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ORIGINAL ARTICLE

Evaluation of Outcomes of Cesarean Section on Demand

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Abstract

Background: **Cesarean delivery (C-section) is a surgical procedure used to deliver a baby through open incisions in the abdomen and uterus.**

Aim: **To evaluate and assess the causes, outcomes, and cost of cesarean section (CS) on demand in Al-Azhar Assiut University Hospital and private delivery centers.**

Patients and methods: **This randomized retrospective controlled study was performed on 400 pregnant women who underwent elective CS. Among women included in the study, group 1 underwent elective CS in Al-Azhar Assiut University Hospital ($n = 200$) and group 2 underwent elective CS in private delivery centers ($n = 200$).**

Results: **There was no statistically significant difference between the included groups regarding demographic data. There was a highly statistically significant ($P < 0.001$) increased percentage of obstetrician pressure in group 2 (24 cases, 12%) when compared with group 1 (0 case, 0%). There was fear of pain of CS on demand in two groups, with no statistical significant differences between the two groups ($P > 0.05$). There was a statistically significant ($P > 0.039$) increased percentage of postpartum hemorrhage in group 2 (21 cases, 10.5%) when compared with group 1 (10 cases, 5%).**

Conclusion: **CS on demand was a primary choice for delivery worldwide. CS is related to demographic factors of pregnant women (age, parity, and willingness of delivery mode) and is affected by other people who are in close contact.**

Keywords: Cesarean section, Delivery, Egypt, Pregnant

1. Introduction

Cesarean delivery (C-section) is a surgical procedure used to deliver a baby through an open incisions between abdomen and uterus.[1] On-demand cesarean section (CS) can be defined as a primary CS performed at the mother's request to prevent a natural birth.[2] Reasons for requesting CS are to avoid bad experience, more control over events, better care, and maintaining pelvic floor integrity.[3]

Cesarean deliveries have gone up across the globe, especially those performed when not medically necessary. The rate has elevated to about 5% in 1970 to 20% in 1996 to 32% in 2017.[4]

Potential advantages of planned cesarean delivery were lowering the danger of birth injuries such as asphyxia, shoulder dystocia, fractures, pain during birth, and prevention of pelvic floor disorders.[4]

Among pregnant women who choose CS on demand, the mode of delivery cannot be decided before the gestational age of 39 weeks.

One of the leading causes of maternal mortality related to cesarean delivery is deep vein thrombosis which may be complicated by pulmonary embolism as a well-known state of hypercoagulability, increasing the risk of venous thromboembolism.[6]

Therefore, the purpose of this study was to evaluate and assess the causes, outcomes, and cost of CS on demand in Al-Azhar Assiut University Hospital and private delivery centers.

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2. Patients and methods

A prospective cross-sectional study was conducted from October 2020 till October 2021 at Al-Azhar Assiut University Hospital. In this study, 400 pregnant cases were enrolled, which were divide into two groups: group I included 200 cases from Al-Azhar Assiut University Hospital, whereas group II included 200 cases ($n = 200$) from private delivery centers. An ethical committee was consulted before study initiation, and each patient selected for this study signed an informed consent form.

Women coming for CS on demand for the first time without any medical or obstetric indications with full-term pregnancy (39 weeks or more), having a single cephalic fetus, in the maternal age group between 20 and 35 years were included. However, if there was any medical or obstetric indication for CS such as breech presentation, medical conditions such as hypertension and diabetes, past history of previous uterine scar owing to previous myomectomy, multiple pregnancy, prolonged rupture of membrane of more than 12 h, and women with morbid obesity with BMI of more than 35 were excluded.

All included patients received general or spinal anesthesia depending on their health. A total of 200 pregnant women underwent elective CS on demand in Al-Azhar University Hospital (group 1) (CS on demand) and 200 pregnant women underwent elective CS on demand in some private clinic centers (group 2), with the total number of CS cases being 400.

