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REPRODUCTIVE AND URINARY SYSTEM'S COMPLICATIONS AFTER CESAREAN SECTION VERSUS VAGINAL DELIVERY: A COMPARATIVE STUDY IN DUHOK CITY /IRAQ

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ABSTRACT

Background: The mode of delivery may have a significant effect on maternal outcomes after delivery. In this regard, we aimed to assess the reproductive and urinary system complaints of women who underwent C/S compared to vaginal delivery (V/D). Methods: In this comparative study, the women who received the C/S or V/D were invited to report their complications of the reproductive and urinary tract systems. Data were collected through the application of the direct interview technique with women. Purposive sampling was used for selecting the sample; in this study, we included 400 cases of C/S and V/D equally. Results: The study shows the large number of women' ages ranged between (20-29). In this comparative study between C/S and V/D found in reproductive systems in both groups more than half had vaginal discharge and less than quarter had abdominal pain in both groups, there was significant between C/S and V/D with vaginal discharge in reproductive system. Also, in urinary tract system in both groups less than quarter had Pain or a burning sensation during urination, Lower abdominal, flank and Back pain. Conclusion: This study showed that the women in the C/S were more likely to have reproduction and urinary adverse outcomes compared to the V/D group. The number of complications was associated with having low socio-demographic status.

KEYWORDS: Cesarean section, vaginal delivery, reproductive system complications, urinary system complications.

INTRODUCTION

Cesarean section is characterized by an abdominal and uterine incision that enables the removal of the infant, placenta, and extra embryonic membranes. When certain difficulties occur during pregnancy or labor, a cesarean section is a surgical surgery that may be able to save the lives of both mothers and their newborns (Zahra, *et al* 2015).

The contemporary cesarean birth was first introduced in the last century to lessen the problems, morbidity, and mortality experienced by mothers and babies. Regrettably, C/S are no longer only performed when absolutely required and in order to preserve the mother and the infant; rather, certain societies are slowly beginning to view them as luxury. The predicted rate of cesarean deliveries is virtually universally regarded as being as low as 13%, and according to World Health Organization (WHO), it is advised to be as low as 15%. These data also state that, the average rate of cesarean deliveries has climbed by 10– 15% in recent years worldwide. According to certain research, the likelihood that a woman will have a cesarean section now is three times higher than it was 20 years ago. Several countries have had varied increases in cesarean sections (C/S), with underdeveloped nations seeing substantially higher rates than industrialized nations. (Mohammad *et al*, 2018-Bagheri *et al*, 2012).

The dangers and hazards of a C/S are the same as those of any operation. They may last for years after the current birth and have an impact on the mother's, the child's, and future pregnancies' health. The chance of needing a blood transfusion, the risks of anesthetic problems, organ damage, infection, thromboembolic illness, and infant respiratory distress all rise after caesarean delivery (Mylonas, 2015).

Moreover, studies have shown that the financial costs associated with recurrent CS, such as the length of hospital stays, the medications used, and their consequences, are

much higher than those associated with normal vaginal delivery (NVD). Intensive care admission, hysterectomy, issues with subsequent fertility such as reduced fertility, ectopic pregnancy, miscarriage, and increased risks of fetal and neonatal mortality are additional complications of C/S. They also include the increased risk of placental adherence and uterine rupture in subsequent pregnancies, diseases and endometritis usually, the pain following a C/S is worse than the pain following a V/D (Mylonas and Friese, 2015).

C/S was associated with greater risk of postpartum infection, urinary infection, headache, pain and anesthetic complications; and, unlike expected, was not a protection factor against late complications, such as urinary and fecal incontinence, cystocele and uterus prolapse (Keila et al 2018).

The study aimed to determine the complications of reproductive and urinary system among women after C/S versus V/D and heir associations with socio-demographic characteristics.

PATIENTS AND METHODS

Study design and sampling techniques

In this comparative study, the women who received the C/S or V/D were invited to report their complications of reproductive and urinary tract systems. Data were collected through application of the direct interview technique with women. The women had right of withdrawing during the data collection at any time. Purposive sampling was use for selecting the sample. In this study, we selected 400 cases divided in two groups equally; C/S 200 cases and V/D 200 cases.

