

Assessment of Clinical Indications for Caesarean Section in Mosul City Hospitals: A Cross-Sectional Study

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ABSTRACT

Background: Caesarean section is traditionally done when a vaginal delivery would put the mother or fetus's life at risk. Knowing the indications of the caesarean section will help to have an impression of this common type of the obstetric procedures. The aim of the current study was to examine the indications of caesarean sections which are undertaken in Mosul city hospitals.

Methods: A cross-sectional study was done at eight hospitals in Mosul city and a sample of 671 women who were delivered by caesarean section was included in this study. The necessary agreement was obtained from all the participants in the sample.

Study period: the study was done during the period from 15th November 2019 to 15th April 2020. The information was taken by direct interview with the women who were delivered by caesarean section and from their hospital case sheets.

Results: Primary caesarean section was reported in 45.2% of cases followed by previous two or more CS in 32.3% and those with previous one caesarean section with other causes 22.5% with a very highly statistically significant difference (P=0.001). Fetal distress was the indication for primary caesarean section in one-quarter of cases 25.4% with a very highly statistically significant difference (P=0.000) from other causes. Maternal request constituted 11.5% of indications among the participant women and it constituted one-quarter of causes among women with previous one caesarean section (P=0.000).

Conclusions and recommendations: Primary caesarean section constituted the highest number among caesarean section indications in the current study, followed by previous two or more caesarean section and then previous caesarean section with other causes. Fetal distress was the highest indication in primary caesarean section cases. The study recommends to improve health education to the mother about the risk of caesarean section and possibility of normal delivery after primary caesarean section.

Keywords: Caesarean section, primary caesarean section, indications for caesarean, maternal request, Mosul city.

تقييم الدواعي السريرية للولادة القيصرية في مستشفيات مدينة الموصل: دراسة المقطع العرضي

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الخلاصة

الخلفية: تتم الولادة القيصرية على نحو تقليدي عندما تعرض الولادة الطبيعية حياة الأم أو الجنين للخطر. ستساعد معرفة دواعي الولادة القيصرية في تكوين انطباع عن هذا النوع الشائع من إجراءات التوليد والهدف من الدراسة الحالية هو فهم دواعي الولادة القيصرية في مستشفيات مدينة الموصل.

الطريقة: تم إجراء دراسة المقطع العرضي في ثماني مستشفيات في مدينة الموصل وتم اختيار عينة مكونة من 671 امرأة ولدت بالولادة القيصرية في اثناء الدراسة كما واخذت الموافقات الضرورية من جميع النسوة في العينة.

فترة الدراسة: هي من ١٥ تشرين الثاني ٢٠١٩ إلى ١٥ نيسان ٢٠٢٠. تم أخذ المعلومات من خلال المقابلة المباشرة مع النساء اللواتي ولدن بعملية قيصرية ومن الملف السريري للمريضة في المستشفى.

النتائج: الولادة القيصرية الأولية سجلت في ٤٥.٢٪ من الحالات تليها الولادة القيصرية بسبب تاريخ عمليتين قيصرتين أو أكثر في ٣٢.٣٪ ثم الولادة القيصرية في النساء اللواتي لديهن تاريخ عملية قيصرية واحدة سابقة مع وجود سبب آخر في ٢٢.٥٪ وكانت ذات دلالة احصائية معنوية عالية جدا ($P=0.001$). الضائقة الجنينية كانت من دواعي الولادة القيصرية الأولية في ربع الحالات ٢٥.٤٪ وكانت ذات دلالة احصائية معنوية عالية جدا ($P=0.000$).

شكلت رغبة الأم للولادة بالعملية القيصرية ١١.٥٪ من الدواعي بين النساء المشاركات وشكلت واحدًا من ربع الأسباب بين النساء اللواتي خضعن لعملية قيصرية سابقة ($P=0.000$).

الاستنتاج والتوصيات: شكلت الولادة القيصرية الأولية اعلى عدد من بين الدواعي في هذه الدراسة ثم تاريخ عمليتين قيصرتين أو أكثر ثم تتبعها تاريخ عملية قيصرية واحدة سابقة مع اسباب اخرى. الضائقة الجنينية كانت من اعلى الدواعي لحالات للعملية القيصرية الأولية. وتوصي الدراسة الحالية بتحسين التثقيف الصحي حول رعاية ما قبل الولادة.

الكلمات المفتاحية: الولادة القيصرية، الولادة القيصرية الأولية، دواعي الولادة القيصرية، رغبة الأم، مدينة الموصل.

INTRODUCTION

Caesarean section (CS) is the delivery of a fetus through surgical incision which done through the abdominal wall (laparotomy) and the uterine wall (hysterotomy) and it is known as caesarean delivery or C-section¹. It was initiated as a lifesaving procedure in clinical practice for both the fetus and the mother and it was considered as one of the most emergency obstetrical operation done when unexpected complications were occurred during labor and it can be scheduled and done electively. Although CS was relatively safe but still it is a major surgery and recovery was relatively longer and more complications than that of the vaginal birth².