All patients were subjected to the following: acceptance to participate in the study; full history taking, including patient's name, age, demographic data, and special habits, as well as husband's name, age, occupation, and special habits; last menstrual period; and previous obstetric history such as vaginal tear or cervical tear. Their education, occupation, parity, and previous mode of delivery were also recorded. All patients included in the study underwent counseling about benefits and drawbacks of both CS and vaginal delivery.

2.1. Statistical analysis

Data were calculated and tabulated using Statistical Package for the Social Sciences, version 24 (SPSS, USA). Quantitative data were expressed as mean and SD, and qualitative data were expressed as frequency and percentage.

3. Results

This study was conducted from October 2020 and October 2021 to assess causes, outcomes, and cost of CS on demand at Al-Azhar Assuit University Hospital and private delivery centers. The study was performed on 200 cases who requested to deliver by CS in Al-Azhar Assiut University Hospital (group 1) and 200 cases who requested to be delivered by CS in private delivery centers (group 2). There was no statistically significant difference between the studied groups regarding demographic data. There was a highly statistically significant increased percentage of obstetrician pressure in group 2, bad history of previous experience in group 1, fatigue in group 1, fear among mothers in group 2, and longer hospital stay in group 2. There was no statistically

Table 1. Demographic data (age, residence, education, occupation, and BMI).

	Group I ($N = 200$)		Group II ($N = 200$)		Statistical test	P value
Age (years)						
Median	29	29	MW = 19 230		0.505 NS	
IQR	25–32		25–32			
Residence						
Rural	85	42.5%	69	34.5%	$\chi^2 = 2.7$	0.1 NS
Urban	115	57.5%	131	65.5%		
Education						
Illiterate	30	15%	30	15%		
Primary	40	20%	40	20%		
Secondary	50	25%	51	25.5%	$\chi^2 = 0.016$	0.999 NS
University	80	40%	79	39.5%		
Occupation						
Housewife	38	19%	40	20%		
Laborer	42	21%	44	22%	$\chi^2 = 2.7$	0.429 NS
Farmer	58	29%	44	22%		
Professional	62	31%	72	36%		
BMI (kg/m^2)						
Median	26		26		MW = 19 610	0.733 NS
IQR	24–27		24–27			

IQR, interquartile range.

Table 2. Demand of cesarean section.

	Group I ($N = 200$)		Group II ($N = 200$)		χ^2	P value
Causes of CS						
Fear of pain	50	25%	56	28%	0.46	0.496 NS
Fear on baby	20	10%	30	15%	2.28	0.130 NS
Bad history of previous experience	36	18%	6	3%	23.9	<0.001 HS
Obstetrician pressure	0	0%	24	12%	12.3	0.0004 HS
Family pressure	16	8%	18	9%	0.12	0.719 NS
Fear on mother	12	6%	24	12%	4.4	0.036 S
Fear on pelvic floor	30	15%	38	19%	1.13	0.286 NS
Fatigue	36	18%	4	2%	28.4	<0.001 HS

Table 3. Maternal outcomes of cesarean section.

	Group I ($N = 200$)		Group II ($N = 200$)		χ^2	P value
Maternal outcome						
No maternal complications	79	39.5%	92	46%	1.72	0.188
Anesthetic complications	2	1%	1	0.5%	0.33	0.562
Surgical complications	20	10%	16	8%	0.48	0.484 NS
Postpartum hemorrhage	10	5%	21	10.5%	4.2	0.039 S
Maternal wound infection	40	20%	30	15%	1.73	0.188 NS
Longer hospital stay	49	24.5%	40	20%	1.17	279 NS

Table 4. Fetal outcomes of cesarean section.

