Indications and determinants of caesarean section in Al Batool teaching hospital

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Abstract

Background: C-section (caesarean section) is a lifesaving procedure when certain complications arise during pregnancy and labor. however, it's a major surgery and associated with immediate maternal and perinatal risks and may have implications for future pregnancies as well as long term effects.

Objective: To describe indications and determinants of caesarean section in Al Batool teaching hospital in Diyala during the study period.

Patients and Methods: Across sectional study conducted among women admitted to Al Batool teaching hospital and delivered by C-section from first of October 2022 to 15th of march 2023.

Results: A total of 150 women underwent C-section enrolled in this study during the study period, age of participants ranged from 19-35. out of them, 88(59%) sections were elective and 62(41%) sections were emergent. commonest indication for emergency C-section was fetal distress (62%) and commonest indication for elective C-section was previous cesarean (33%).

Conclusion: Parity, residence, education, and antenatal care visits were significant determinants for C-section. previous C-section, maternal request and malpresentation were commonest indications for such procedure.

Keywords: C-section, Al Batool teaching hospital, malpresentation.

Introduction

The proportion of c- section to the total births is considered as one of the important indicators of emergency obstetric care [1]. Currently, the WHO states that C-section has paramount importance on reducing maternal and perinatal mortality and morbidity, provided that there is justified medical indication. However, in the absence of clear medical justification, C-section has no medical benefit, rather its associated with short and long term health risks as compared with vaginal delivery [2]. Since the nineteenth century, C-section has been used as an intervention to save the lives of women and their newborns from serious and life threatening childbirth related complications [3] despite popularity across the world, this procedure has its own risks and complications and therefore its indication has to be strictly monitored and regulated. The rate of population based C-section had been recommended by the WHO to lie between 5%to 15% [4]. In the past few decades the number of s-section has risen dramatically and globally, data from developed and developing countries showed an average rate

of 27% [5,6] with the national average reaching to 58% in some countries [7]. Non-medical indications of C-section has risen to almost one third on a total of 18.5milion s-c performed globally, leading to increased total cost and number of surgical intervention in women giving childbirth [4].

In Iraq the C-section rate in 2016 was (33.1%) (8) which was higher than reported in 2012(24.4%) [9]. In Ninawa governorate the rate of C-section was (15.2%) in 2012 [9] and remained increasing to reach (18.7%) in 2018 but during 2019 the rate slightly decreased to reach (17.2%) [11,12]. In Mosul city hospitals the C-section rate during 2018 was (22%) and increased to reach (25.7%) during 2019 [13,14]. The C-section rates during 2018 in the different governorates of Iraq revealed variations in the rate and ranging from, (14.2%) in the governorate of Al Anbar to (52.9%) in the governorate of Irbil [11].

The present study aimed to explore the indications of C-section along with their sociodemographic and obstetric determinants to identify factors needed to be addressed for strategies for ending maternal and neonatal surgery related mortality.

Patients and Methods

This was a hospital based cross sectional study conducted in governmental Al Batool teaching hospital in province of Diyala from October 1 2022 to   March 15   2023. Clearance was obtained from ethical committee of Diyala medical college, Diyala health directorate and from Al Batool teaching hospital. All pregnant women admitted to hospital and underwent C-section during the study period were included in this study after giving their consent, women who

delivered by normal vaginal delivery and women who didn't give their consent to participate were excluded. A total of 150 women delivered by C-section during the study period were interviewed directly by the researcher and information regarding their sociodemographic(age ,socioeconomic status, ,residence , education and employment), body mass index, obstetric characteristics (parity, gestation age at birth , fetal number of antenatal care visits , history of fetal loss)and indication and type of cesarean section as it was documented in inpatient file and case sheet were all inquired about .socioeconomic status were divided into four quartiles ,first quartile represented lower socioeconomic class, second and third quartiles represented lower middle and upper middle socioeconomic class respectively and 4th quartile represented upper socioeconomic class (18). Elective C-sections were defined as those performed without emergencies and decision was made before the onset of labor. Emergency sections were defined as those performed for maternal and fetal emergencies.