World Health Organization (WHO) stated that CS should be implemented when only there was a medical causes but some of CS were implemented without any medical cause only upon maternal request³.

There are many different indications for CS and the four major indications which accounting for more than 70% of all operations are previous multiple CS; abnormal presentation (commonly breech presentation); failure to progress of labor; suspected fetal distress and other indications such as placenta praevia, abruptio placentae, multiple pregnancy, maternal disease and fetal disease⁴. Indications for CS can be divided into absolute and relative indications⁵. Absolute indications when the vaginal delivery was not possible and there was a life threatening condition to the pregnant women and it was about 1-2% of all deliveries. These absolute indications are severe and uncontrolled antepartum hemorrhage, persistent of abnormal presentation, rupture of the uterus⁶, previous two or more CS⁷, absolute cephalo-pelvic disproportion⁸ and atypical cases of CS after the mother death (post mortem birth)⁹. The relative

indications for CS in which the decision to do CS consider the benefit to risk for the mother and the fetus¹⁰ and it include many indications. Previous CS if there are no other indications for CS with it considered as relative indication, as trial of labor after caesarean could be attempted¹¹ with good success rate¹². The other relative indications for CS are dystocia, abnormal presentation, bad obstetrical history, multiple pregnancy, relative cephalo-pelvic disproportion and others. Caesarean section on maternal request defined as CS in the absence of fetal and maternal indications for CS and it is one of the causes for increase in CS rate¹³. Normally people are afraid from any surgery except CS and many of them insist on CS from the beginning of their pregnancy as well as they came to hospital very happy like when go to a wedding and they really put pressure on her obstetrician to deliver by CS¹⁴. The mother who preferred CS reflects the usual idea in society that elective CS is safer than vaginal delivery for both mother and fetus, due to fear from vaginal delivery, to avoid delivery pain, to obtain tubal ligation or due to social reasons including choosing good timing^{13,15}.

PATIENTS AND METHODS

Before starting to collect information firstly approval was taken from the College of Medicine - University of Mosul and directed to the Nineveh Health Directorate and then the Training Center and Human Development was approved for the research project. A task facilitation was mentioned that includes the name of the hospitals covered in the study after which the letter of the task was handed over to the hospital director or his representative in order to facilitate the task of collecting information from patients and also taking statistical information from that hospital.

The current study is a descriptive cross-sectional study which was done at all maternity hospitals in Mosul city, from the right side four hospitals included, three governmental hospitals (Al-Batool, Nablus and Mosul General Hospital) and one private hospital (Nineveh Private Hospital) and from the left side also four hospitals included two governmental hospitals (Al-Khansa and Al-Salam Teaching Hospital) and two private hospitals (Al-Zahrawi and Al-Rabee Private Hospitals). The period of data collection started from the 15th November 2019 to 15 April 2020.

Sample size are 671 women who delivered by CS. Method of taking the sample was random continuous sampling. The inclusion criteria were woman delivered by CS in Mosul city hospitals and the exclusion criteria were woman delivered by vaginal delivery, instrumental deliveries and any woman refused to participate in the current study.

The information was collected from women after clarifying the idea (aim and method) of the study. A verbal agreement with written consent were taken from all the participants in the sample. The information were analyzed using SPSS version 23, Chi-square test (Goodness of Fit) was used for strata justification, equal proportions was used when performing chi-square test, P value of (< 0.05) was considered as statistically significant.

RESULTS

Six hundred seventy-one women who underwent CS in Mosul city hospital were included in the study. About three quarters (70.6%) of the study sample were in the age group 20-35 years, the mean \pm SD of age was 28.89 ± 6.61 years. The women who were living in urban area constituted 59.5% of the sample. The highest number had primary school education 48.4% (P= 0.000). Three-quarters of women (75.3%) were multiparous with significant difference (P=0.000) as it is shown in table 1.

Table 1: Some demographic and obstetrical characteristics of the study population

Parameters (n=671)	No.	%	P-value *
Age (years)			
< 20	49	7.3	0.000
20 – 35	474	70.6	
\geq 35	148	22.1	
Mean age \pm SD	28.89 \pm 6.61		
Place of residence			
Urban	399	59.5	0.000
Rural	272	40.5	
Maternal education			
Illiterate	177	26.4	0.000
Primary school	325	48.4	
Secondary school	98	14.6	
University	67	10.0	
Higher education	4	0.6	
Parity			
0	166	24.7	0.000
1 – 5	438	65.3	
\geq 6	67	10.0	
Total	671	100	

* Chi-square test (Goodness of Fit) was used.

Among study participants women, elective CS constituted more than half of the cases 57.5% when compared with emergency CS 42.5% with significant statistical difference (P = 0.000) and there were two groups of women according to the history of previous CS. First group for women with unscarred uterus (no history of CS) which constituted 45.2% and the second group for women with scarred uterus (previous history of CS) which constituted 54.8% (P= 0.012). The highest number of previous history of CS was 6. History of previous one CS constituted 41% of cases in the second group with significant statistical difference (P= 0.000) as showed in table 2.

