

Indications and Rate of Cesarean Section in Al-Yarmouk Teaching Hospital 2022

Reyam Khalaf Hussein, Nadia Aziz Nasir¹

Department of Public Health, Al-Anbar Health Directorate, Iraqi Ministry of Health, ¹Department of Community and Family Medicine, College of Medicine, University of Baghdad, Baghdad, Iraq

Abstract

Background: Cesarean section (CS) is a life-saving surgical procedure when certain complications arise during pregnancy and labor. Analysis of CS rates is useful for health institution to assess overall progress in maternal and fetal health and to plan emergency obstetric care and resource utilization. **Objectives:** The objective is to study the rate of CSs in Al-Yarmouk Teaching Hospital in Baghdad and to study the indications of CSs during the study. **Patients and Methods:** A cross sectional study was conducted among 250 women admitted to Al-Yarmouk Teaching Hospital and delivered by CS for various reasons, from March 1 to last of June 2022. Data were collected by interviewing with participation. **Results:** The rate of CS during the data collection period was 53.6%. Of these procedures 63.6% were elective. The main indications for elective CS were: previous CS 75.5%. Among the emergency CS, fetal distress was responsible for 28.6% of these operations. **Conclusion:** The rate of CS reported in this study was very high. The rate of planned CS is higher than that of emergency CS. Scarred uterus is the most common reasons for planned CS.

Keywords: Al-yarmouk teaching hospital, CS, indication, rate

INTRODUCTION

Cesarean section (CS) is a fetal delivery through an open abdominal incision (laparotomy) and an incision in the uterus (hysterotomy). The first modern CS was performed by German gynecologist Ferdinand Adolf Kehler in 1881.^[1]

Many factors have been identified to be associated with CS across the world such as premature rupture of the amniotic membrane, cephalo-pelvic disproportion, fetal distress, multiple pregnancy, breech presentation, and place of birth (private or public hospital), maternal preference, birth weight, parity, maternal height and antenatal care (ANC) use.^[2]

The World Health Organization (WHO) in 1985 considers the optimum rate of cesarean section rate (CSR) between (5%–15%).^[3] The prevalence of CSs is increasing globally each year where the rates have increased beyond the recommended level of 15%. CS rates beyond this level do not further reduce maternal and perinatal mortality.^[4] There is considerable variation in the rates of CSs, particularly between high- and low-income countries and between different institutions within these countries.^[5] For the last 30 years, there has been a public health concern about

increasing CS rates. In addition to the demographic and clinical characteristics of population such as maternal age, ethnic origin, previous scar, breech presentation, prematurity, and induction of labor all can greatly influence the rate of CS.^[6]

Currently, there is no standard classification system for CS that would allow the comparison of CS rates across different facilities, cities, countries, or regions in a useful and action oriented manner. As such, it is not yet possible to exchange information in a meaningful, targeted, and transparent manner to efficiently monitor maternal and perinatal outcomes.^[7]

In 2011, the WHO conducted a systematic review of systems used to classify CS, and concluded that the Robson classification is the most appropriate system to fulfill current

Address for correspondence: Dr. Reyam Khalaf Hussein, Al-Anbar Health Directorate, Iraqi Ministry of Health, Baghdad, Iraq. E-mail: reyamkhussein@gmail.com

Submitted: 20-Oct-2024 **Revised:** 25-Oct-2024

Accepted: 06-Nov-2024 **Published:** 31-Mar-2025

Access this article online

Quick Response Code:



Website:
<https://journals.lww.com/ircm>

DOI:
10.4103/IRJCM.IRJCM_42_24

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How to cite this article: Hussein RK, Nasir NA. Indications and rate of cesarean section in Al-Yarmouk Teaching Hospital 2022. IRAQI J COMMUNITY MED 2025;38:117-22.

international and local needs. The WHO recommended building on this to develop an internationally applicable CS classification system.^[8]

The system classifies all women into one of 10 categories as a set, totally comprehensive. The categories are based on five basic obstetric characteristics that are routinely collected in all maternities:

- 1 Parity (nulliparous, multiparous with and without previous CS)
- 2 Onset of labor (spontaneous, induced or prelabor CS)
- 3 Gestational age (preterm or term)
- 4 Fetal presentation (cephalic, breech, or transverse)
- 5 Number of fetuses (single or multiple).^[9]