Statistical Analysis

Data were analyzed using SPSS version 22 software. Descriptive summary using frequencies, percentages, graphs and cross tabs were used to present the study result. the statistical significance was considered whenever P value is less than 0.05. The association between independent and dependent variables was determined using the chi square test and logistic regression .factors which were statistically significant in univariate analysis were subjected to multivariate logistic regression after eliminating confounding variables.

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Results

A total of 150 women with C-section were enrolled in this study. Out of them ,88(59%) were elective cesareans and 62(41%) were emergency C-sections.

Table (1) shows the sociodemographic and obstetric characteristics of the study participants. The maternal age for women underwent C-section ranged from 19-35 years. age distribution showed that majority of women were in the age group of 20-29. 67(77%) in elective and 48(79%) in emergency surgery group.8(9%) and 6(9%) of women were in the age group of 30-34 years in the elective and emergency surgery group respectively. Similarly, 9% of women were in the age group of 19 years in both groups. the proportion of women in the two groups didn't differ significantly (p= 0.905) the proportion of primigravida women was higher in the emergency surgery group, whereas proportion of multigravida women was significantly higher in the elective group (p= 0.0001). The proportion of upper and upper middle socioeconomic class women were maximum in elective whereas lower middle socioeconomic class women were in

emergency caesareans (p= 0.0009). The distribution of proportion of BMI of women was significantly higher in elective than in the emergency C-section (p=0.002). majority of women (66, 75%) belong to urban area in elective, whereas 42(68%) were of rural area in the emergency C-section group (p=0.001). The proportion of level of literacy was significantly associated in both groups (p=0. 0001). maximum proportion of employment (58,66%) was found in elective whereas 38(61%) were unemployed in emergency C-section group(p=0.001). For gestation age at birth, majority of women (48,55%) were term (gestation age is equal to or more than 37 weeks) in elective and 36(58%) women were preterm (gestation age is less than 37 weeks), which showed a non-significant association (p=0.066). Majority of women (83,94%) in elective and 50(81%) in emergency sections had singleton pregnancy (p=0.066). Majority of women (40,45%) were booked in elective and 27(44%) were unbooked in emergency sections, and they were significantly associated(p=0.0001). History of fetal loss was insignificantly associated in elective sections(p=0.463), Table (1).

Table (1): Distribution of sociodemographics and obstetrics characteristics among the study participants (n=150)

Characteristics	Elective CS, *n* (%)	Emergency CS, *n* (%)	*P*[*]
Age (years)			
16-19	8(9)	6(9)	0.905
20-24	45(51)	30(48)	
25-29	22(26)	18(31)	
30-34	8(9)	6(9)	
>35	2(5)	2(3)	
Parity			
Primipara	36(40)	48(77)	0.0001*

Multipara	52(60)	14(23)	
Socioeconomic status[@]			
Upper	29(33)	11(18)	0.0009*
Upper middle	31(35)	12(19)	
Lower middle	18(20)	29(47)	
Lower	10(12)	10(16)	
BMI			
<18.5	19(32)	14(23)	0.0002*
18.5-24.9	31(35)	26(42)	
25-29.9	18(20)	19(31)	
30-34.9	12(14)	2(3)	
>35	8(9)	1(1)	
Residence			
Rural	22(25)	42(68)	0.0001*
Urban	66(75)	20(32)	
Education			
Illiterate	9(10)	28(46)	0.0001*
Primary	8(9)	12(19)	
Secondary	40(45)	12(19)	
Higher secondary	31(36)	10(16)	
Employment status			
Employed	30(34)	38(61)	0.0001*
Unemployed	58(66)	24(39)	
Gestation age at birth			
Preterm (<37 weeks)	40(45)	36(58)	0.066
Term(>37 weeks)	48 (55)	26(42)	
Fetal number			
Singleton	83(49)	50(81)	0.005*
Multiple	5(6)	12 (19)	
Number of ANC visits			
0	7(8)	27 (44)	0.0001*
1	9(10)	10(16)	
2	32 (37)	14(23)	
>3	40(45)	11 (17)	
History of fetal loss			
Yes	34(39)	22(34)	0.463

| No | 54(61) | 40 (66) | |
| Total | 88 | 62 | |

* P (P-Value) = less than 0.05 is significant

CS=caesarian section

BMI= body mass index

Table (2) shows the various indications for caesarian sections. the most frequent indications for elective sections were previous caesarians ,29(33%).other indications were fetal distress,17(19%). malpresentation ,11(13%) and maternal request,8(9%). the main indications for emergency caesarians were fetal distress 39(62%) and others were previous caesarians ,12(19%).