	Group I ($N = 200$)		Group II ($N = 200$)		χ^2	P value
Fetal outcome						
No fetal complications	108	54%	93	46.5%	2.25	0.133 NS
Fetal morbidity	40	20%	30	15%	1.73	0.188 NS
Fetal mortality	2	1%	1	0.5%	0.33	0.652 NS
Longer hospital stay	30	15%	60	30%	12.9	0.0003 HS
Iatrogenic prematurity	20	10%	16	8%	0.48	0.484 NS

Table 5. Gestational age of cesarean section.

	Group I ($N = 200$)		Group II ($N = 200$)		χ^2	P value
Gestational age						
39 weeks	60	30%	100	50%	16.6	<0.001 HS
Full term	90	45%	60	30%	9.6	0.002 S
Postterm	50	25%	40	20%	1.43	0.231 NS

Table 6. Distribution average cost of various components of cesarean section.

	Group I ($N = 200$)	Group II ($N = 200$)
Preanesthetic medication cost	50	100
Anesthetic fare	Free	300
Anesthetic medications	90	100
Surgical equipment	110	200
Postoperative medications	200	300
Prelap and postlap test	100	400
Surgeon fare	Free	2000
Hospital cost	Free	1000
Total cost	550	4400

significant difference between studied groups regarding causes of CS, maternal wound infection, and fetal outcome, but there was increased percentage of postpartum hemorrhage in group II (Tables 1–6).

4. Discussion

This study was conducted between October 2020 and October 2021. Throughout this period, 200 cases that requested to be delivered by CS in Al-Azhar Assiut University Hospital (group 1) and 200 cases that requested to be delivered by CS in private delivery centers (group 2) were enrolled.

This is in agreement with the study by Cesar et al.,[7] who stated that the prevalence of 10.7% of CS on demand was similar to that observed in other countries. The incidence varied from 6 to 8% in UK and north Europe, 11.2% in USA, and 17.2% in Austria.[8]

In addition, Al Rowaily et al.[9] mentioned that of 22 556 delivered pregnant women throughout the period between 2008 and 2011, CS deliveries represents 19.05 and 10.1% were on maternal request. Majority (73.25%) of the studied women were 26–35) years, whereas 26.25% of them were 20–25 years. This is similar to the study reported by Karlström et al.[10]

In this study, the number and percentage of CS on request increased with increased age (27.5, 34.5, and 38%, respectively, in group 1 and 26, 36.5, and 37.5%, respectively, in group 2) and in urban dwellers (57.5% in group 1 and 65.5% in group 2) than rural population (42.5% in group 1 and 34.5% in group 2), and with increased level of education (illiterate, primary, secondary, and university education represented 25, 18, 27, and 30%, respectively, in group 1 and 20, 21, 24, and 35%, respectively in group 2), with significant differences, and with advanced occupations (housewife, laborer, farmer, and professional represented 19, 21, 29, and 31%, respectively, in group 1 and 20, 22, 22, and 36%, respectively, in group 2), with significant differences.

The results agree with Samson Gebremedhin[11], who reported that the CS rate increased significantly with educational level, where women with secondary educational level (33%) were twice than illiterates (16.5%) and primary education (15.8%). However, the percentage represent higher in rich women (28.6%) compared with poor (16.4%) and middle (19.5%) classes.

Our results revealed that the educational level played a role in demand for CS. The majority of our enrolled cases (130 women) had high education level, which reveals that there was a relation between educational level and CS on demand.

In the study by Gholami and Salarilak,[12] of 148 women who preferred CS, the educational level was as follows: less than diploma (49) and more than or equal to diploma (99). As mentioned by studies of Hsu et al.[3] and Karlström et al.,[10] there were negative relations between educational level and CS on demand.

In our study, there was a greater preference for CS among primipara than multipara, as of 400 cases included in this study, 259 (64.75%) of them were primipara, whereas 141 (35.25%) were multipara.

Similar results were demonstrated through other studies, where greater preference for CS was seen in multiparas than nulliparas, as reported by Cesar et al.[7] [primipara 164 (12.4%) and multipara 232 (17.6%)], Hildingsson et al.[13] [primiparas 92 (7.2%) and multipara 154 (8.9%)], and Karlström et al.[10] [primiparas 31 (5.8%) and multiparas 59 (9.0%)].