In 2014, the WHO conducted a systematic review of the ecologic studies available in the scientific literature, with the objective of identifying, critically appraising, and synthesizing the findings of these studies, which analyze the association between CS rates and maternal, perinatal and infant outcomes.^[10] At the same time, the WHO undertook a worldwide ecologic study to assess the association between CS and maternal and neonatal mortality, using the most recent data available.^[11]

In Iraq, the rate of CS was 38.6% according to Ministry of health report in 2019.^[12] Monitoring both CS rates and outcomes is essential to ensure that policies, practices and actions for the optimization of the utilization of CS lead to improved maternal and infant outcomes, and analysis of CS rates and outcome are useful for governments and policy-makers to assess overall progress in maternal and rate infant health and to plan emergency obstetric care and resource utilization.^[13]

Although CS is a safe operation, but when it is performed without medical need it puts mothers and their babies at risk of short- and long-term health problems. Most complications of CS, however, come from the cause which leads to CS. Factors that make some women more likely to have complications include: Obesity, large infant size, prolonged labor, multiple pregnancies, and premature labor. In the absence of a clear medical indication, the excess risk associated with the operation itself must be considered. Short- and long-term maternal and infant problems associated with elective CS are higher than those associated with vaginal birth.^[14]

Major maternal complications were defined as presence of at least one of the following outcomes: hysterectomy, thromboembolic disease including cases with deep vein thrombosis or pulmonary embolism, cardiac arrest, and maternal death. Minor maternal complications were defined as the presence of one or more of the following outcomes: postpartum fever, wound infection, wound rupture and reoperation, spinal headache, bladder lesions, and acute colonic pseudo-obstruction (Ogilvie syndrome).^[15]

Aim of study

- To study the Rate of CS in Al-Yarmouk Teaching Hospital/Baghdad
- To study the indications of CS

- To identify the relation of Hypertension and diabetes mellitus with type of CS.

PATIENTS AND METHODS

Across sectional study with an analytic element was conducted on the patients admitted to the Obstetrics and Gynecology department in Al-Yarmouk Teaching Hospital in Baghdad from March 1, 2022, to the June 30, 2022.

In this study, a convenient sample of 250 mothers who were admitted to Al-Yarmouk Teaching Hospital's gynecological ward post C-section was interviewed. Data collection took place approximately 3 days per week, during which the purpose of the study was explained to the women and verbal consent was obtained from those who chose to participate.

Approvals of the scientific committee in the Department of Family Medicine in Baghdad College of Medicine and formal agreement were obtained from AL-Karkh health directorate and AL-Yarmouk Teaching Hospital. Verbal consent was taken from each participant.

Descriptive statistics presented as frequency tables, continuous variables were expressed as mean \pm standard deviation (SD) and categorical variables as numbers and percentages. Analytic statistics as Chi-square test and Fisher's exact test to find association between two categorical variables. The $P \leq 0.05$ was considered to be statistically significant.

Ethics approval

This study was approved by the ethical committee of Department of Family and Community Medicine, Medical College, Baghdad University, Baghdad, Iraq, on 31th march 2023.

To ensure adherence to ethical guidelines, several measures were adopted while conducting this study:

1. No incentives were offered to the participants in return for their participation.
2. Verbal consent was obtained from the participants before filling the questionnaire.
3. Participants were informed that their participation in this study is voluntary, no incentives or compensations will be offered in return, and that they have the right to withdraw from the study at any stage. The scientific value of their participation was explained in the verbal consent.
4. The contact information of the principal investigators was provided for participants.
5. All the participants' information was kept private by keeping it in a secured folder in a password-protected computer owned by the study investigators. No information was shared with any other individuals or entities.

RESULTS

A total of 250 mothers were included in this study, the mean \pm SD for age was 28 ± 6.3 years ranging between 17 and

Table 1: Sociodemographic characteristics among studied mothers

Sociological character	n (%)
Age (years)	
<18	5 (2)
18–27	121 (48.4)
28–37	111 (44.4)
>37	13 (5.2)
Residency	
Urban	204 (81.6)
Rural	46 (18.4)
Educational level	
Illiterate	36 (14.4)
Primary	69 (27.6)
Secondary	70 (28)
Collage and higher	75 (30)
Occupation	
Governmental employee	35 (14)
Unemployee	6 (2.4)
Homemaker	209 (83.6)
Total	250 (100)

Table 2: Parity of studied mothers

Parity	n (%)
Prim gravida	36 (14.4)
1–4	198 (79.2)
≥5	16 (6.4)
Total	250 (100)

45 years, and the age distribution is shown in Table 1. Two hundred and four (81.6%) of mothers were from urban area. Thirty-six (14.4%) of mother were illiterate and 209 (83.6%) of mothers were homemaker.