Setting and time of data collection

The target populations of this study were the women who attended the primary health centers (PHCs) and delivered baby six months ago in Duhok city to determine long term complications between the study groups. These women were those living in Duhok and had different educational levels and were at six months after C/S or V/D. Purposive sampling was used for selecting the sample in this study. We visited the PHCs every Sunday and Wednesday each from 8:00AM to 1:00PM. About 10-15 women were interviewed. Each women's interview took about 10-15 minutes. The name and number of PHCs were taken from General Health Directorate in Duhok city, consisted of fifteen centers. The researcher selected four centers through a simple random sampling technique. The name of PHCs we included in this study were Qazi Muhammad, Zaniest, Malta and Khabat PHC. The data collection was performed from fifth of Jan2022 to first May2022.

Inclusion and exclusion criteria

The women who spent 6 months of C/S and V/D and attended the PHCs in Duhok city were eligible for this study regardless of their age. The study excluded those women who refused to participate in this study and women who had chronic diseases.

Data collection and methods

The data of the study were recorded in a pre-designed questionnaire consisted of the following parts. The first one consisted of data related to women' demographic characteristics, such as age, residency, education level, occupation, socioeconomic status. Second part about obstetrical history, part three about last pregnancy, delivery, early postpartum information and complication about last pregnancy, visiting the antenatal care during the last pregnancy, **v**isiting private clinic during the last pregnancy, last child's gestational age, delivery and early postpartum period (24hrs) after delivery. Part four had questions about C/S, type of operation, type of anesthesia, part five about reproductive and urinary systems complications of both groups' C/S or V/D, consisted of data related to women complains about episiotomy.

STATISTICAL ANALYSES

The general information of the women in both study groups was presented in mean (SD) or number (%). The prevalence of breast-feeding problems and physical status of both V/D and C/S were determined in number and percentage. The comparisons of complications of urinary and reproductive systems between V/D and C/S were examined in Pearson chi-squared test. The significant level of difference was determined in a p-value of less than 0.05. The statistical calculations were performed in statistical software JMP Pro 14.3.0.

The protocol of the study was submitted to the Scientific and Ethical Committees in Duhok General Health Directorate for approval. Verbal consent was taken from the study participants before data collection and after explaining the objectives of the study.

RESULTS

The study did not find the statistically significant difference in age category, residency, occupation, religion, women education, spouse education, crowding index, possession of car, type of housing and cost of electrical machines in socio-demographics characteristics. The study showed the highest percentage of age among the study sample were ranged 20-29 in the study groups (47% vs.54.5%; p=0.3050). The highest percentage of women live in the urban (90% vs. 89.5%; p=0.8691). As well as more than three quarters of study groups of women occupations were unemployed (78% vs. 82%; p=0.3173). Regarding women's' religion the highest percentage were Muslims (97% vs. 96%; p=0.2622). The highest percentage in both groups of spouse education were at the level of primary (27.5% vs. 31%; p=0.2881), but mothers' level of education more than quarter in both groups at the level of intermediate and secondary. About half of the study samples were at moderate socioeconomic status in both groups (Table 1)

The study groups no significant difference in parity and child gender in obstetrical history (P=0.4417 and 0.3406). Both study groups had higher percentage of multi-para. The study did find the statistically significant difference in mode of previous delivery and place of previous delivery (P<0.001). The study showed that the patients in the C/S had highest percentage of previous C/S and V/D patients had highest percentage of delivery with episiotomy (97.5% vs. 65.5%), respectively. In other word, both study groups delivered in governmental hospitals. (table 2).

The study did not find the statistically significant difference in having complications between C/S and V/D (38.0% vs. 32.5%; P=0.2496). The common complication of both study groups were vaginal bleeding and infection like urinary tract infection (UTI). The study groups had no significant difference in the gestational age at visiting the ANC. The groups had no significant difference in the tetanus vaccination, visiting private clinic, fever during early postpartum, blood transfusion during early postpartum, and breast feeding during early postpartum. The patients in the C/S had significantly higher preterm birth (21.61%) compared to V/D group (4.0%; P<0.0001). However, the V/D women had higher prevalence of vaginal bleeding during early postpartum (10.0% vs. 3.5%; P<0.001; Table 3).

