ± 0.69 and 1.83 ± 0.91 days and according to *t*-test, average of hospitalization period in cesarean group was significantly higher ($P = 0.001$). Figure 3 indicates frequency percentage of hospitalization period in two groups.

Investigation of patient satisfaction in two groups of vaginal delivery and cesarean delivery showed that 211 ones in vaginal delivery group and 243 ones in cesarean delivery group were satisfied with their way of delivery (70.3% vs. 81%). Furthermore, 20 and 23 ones were relatively satisfied respectively in two groups (6.7% vs. 7.7%). 6 ones (2%) in the cesarean group had no idea. 30 ones in vaginal delivery group and 10 ones in cesarean delivery group were relatively dissatisfied (10% vs. 3.3%) and 33 ones and 24 ones

respectively were completely dissatisfied (11% vs. 8%). According to Mann-Whitney test, the frequency distribution of satisfaction between the two groups was statistically significant ($P = 0.001$) [Figure 4].

DISCUSSION

The cesarean section is one of the most common procedures to prevent health-threatening risks to the mother and infant. Increasing rate of cesarean section

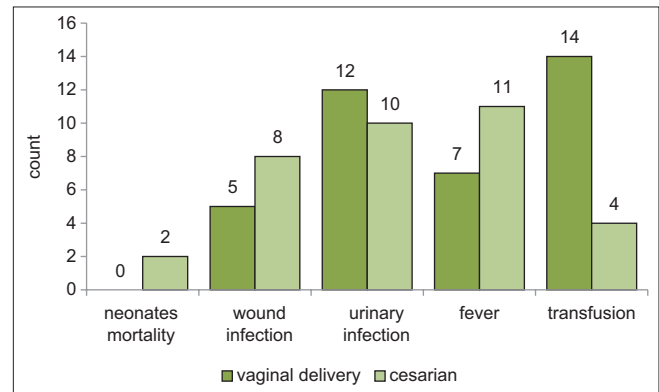


Figure 2: Frequency distribution of postdelivery complications in two groups

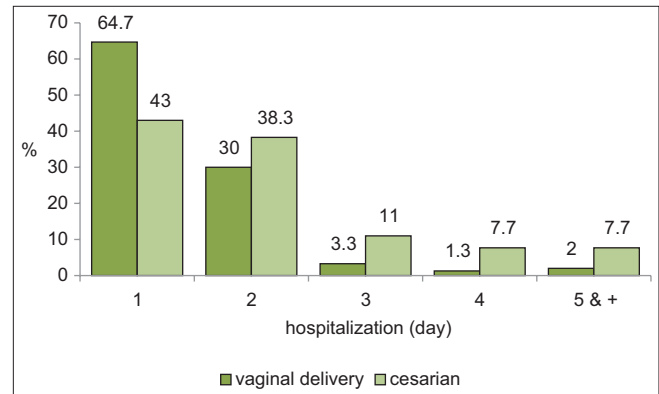


Figure 3: Frequency percentage of hospitalization time in the two groups

Table 1: Frequency distribution of characteristics of infants in two groups

Variable	Type of delivery		P
	Vaginal	Cesarean	
Mean birth weight	2964±529	2869±630.7	0.047
Death of infants under 1-month			
Yes	0 (0)	2 (0.7)	0.5
No	300 (100)	298 (99.3)	
Mean Apgar at 1 min	8.57±1.13	8.95±0.22	<0.001
Mean Apgar at 5 min	9.68±0.95	9.97±0.17	<0.001

Table 2: Frequency distribution of maternal complications during first 10 days after delivery in two groups

Variable	Type of delivery		P
	Vaginal	Cesarean	
Fever	7 (2.3)	11 (3.7)	0.34
Topical infection	5 (1.7)	8 (2.7)	0.4
Urinary infection	12 (4)	10 (3.3)	0.66

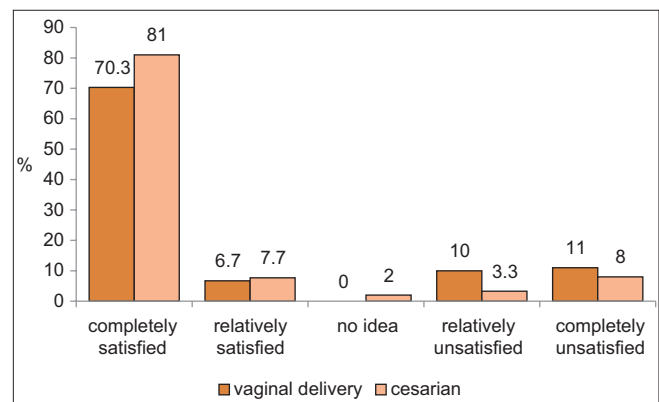


Figure 4: Frequency percentage of delivery type satisfaction in two groups

attracted the attention of professionals and the need for a cesarean section has become a main discussion in the medical community^[10] and the overall objective of this study was to determine the frequency of maternal and neonatal morbidity and mortality rates in the two methods of delivery.

Investigation of reasons for cesarean delivery showed 54% of cases were emergency and 46% were elective. Fetal distress was one reason for emergency cesarean delivery and BX was the main reason for elective cesarean delivery.^[3] In the study by Haghighi and Ibrahim, the most common reason for emergency cesarean delivery is regarded as fetal distress.^[11]

According to the obtained results, up to 1-month after delivery two infants died in cesarean delivery group, while no cases of infant death was observed in infants delivered by vaginal delivery. Liu *et al.* showed though emergency cesarean delivery increases the risk of maternal death up to 9 times compared to vaginal delivery, this risk is up to 3 times in elective cesarean delivery.^[4]

Investigation of delivery complications up to 42 days after delivery showed the incidence of fever in the vaginal delivery group was lower than the cesarean group but not significant. Furthermore, the incidence of local infection in cesarean and urinary tract infection in vaginal delivery was higher, but the difference is not significant.^[12] Spong *et al.* (2012) also reported the risk of uterine rupture and infection in those who already have a cesarean delivery is higher compared with those who already have a vaginal delivery.^[13] In a domestic study by Boskabadi *et al.* (2014) in Tehran University of Medical Sciences, the incidence of urinary tract infection in women with cesarean delivery was higher than women with vaginal delivery.^[14]

In our study, hospitalization duration in women with cesarean delivery was significantly higher. It was also found in other studies and it is a natural finding that women with cesarean delivery should experience longer hospitalization due to the probability of surgery and anesthesia complications. On the other hand, patients with cesarean delivery had higher satisfaction with delivery compared to the group with vaginal delivery. It may be due to improper implementation of vaginal delivery and it is necessary to conduct more studies in this regards. Despite all the benefits of

vaginal delivery compared with cesarean section, in many cases, especially in emergency cesarean section delivery can be substantial reduce the maternal and neonatal mortality and morbidity, It is recommended that all pregnant women about to give birth, the risk of these complications were examined and then decide on the method of delivery.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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