Only 6 (2.4%) mothers had no any ANC visit during their pregnancy, [Figure 1].

Parity of studied mothers shown that 198 (79.2%) of mother had parity between 1 and 4, [Table 2].

The number of mothers undergone elective C/S were 63.6% (159) mothers and the number of mothers undergone emergency C/S were 36.4% (91) mothers, [Figure 2].

The indication of elective C/S showed that history of previous C/S represented 120 (75.5%) of causes, other causes are shown in Table 3.

Fetal distress represents the first cause of emergency C/S 26 (28.6%), other causes are showed in Table 4.

The rate of C/S during period of 4 months was 53.6% and the rate of cesarian section according to months is shown in Figure 3.

Among the mothers with an age of equal to or <27 years, 41.3% underwent emergency C/S, while only 15.4%^[2] of those with an age over 35 years underwent C/S. However,

Table 3: Indication of elective cesarean section

Indication of elective C/S	n (%)
Previous CS	120 (75.5)
HT	
Gestational HT	24 (15)
Chronic HT	7 (4.4)
DM	
Gestational DM	14 (8.8)
Chronic DM	8 (5)
Infertility	
Primary	2 (1.6)
Secondary	3 (1.9)
APH	8 (5)
Multiple pregnancy	7 (4.4)
Postdate	6 (3.8)
Preeclampsia	5 (3.1)
Polyhydramnios	5 (3.1)
Mal-presentation	4 (2.5)
Oligohydramnios	2 (1.3)
Mother demand	8 (5.1)

APH: Antepartum hemorrhage, HT: Hypertension, DM: Diabetes mellitus, C/S: Cesarean section

Table 4: Indication of emergency cesarean section

Indication of emergency C/S	n (%)
Fetal distress	26 (28.6)
HT	
Gestational HT	3 (3.3)
Chronic HT	2 (2.1)
Gestational DM	5 (5.5)
APH	17 (18.7)
Failure induction labour/obstructed labour	23 (25.2)
Preeclampsia	7 (7.7)
Eclampsia	4 (4.4)
Oligohydramnios	6 (6.6)
Rupture membrane	5 (5.6)
Polyhydramnios	4 (4.4)
Cord prolapse	4 (4.4)
Mal-presentation	1 (1)
Multiple pregnancy	1 (1)

APH: Antepartum hemorrhage, HT: Hypertension, DM: Diabetes mellitus, C/S: Cesarean section

no significant association was found between age and type of C/S ($P = 0.121$).

In addition, none of the other characteristics of mothers showed any significant association with the type of C/S performed ($P > 0.05$) [Table 5].

Among the mothers who had ANC, 156 (63.9%) underwent elective C/S, while 3 (50%) of those with No ANC had elective C/S. There was no significant association found between the ANC visit history and the type of C/S performed ($P = 0.48$). Parity was also found to have no significant association with the type of C/S performed ($P = 0.137$) [Table 6].

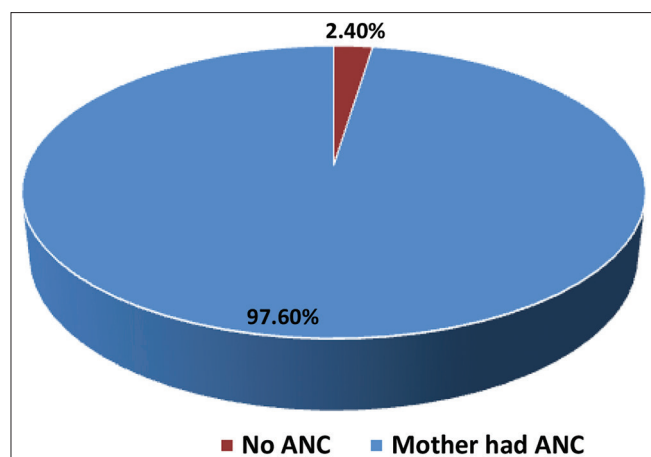


Figure 1: History of any antenatal care visit among studied patients. ANC: Antenatal care