The study found that the women were more likely to have elective C/S than emergency one (61.5% vs. 38.5%), respectively. The spinal anesthesia was conducted in most of the patients in C/S group (67.5% vs. 32.5%) than general anesthesia (table 4).

The study found that the women in the V/D group had significantly higher prevalence of vaginal discharge compared to the women in the C/S group (73.0% vs. 62.5%; P=0.0247). The common complication of both study groups in reproductive system were vaginal discharge and lower abdominal pain, flank pain and back pain. The patients in the V/D had significantly higher white vaginal discharge colors (54% vs. 47%; p<0.0001) (table 5).

The study finds in both groups' C/S and V/D had pain in the surgical site incision in C/S and pain in episiotomy site or perennial pain (39.9% vs. 25.25%) (table 6).

The study showed that the women with low level of socio-demographic index were more likely to have multi-reproductive complications (30.0% vs. 11.34% and 4.82%; P0.0227), multiple urinary tract infection (57.89% vs. 28.93%, and 21.67%; P=0.0343). Also, the patients with grand-multipara were more likely to have multiple urinary tract infection complications (53.33% vs. 21.55%, and 33.33%; P=0.0153; Table 7).

DISCUSSION

According to the study's findings. Women in the C/S group experienced more complications than those in the V/D group. In both study groups. Previous research has looked into the medical issues that can arise after a C/S delivery, and the majority of those studies have found that C/S mothers are more likely to experience serious issues than V/D mothers, (Allen 2003), (Villar 2005), (Wen-Ying et al, 2014) and (Nuruzzaman et al, 2020).

This study shown that there were no appreciable differences in a number of sociodemographic and physiological traits between the women who received V/D and C/S. According of some previous studies women socio-demographics characteristics had negative affect on women's health after C/S and V/D, low level of education women have lack of information on their-self health and complication, longer women age affect to increase complication and women in low

monthly income get low quality of care after delivery (Nilsen et al.'s 2014), (Mohmmad N et al., 2019), (Haerawati and Rini 2022),

The study showed the women in V/D group higher significantly difference with vaginal bleeding among women. Nevertheless, the study done by (kaiela c et al 2004) Hemorrhage outcomes were not associated with the mode of delivery. Another Study done by (Daniela S, et al 2018) although heavy puerperal bleeding was a reported by 15.5% of the puerperal women, transfusion or hysterectomy was not needed in any case. Patients who had a C/S after labor showed a higher risk of short-term complications and sexual dysfunction than those who had vaginal delivery or elective C/S.

According to place of delivery in-group C/S delivered in private hospitals but in-group, V/D delivered in governmental hospitals, as study conducted by (Zelalem et al 2019) the prevalence of Caesarean section delivery in private hospital (65%) was higher than public hospitals (45%). The difference between private governmental hospital more likely go to private hospital who are economically good and can afford the payment. They might be choosing the Caesarean section to escape from labor pain. (Agustina M et al 2016) mention the Fear of pain and safety were the most frequent expressed reasons for preferring cesarean section. There was significant between C/S & V/D with mode of previous delivery and place of previous delivery in obstetrical history.

According to the study result find women in the C/S had more complications like infection of UTI and vaginal bleeding, the study supported result that women planning a C/S had a 36% higher risk of postpartum UTI than women planning a V/D. Using the actual mode of delivery as exposure, planned, emergency, and operative caesarean deliveries all carried a higher risk of UTI than spontaneous vaginal deliveries. In women who had previously undergone a C/S, having an intended C/S was not linked to an increased risk of postpartum UTI. The most frequent side effect of caesarean birth is postpartum infection, which has links to prolonged labor, membrane rupture, and diabetes, (Djernis et al, 2018) and (Dannecher et al, 2005).

the most common complications occur in the study groups C/S and V/D in reproductive systems vaginal discharge and abdominal pain. there was significant difference between C/S and V/D with vaginal discharge in reproductive system. The study not similar to our result done by (Kiela C et al 2004) showed the mode of delivery did not remain associated to any of the late complications studied.