In the current study, of 400 women, 259 (64.75%) were primapara. Similarly, in the study by Gholami and Salarilak,[12] 18.6% of first pregnancy cases preferred CS, in correspondent with the two studies by Pang et al.[14] and Fuglenes et al.[15]

The number and percentage of CS on demand increased in primipara more than multipara (64.75 vs. 35.25%), with significant differences. This incidence disagreed with the findings reported by other studies, where there was greater preference for CS among multiparas than nulliparas, as mentioned by Hildingsson et al.[13] and Samson Gebremedhin[11], who reported that the rate was significantly higher with the presence of previous CS.

Our results observed that the fear of pain was seen in 25 versus 28%, fear for the baby was seen in 10 versus 15%, fatigue was seen in 18 versus 2%, pelvic floor injuries were seen in 15 versus 19%, bad history was seen in 18 versus 3%, fear on mother was seen in 6 versus 12%, family and husband pressure was seen in 8 versus 9%, obstetrician pressure was seen in 0 versus 12%, in group 1 versus group 2, respectively, with more incidences in group 2 with significant differences, except in with fatigue and with bad history of previous experience, with more incidences in group 1, with significant differences.

These results agree with Fuglenes et al.,[15] who reported that pain (57.8%), child (39%), and family and husband pressure (36%) were the most common causes that push women to prefer CS over vaginal delivery.

Moreover, in a previous study, Torloni et al.[16] reported that the reasons for demand of CS were fear of pain (77%), family planning (74.5%), baby suffers less (64.1%), safer for mother (64%), and easier to get back to sexual activity (43.6%).

In our findings, distribution of maternal and neonatal outcomes number among both groups was as follows: the main maternal outcome was longer hospital stay (24.5% in group 1 vs. 20% in group 2), then febrile morbidity (infections) (20 vs. 15%), then postpartum hemorrhage (5 vs. 10.5%), surgical/traumatic-complications (10 vs. 8%), and anesthetic complications (1 vs. 0.5%). These complications were highly significant in the first group than the second group, except postpartum hemorrhage, which was higher in group 2 than in group 1.

However, in the study by Masciullo et al.,[17] no major complications of Cesarean Delivery on Maternal Request (CDMR) in contrast to CS indication were reported. Notably, a recent Danish study from 2019 by Otkjær et al.[18] showed no major complications of CDMR but high existence of wound infections.

The main neonatal outcomes were the fetal morbidity (20% in group 1 vs. 15% in group 2),

neonatal length of hospital stay (15 vs. 30%), iatrogenic prematurity (10 vs 8%), and fetal mortality (1 vs. 5%). There were higher rates in the first group than the second group, except for neonatal length of hospital stay, was higher in the second group than the first group, with significant differences.

These results were in agreement with Hansen et al.,[19] who determined an increase in respiratory morbidity among term babies born by planned CS.

The average costs of CS on demand among the included groups varied, based on the anesthetist fare, surgeon fare, and hospital cost, which were free in the university hospital. This agreed with Hobbs et al.,[20] who stated that CS costs were approximately double or triple the cost of vaginal delivery. They added that the cost of CS in public hospitals is around 150 EGP, whereas in the self-funding economic section of public hospitals, it ranges from 400 to 500 EGP. In private hospitals, it ranged between 2000 and 5000 EGP depending on physician seniority level. In contrast, they reported a vaginal delivery cost of 50 EGP at health centers, 200–300 EGP in a public hospital, and 1000–2000 EGP in a private hospital.

5. Conclusion

CS on demand is a primary choice for delivery worldwide. CS is related to the demographic factors of pregnant women (age, parity, and willingness of delivery mode) and is affected by people in close contact.

Conflict of interest

None declared.

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