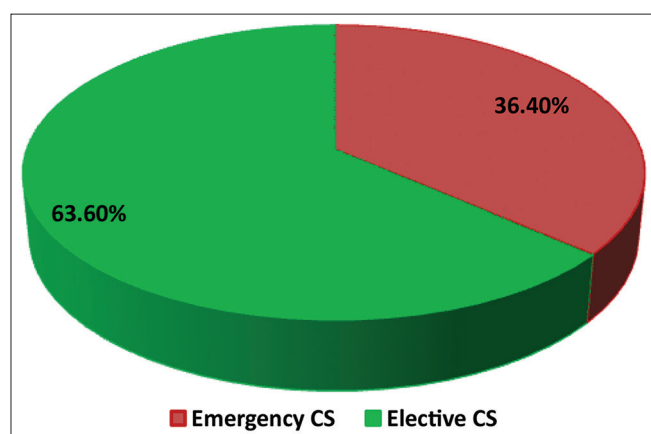


Figure 2: Distribution of the sample according to the type of cesarian section

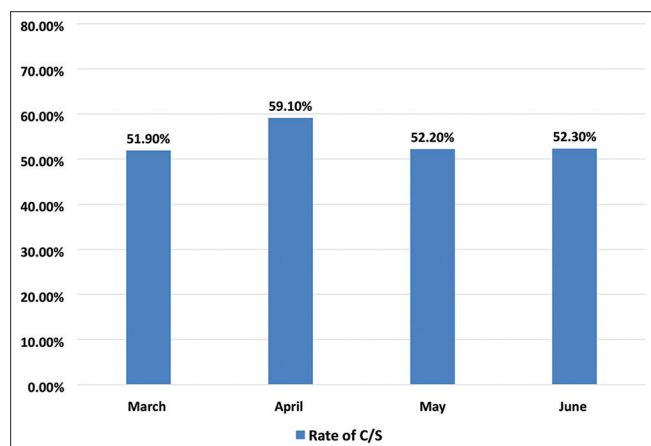


Figure 3: Rate of C/S during 4 months

Medical history of patients regarding hypertension and diabetes mellitus showed a significant association with type of C/S, where the patients with positive medical history significantly had more elective than emergency type of C/S [Table 7].

Table 5: Association of sociodemographic characteristics with type of cesarean section

Sociodemographic character	Type of C/S		P
	Emergency, n (%)	Elective, n (%)	
Age (years)			
≤27	52 (41.3)	74 (58.7)	0.121*
28–35	37 (33.3)	74 (66.7)	
>35	2 (15.4)	11 (84.6)	
Residency			
Urban	77 (37.7)	127 (62.3)	0.35*
Rural	14 (30.4)	32 (69.6)	
Educational level			
Illiterate	15 (41.7)	21 (58.3)	0.102*
Primary	24 (34.8)	45 (65.2)	
Secondary	32 (45.7)	38 (54.3)	
Collage and higher	20 (26.7)	55 (73.3)	
Occupation			
Employee	10 (24.4)	31 (75.6)	0.08*
Housewife	81 (38.8)	128 (61.2)	
Total	91 (36.4)	159 (63.6)	250

*Chi-square test, significant ≤ 0.05 . C/S: Cesarean section

Table 6: Association of antenatal care and parity with type of cesarean section

Variable	Type of C/S		P
	Emergency, n (%)	Elective, n (%)	
History of any ANC			
No	3 (50)	3 (50)	0.48**
Yes	88 (36.1)	156 (63.9)	
Parity			
Prim gravida	18 (50)	18 (50)	0.137*
1–4	69 (34.8)	129 (65.2)	
≥5	4 (25)	12 (75)	
Total	91 (36.4)	159 (63.6)	250

*Chi-square test, **Fisher's exact test, significant ≤ 0.05 . ANC: Antenatal care, C/S: Cesarean section

DISCUSSION

The main finding of the study is the high rate of CS (53.6%). The high rate of CS in this study may be attributed to the study conducted in AL-Yarmouk Teaching Hospital which is one of tertiary hospital known to deal with critical situation, in addition to referral of cases from peripheral areas. This rate is equal to the rates from lastly published Iraqi annual statistical report (2020) by Iraqi Ministry of Health were the percentage of CS in Baghdad was 52.6%.^[12]