In addition, in urinary tract system in the study groups common complication are Pain or a burning sensation during urination, Lower abdominal and flank and Back pain. Other study done by (Wesnes et al ,2008) showed the prevalence of urinary incontinence 6 months postpartum was in general lower for the CS group There was no statistically significant increased complication associated with C/S group compared to V/D group.

The study findings about nearly half of the study sample had surgical site pain in C/S group, but in V/D group more than half had vaginal delivery with episiotomy and had pain in site episiotomy. Study supported ours result done by (Daniela S, et al 2018) the most frequent maternal complication was pain, which had a similar frequency after vaginal delivery or cesarean section.

In addition, the women with high socioeconomic had a higher percentage of mono complications of the reproductive system of the study groups. There was significant association between the number of complications in urinary tract system with socioeconomic status and parity in V/D group, in addition other study (Kiela et al 2004) there was significant between late complications and parity. Another study (Dankwah et al 2019) mentioned there was significant relationship between C/S delivery and parity.

The women with low socioeconomic had a higher percentage of multi complications of the urinary tract system but the women with parity had a higher percentage of multi complications of the urinary tract system. Another study done by (Haerawati and Rini 2022) mentioned highly significant relationship between C/S delivery and socioeconomic status. Another study done by (Manyeh A et al 2018) the economic factor that predicted C/S delivery is the wealth index quintile; those in the richest index quintile were more likely double fold to experience C/S delivery compared with those in the poorest index quintile. The researcher thinks when compared with a district study is in line, where women in the richest wealth quintile were more likely to have CS delivery compared with those in the poorest quintile.

Conclusion: According to the study's findings, more women in the V/D group have

episiotomies together with V/D. The women with C/S had elective C/S about quarter of them without any medical condition. In both groups had pain in surgical site incision and episiotomy site. In-group C/S occur more complications and women with grand-multi parity have more complications. Economic status affects the women's complications. Women should be encouraged to have V/D instead of C/S to reduce complications.

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Table (1):- Comparisons of demographic characteristics between V/D and C/S.

Characteristics	Study groups no (%)		p-value
	Cesarean section (n=200)	Vaginal delivery (n=200)	
Age	29.87 (6.00)	28.82 (5.66)	0.0729
Age category			0.3050
19 and less	4 (2.00)	4 (2.00)	
20-29	94 (47.00)	109 (54.50)	
30-39	87 (43.50)	79 (39.50)	
40 and older	15 (7.50)	8 (4.00)	
Residency			0.8691
Rural	20 (10.00)	21 (10.50)	
Urban	180 (90.00)	179 (89.50)	
Occupation			0.3173
Employed	44 (22.00)	36 (18.00)	
Unemployed	156 (78.00)	164 (82.00)	
Religion			0.2622
Christian	2 (1.00)	6 (3.00)	
Muslim	194 (97.00)	192 (96.00)	
Yezidi	4 (2.00)	2 (1.00)	
Women Education			0.0895
Illiterate	25 (12.50)	19 (9.50)	
Read and Write	14 (7.00)	29 (14.50)	
Primary	50 (25.00)	52 (26.00)	
Intermediate and Secondary	52 (26.00)	55 (27.50)	
Diploma, University and High Education	59 (29.50)	45 (22.50)	
Spouse education			0.2881
Illiterate	27 (13.50)	27 (13.50)	
Read and Write	16 (8.00)	27 (13.50)	
Primary	55 (27.50)	62 (31.00)	
Intermediate and Secondary	52 (26.00)	42 (21.00)	
Diploma, University and High Education	50 (25.00)	42 (21.00)	
Crowding Index			0.8105
< 1.5	82 (41.00)	84 (42.00)	
1.5 - 2.9	105 (52.50)	106 (53.00)	
≥ 3	13 (6.50)	10 (5.00)	
Possession of Car			0.1867
No	76 (38.00)	89 (44.50)	
Yes	124 (62.00)	111 (55.50)	
Type of Housing			0.2884
Owned	94 (47.00)	84 (42.00)	
Partially Owned	48 (24.00)	62 (31.00)	
Rented	58 (29.00)	54 (27.00)	
Cost of Electrical Machines			0.9697
$ < 1500	42 (21.00)	44 (22.00)	
$ 1500 – 3000	134 (67.00)	132 (66.00)	
$ > 3000	24 (12.00)	24 (12.00)	

Table (2):- Comparisons of obstetrical history between two groups of the study sample.