Table (2): Various indications of cesarean section among the study participants (n=150)

Indication of CS	**Elective, *n* (%)**	**Emergency, *n* (%)**
Previous cesarean section	29(33)	12(19)
Maternal request	8(9)	1(2)
Fetal distress	17(19)	39(62)
Malpresentation	11(13)	1(2)
Failed induction	6(7)	2(3)
Bad obstetric history	7(8)	2(3)
Macrosomia	3(3)	2(3)
Abnormal umbilical cord Doppler study	5(6)	2(3)
Multiple pregnancy	2(2)	1(2)
Total	88	62

Table (3) shows the variables responsible for elective C-sections after adjusting for confounding variables. those women who presented with previous history of caesarians had greater chance for elective sections and it was statistically significant, (p=0.0001). Maternal request was also significantly associated with elective C-sections (p=0.022).those women who had presented with fetal distress had 1.5 times more chances of elective sections but this was statistically insignificant (p=0.474).women with failed induction had 3.2 times more chances of elective sections but this was statistically insignificant (p=0.251).the other indication like malpresentation ,bad obstetric history ,macrosomia and abnormal umbilical cord Doppler study had protective effect on type of caesarian sections as their adjusted odds ratio less than 1, thus women with these indications had more chances of elective sections but none was statistically significant.

Table (3): Binomial logistic regression analysis of indication and type of cesarean section

Indication	*B*	SE	*P* Value	Adjusted OR	95% Cl	
					Lower	Upper
Previous CS	-2.275	0.615	0.0001*	0.103	0.031	0.343
Maternal request	-2.754	1.201	0.022*	0.064	0.006	0.670
Fetal distress	0.432	0.604	0.474	1.541	0.472	5.033
Malpresentation	-2.988	1.187	0.012*	0.050	0.005	0.516
Failed induction	1.179	1.027	0.251	3.250	0.434	24.345
Bad obstetric history	-1.644	0.987	0.096	0.193	0.028	1.338
Macrosomia	-1.080	1.073	0.314	0.340	0.041	2.780
Abnormal umbilical cord Doppler study	-1.591	1.009	0.115	0.204	0.028	1.471
Multiple pregnancy	-1.368	1.348	0.310	0.255	0.018	3.577

Discussion

The aim of this study was to find out the most frequent indications for C-section and discovering important associated factors.in our study majority of women were in the age group of 20-24(51%) in elective and 30% in emergency group whereas in Varma et al study majority of women were in the age group of 26-30 years ,(51%) in elective and 2125 years (49%) in the emergency group [15].Primigravida constituted 73.8% in the elective group and 37.5% in the emergency group .Quin et al found in their study that primigravida are at higher risk and therefore a higher incidence of sections is found among them [16].In our study ,primigravida constituted 77% of the emergency group, whereas multigravida 60% where in the elective group this finding was consistent with other studies [17,18].

In our study upper and upper middle socioeconomic class women were common in elective group whereas lower middle class was common in emergency group (47%). In many other studies socioeconomic class was found to be positively associated with C-section deliveries [19].

The opposite trend has also been observed in developed countries where higher economic status was protective against C-sections [20]. In our study 68% of women belonged to a rural background in the emergency group, whereas 75% of women were from urban area in the elective group and the main reason was probably due to better facilities and patient care available to the urban population [21]. In our study majority of women (81%) were educated at secondary or higher secondary levels in the elective group, whereas majority of women

(46%) were illiterate in the emergency group, they observed that higher education, awareness and knowledge of child birth are expected to be high among this group of women [20]. In our study majority of women (66%) were employed in the elective group, whereas 61% were unemployed in the emergency group and the reason for this was probably to the earning and equality status.