This study agrees with Muhei and Jamil at 2018 when the rate of CS was 47.1%.^[16] Furthermore, the result is supported by Habib *et al.* in conclusion of her study (The CS rate was high 66%).^[17]

Worldwide, CS rate has increased from 6.7% in 1990, to 19.1% in 2014; the increase is also likely influenced by cultural beliefs as well as socioeconomic and legal.^[18] In Egypt, cesarean

Table 7: Association of medical history with type of cesarean section

Variable	Type of C/S		P
	Emergency, n (%)	Elective, n (%)	
History of HT			
Negative	86 (40.2)	128 (59.8)	0.008**
HT disorder in pregnancy	3 (11.1)	24 (88.9)	
Chronic HT	2 (22.2)	7 (77.8)	
History of DM			
Negative	86 (38.6)	137 (61.4)	0.05*
Gestational diabetes	5 (26.3)	14 (73.7)	
Chronic DM	0	8 (100)	
Total	91 (36.4)	159 (63.6)	250

*Chi-square test, significant ≤ 0.05 . HT: Hypertension, DM: Diabetes mellitus, C/S: Cesarean section, **highly significant

rate increased from 4.6% to 10% between 1992 and 2000.^[19] Ba'aqeel reported that over the period between 1997 and 2006, CS delivery rate in Saudi Arabia increased from 10.6% to 19.1%.^[20] In Jordan cesarean rate increased from 18.5% to 37.5% between 2008 and 2013.^[21] And also recent Lebanese study reported high rate of CS reach to 48%.^[22]

In the United States in 1970, the rate of cesarean was 5.5% as reported by the National Center for Health Statistics and the Center for Disease Control and Prevention. Cesarean delivery increased from 20.7% in 1996 to 31.1% in 2006.^[23] Differences in healthcare access, healthcare system factors, and approaches to perinatal care between and within countries may also influence the choices women or professionals make.^[24]

CS is done either for emergency or planned reasons. As regard to emergency CS, the most common reported reasons in the current study were fetal distress (28.6%). These results are consistent with the findings of previous study done in Baghdad^[25] where the fetal distress represent 27.9% of emergency causes of CS, also similar to a study in Jordan^[26] and study in Bangladesh^[27] where the most common reasons cited for emergency CS were fetal distress and prolonged labor.

In regards to planned CS, the most frequent reason was scarred uterus which mostly indicates previous CS. These results are consistent with studies done in Bangladesh^[27] and Jordan^[26] where the most common reasons cited for planned CS were previous CS. It is claimed that if pregnant women had a past history of CS the next delivery will be mostly by CS. Although a previous CS does not necessarily mean a scheduled CS in next pregnancy.^[28]

In study done by Al Rowaily *et al.* in Saudi Arabia, they concluded that the main indications for emergency CS were difficult labor, fetal distress, breech presentation, and antepartum hemorrhage, whereas previous CS, breech presentation, maternal request, and maternal conditions were the main indications for elective CS.^[29]

“Penna and Arulkumaran” had found a significant association between educational level and type of delivery, which may be related to sampling variation.^[30] However, the results of our study differ from theirs, as we found no significant association between educational level and type of delivery.

Sociodemographic character showed nonsignificant association with type of CS which is consistent with other studies such as the Greece study conducted by Antonio *et al.*^[31]

In regard to ANC visit and type of CS, this study showed no significant association between ANC visit and type of CS. According to the WHO guideline for ANC visit (ANC models with a minimum of eight contacts are recommended to reduce perinatal mortality and improve women's experience of care), as ANC helps in early diagnosis and management of both maternal and fetal comorbidities occurring during pregnancy and decrease postdelivery complication. In this study, the ANC visits were recorded as either “yes” or “no” since the participants were unable to recall the number of visits they had attended.

The current study showed a significantly high percentage of the patients with positive medical history regarding hypertension and diabetic mellitus had undergone elective CS, the study finding was supported by Amjad *et al.*'s study,^[32] the reason behind this finding may be related to fact that pregnant with a positive medical history regarded as high risk pregnancy and are usually scheduled for elective CS.

CONCLUSION

1. The rate of C/S during the period of 4 months was more than half of all deliveries
2. Two-thirds of all CS in this study were elective CSs
3. Medical history of patients regarding hypertension and diabetic mellitus had shown a significant association with type of C/S.

The study recommended to set local guidelines to be follow for all obstetricians at the private and public hospital to restrict the rate of CS.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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