Obstetrical history	Study groups no (%)		P-value (two-sided)
	Cesarean section	vaginal delivery	
Parity			0.4417
Grand multipara	23 (11.50)	30 (15.00)u	
Multipara	114 (57.00)	116 (58.00)	
Primipara	63 (31.50)	54 (27.00)	
Mode of previous Delivery			**<0.001**
C/S	195 (97.50)	7 (3.50)	
VD with episiotomy	1 (0.50)	131 (65.50)	
Vaginal delivery	4 (2.00)	62 (31.00)	
Place of delivery			**<0.001**
Home	0 (0.00)	3 (1.51)	
Hospital private	98 (49.00)	17 (8.54)	
hospital governmental	102 (51.00)	179 (89.95)	
Child Gender			0.3406
Female	98 (49.00)	107 (53.77)	
Male	102 (51.00)	92 (46.23)	

Table(3):- Comparisons of information of last pregnancy, delivery and early postpartum information.

Characteristics	Study groups no (%)		p-value (two-sided)
	Cesarean section	vaginal delivery	
Having complication			0.2496
No	124 (62.00)	135 (67.50)	
Yes	76 (38.00)	65 (32.50)	
Complications			0.1333
No complication	124 (62.00)	135 (67.50)	
Placenta previa	5 (2.50)	4 (2.00)	
Placenta abruption	1 (0.50)	3 (1.50)	
Oligohydramnios	14 (7.00)	10 (5.00)	
Polyhydramnios	12 (6.00)	7 (3.50)	
Vaginal bleeding	16 (8.00)	15 (7.50)	
Infection like UTI	21 (10.50)	26 (13.00)	
Breach presentation	7 (3.50)	0 (0.00)	
At which gestational age visited ANC			
1st trimester	3 (13.04)	1 (3.45)	0.3677
2nd trimester	11 (47.83)	13 (44.83)	
3rd trimester	9 (39.13)	15 (51.72)	
Tetanus Vaccine			
No	130 (65.00)	150 (75.00)	0.0291
Yes	70 (35.00)	50 (25.00)	
Visit private clinic			0.3635
No	14 (7.00)	19 (9.50)	
Yes	186 (93.00)	181 (90.50)	
Last Child's gestational age at delivery			
Post term (> 42 wks.)	8 (4.02)	2 (1.00)	**<0.0001**
Preterm (>24 and 42 wks.)	43 (21.61)	8 (4.00)	
Term (38 - 42 wks.)	148 (74.37)	190 (95.00)	
Vaginal bleeding during early postpartum			**0.0096**
No	193 (96.50)	180 (90.00)	
Yes	7 (3.50)	20 (10.00)	
Fever during early postpartum			0.5218
No	196 (98.00)	194 (97.00)	
Yes	4 (2.00)	6 (3.00)	
Blood transfusion during early postpartum			0.1882
No	195 (97.50)	190 (95.00)	
Yes	5 (2.50)	10 (5.00)	
Breast feeding during early postpartum			0.0562
No	39 (19.50)	25 (12.50)	
Yes	161 (80.50)	175 (87.50)	
Breast feeding time (after delivery)			**<0.0001**
Within 1hr.	1 (0.62)	33 (18.86)	
2hr. after	59 (36.65)	101 (57.71)	
3-4 hr. after	70 (43.48)	28 (16.00)	
5 hr. and more	31 (19.25)	13 (7.43)	

Table (4): -information regarding CS among women underwent C/S.