Most of the women had 94% and 81% caesarians in singleton pregnancy in the elective and emergency groups respectively, whereas 6% and 19% caesarians were for multiple pregnancies in elective and emergency groups respectively. reason for the difference of caesarians in the multiple pregnancies was that most of the women came directly in labor in emergency. Hofmyer et al studied that most women had planned sections with twin pregnancy [21].

Majority of women (45%) had more than three antenatal care visits in the elective group, whereas in the emergency group, majority of women had one or no visit. The WHO recommended that antenatal care visits are crucial and responsible to identify complication in advance [22]. In our study, the most common indication of caesarian section in the elective group was previous caesarians (33%), followed by fetal distress (19%), malpresentation (13%), and failed induction (7%). Similar findings have been reported by other researchers [23,24]. The most common indication in the emergency group was fetal distress (62%) and previous sections in (19%) in the present study. fetal distress has a reported global prevalence of about 20% [25]. Malpresentation was the indication in 13% of elective and 25% in the emergency group. Ali et al reported in their study that 11.9% of malpresentations was an indication in emergency sections [26]. 9% of sections were done on patient request in the elective group and 2% in the emergency group, this situation is different in the developed countries where C-section on maternal request was a primary mode of delivery [27].

Conclusions

This study showed that underweight, illiteracy, primiparity, rural residence, lower middle socioeconomic status and having no ANC visits were determinants that significantly associated with highest proportion of emergency sections. this study also showed that previous C-sections, maternal request and malpresentation were commonest indications for elective surgery while fetal distress was commonest indication for emergency sections.

Recommendations

As most of C-sections are currently based on physician judgments, it may be extremely useful to develop and strictly implement national guidelines for performing C-sections.

Patient education on importance of regular antenatal care visits should be stressed on.

Ethical clearance: This study was conducted according to the approval of College of Medicine/ University of Diyala and in accordance with the ethical guidelines of the Declaration of ethical committee of the College (document no. 2023MKS788).

Conflict of interest: Nil

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مؤشرات ومحددات الولادة القيصرية في مستشفى البتول التعليمي

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الملخص

خلفية الدراسة: تعتبر العملية القيصرية (العملية القيصرية) إجراءً منقذًا للحياة عند ظهور مضاعفات معينة أثناء الحمل والولادة. ومع ذلك، فهي عملية جراحية كبرى وترتبط بمخاطر فورية للأمهات وفي الفترة المحيطة بالولادة وقد يكون لها آثار على حالات الحمل المستقبلية بالإضافة إلى آثار طويلة المدى.

اهداف الدراسة: لوصف مؤشرات ومحددات الولادة القيصرية في مستشفى البتول التعليمي في ديالى خلال فترة الدراسة.

المرضى والطرائق: دراسة مقطعية أجريت بين النساء المقبولات في مستشفى البتول التعليمي والذين تم ولادتهم بعملية قيصرية في الفترة من الأول من أكتوبر ٢٠٢٢ إلى ١٥ مارس ٢٠٢٣.

النتائج: خضع ما مجموعه ١٥٠ امرأة لعملية قيصرية مسجلة في هذه الدراسة خلال فترة الدراسة، وتراوحت أعمار المشاركات بين ١٩-٣٥. من بينها، كان ٨٨ (٥٩٪) قسمًا اختياريًا و٦٢ (٤١٪) قسمًا ناشئًا. كان المؤشر الأكثر شيوعًا للعملية القيصرية الطارئة هو ضائقة الجنين (٦٢٪) وكان المؤشر الأكثر شيوعًا للعملية القيصرية الاختيارية هو الولادة القيصرية السابقة (٣٣٪).

الاستنتاجات: كانت زيارات التكافؤ والإقامة والتعليم والرعاية السابقة للولادة محددات مهمة للقسم C. كانت العمليات القيصرية السابقة وطلب الأم وسوء المجيء من أكثر المؤشرات شيوعًا لمثل هذا الإجراء.

الكلمات المفتاحية: الولادة القيصرية، مستشفى البتول التعليمي، سوء العرض

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