Items	Cesarean section no (%)
Type of operation	
Elective	123 (61.50)
Emergency	77 (38.50)
Elective C/S	
By need	103 (51.5.)
By request	20 (10.00)
emergency C/S	
Women conditions	25 (12.5.)
Fetus conditions	52 (26.00)
Type of anesthesia	
General anesthesia	65 (32.50)
Spinal anesthesia	135 (67.50)

Table (5):- Comparisons of two study groups regarding reproductive and urinary systems complications during 6 months of postpartum

Reproductive system	**Study groups no (%)**				**p-value (two-sided)**
	Cesarean section		**vaginal delivery**		
	No	**Yes**	**No**	**Yes**	
Abdominal pain	176 (88.00)	24 (12.00)	177 (88.50)	23 (11.50)	0.8766
Vaginal bleeding and blood losses	192 (96.00)	8 (4.00)	198 (99.00)	2 (1.00)	0.0547
Vaginal discharge	75 (37.50)	125 (62.50)	54 (27.00)	146 (73.00)	**0.0247**
Urinary tract system	**Study groups no (%)**				**p-value (two-sided)**
	Cesarean section		**vaginal delivery**		
Urinary incontinence	187 (46.75)	13 (3.25)	193 (48.25)	7 (1.75)	0.1687
Frequency of urination	167 (41.75)	33 (8.25)	166 (41.50)	34 (8.50)	0.8935
Pain or a burning sensation during urination	130 (32.50)	70 (17.50)	141 (35.25)	59 (14.75)	0.2393
Lower abdominal, flank and Back pain	135 (33.75)	65 (16.25)	132 (33.00)	68 (17.00)	0.7502
Pink, red or cloudy urine	195 (48.75)	5 (1.25)	195 (48.75)	5 (1.25)	1.000
Strong-smelling urine	193 (48.25)	7 (1.75)	198 (49.50)	2 (0.50)	0.0918
Nocturia	186 (46.50)	14 (3.50)	185 (46.25)	15 (3.75)	0.8471

Pearson Chi-squared tests was performed for statistical analyses.
The red bold number show the significant differences.

Table(6):- Surgical site incision in C/S and episiotomy in V/D.

	Study groups no (%)	
Incision in C/S	**Cesarean section**	
	No	**Yes**
Do you have pain in the surgical site	119 (60.10)	79 (39.90)
Have discharge of the surgical site	192 (96.97)	6 (3.03)
Have redness	181 (90.95)	18 (9.05)
Have Swelling	186 (93.47)	13 (6.53)
Episiotomy in vaginal delivery	**vaginal delivery**	
	No	**Yes**
Episiotomy	77 (38.50)	123 (61.50)
Pain of the site of episiotomy or perennial pain	148 (74.75)	50 (25.25)
Discomfort during sexual intercourse	153 (77.27)	45 (22.73)

Table(7):- Association between parity and SDI of the study sample with having complications in reproductive and urinary systems.

Human systems	**SDI (cesarean section) no (%)**			**p-value**
	Low socioeconomic	**Medium socioeconomic**	**High socioeconomic**	
Reproductive system				**0.0227**
No complication	5 (25.00)	30 (30.93)	31 (37.35)	
Mono complication	9 (45.00)	56 (57.73)	48 (57.83)	
Multiple complication	6 (30.00)	11 (11.34)	4 (4.82)	
Human systems	**Parity (vaginal delivery)**			**p-value**
	Primipara	**Multipara**	**Grand multipara**	
Urinary tract system				**0.0153**
No complication	32 (59.26)	82 (70.69)	12 (40.00)	
Mono complication	4 (7.41)	9 (7.76)	2 (6.67)	
Multiple complication	18 (33.33)	25 (21.55)	16 (53.33)	
Human system	**SDI category (vaginal delivery)**			**p-value**
	Low socioeconomic	**Medium socioeconomic**	**High socioeconomic**	
Urinary tract system				**0.0343**
No complication	8 (42.11)	75 (61.98)	43 (71.67)	
Mono complication	0 (0.00)	11 (9.09)	4 (6.67)	
Multiple complication	11 (57.89)	35 (28.93)	13 (21.67)	

Pearson chi-squared test was performed for statistical analyses.
Red bold numbers show the significant differences.
The significant associations were included in this table only.