Table 2: Distribution of the study population according to the types of CS and history of previous caesarean section

Type of CS	No.(n=671)	%	P-value*
Elective	386	57.5	0.000
Emergency	285	42.5	
History of previous CS			
No history of CS (unscarred uterus)	303	45.2	0.012
History of CS (scarred uterus) (n=368)	368	54.8	
1	151	41.0	0.000
2	98	26.6	
3	68	18.5	
4	34	9.2	
5	12	3.3	
6	5	1.4	

* Chi-square test (Goodness of Fit) was used.

Among 671 participated women, 22.5% of them had history of previous one CS with other cause while 32.3% of the participants had history of previous two or more CS. The remaining 45.2 % from the study population were primary CS. In table 3 shows that the most common causes of primary CS was fetal distress as it constituted one quarter of the all causes (25.4%) with a significant statistical difference (P= 0.000), multiple causes for indication for CS was 19.8%. while abnormal presentation cause constitute 18.2% from all causes. Failure to progress of labor formed 13.2%, maternal request (without any other obstetrical indication) was reported in 12.2%, antepartum hemorrhage 8.6%. Obstructed labor (midwife interference) represent 1.9% of the causes and fetal abnormality (hydrocephalus) was the lowest cause of primary CS indications 0.7%.

Table 3: Indications of Primary caesarean section among study population

Indications of Primary CS (n=303)	No.	%	P-value*
Fetal distress	77	25.4	0.000
More than one cause for CS (other than previous CS)	60	19.8	
Abnormal presentation	55	18.2	
Failure to progress of labor	40	13.2	
Maternal request	37	12.2	
Antepartum hemorrhage	26	8.6	
Obstructed labor (midwife interference)	6	1.9	
Fetal abnormality (hydrocephalus)	2	0.7	
Total	303	100.0	

* Chi-square test (Goodness of Fit) was used.

Evaluation of causes of CS in women with previous one CS showed that quarter of cases 26.5% was due to maternal request which had significant statistical difference (P= 0.000) from other causes. Failure to progress of labor and fetal distress constituted the second and third causes and it reported in 19.9% and 17.9% respectively among them and then followed by abnormal presentation 13.9%, hypertensive disorder of pregnancy 8.6%, postdate 6.6%, antepartum hemorrhage 4.0%, multiple pregnancy 1.9% and fetal abnormality (hydrocephalus) 0.7% as appeared in table 4.

Table 4: Distribution of the study population according to the history of other cause with previous one CS

Other cause with previous one CS	No.	%	P-value*
Maternal request	40	26.5	0.000
Failure to progress of labor	30	19.9	
Fetal distress	27	17.9	
Abnormal presentation	21	13.9	
Hypertensive disorder of pregnancy	13	8.6	
Postdate	10	6.6	
Antepartum hemorrhage	6	4.0	
Multiple pregnancy	3	1.9	
Fetal abnormality (hydrocephalus)	1	0.7	
Total	151	100.0	—

* Chi-square test (Goodness of Fit) was used.

Seventy-seven (11.5%) of participants women delivered by CS due to maternal request. Fifteen women (19.5%) were reported as a cause of maternal request for fear of vaginal delivery, social reasons, to obtain tubal ligation and believing of more safety to the mother and to the newborn (the number was equal by chance) and the lowest cause for maternal request for CS was avoiding delivery pain (2.6%) with no significant statistical difference ($P= 0.052$) as appeared in table 5.

Table 5: Distribution of the study population according to the causes of the maternal request

Maternal request	No.	%	P-value*
Fear of vaginal delivery	15	19.5	0.052
Social reasons	15	19.5	
To obtain tubal ligation	15	19.5	
Believing of more safety to the mother	15	19.5	
Believing of more safety to the newborn	15	19.5	
To avoid delivery pain	2	2.6	
Total	77	100.0	—

DISCUSSION

This study gives idea about indications for CS and some characters of women which could be related to CS in Mosul city.

Our study finding showed that most age group of women delivered by CS was 20-35 years because in our locality the women with the age of ≥ 35 preferred home deliveries especially if they had previous history of safe home deliveries. The rate of CS was low in age group of < 20 years due to less fertility rate¹⁶. The finding was similar to a study in India¹⁶ which showed that the CS rate was also more in age group of 20-35 years as it constituted 55.6%.

Due to the higher obstetrical facilities and services, high numbers of maternal health center and availability of private health care services in urban area in addition to the presence of hospitals in some rural areas where rural women go to delivered there, this study showed a higher rate of CS in women lived in urban region that similar to other studies^{17,18} in Vietnam and in the Maternity Teaching Hospital in Erbil City, Iraq.

In this study, three quarters of the women delivered by CS had education of primary school level or illiterate and this high percentage could be explained by the fact that low educational level give less importance to ante natal care (ANC) which make complications at time of deliveries more as ANC contributed to a better birth outcome¹⁹. This study was similar to study in Kirkuk

governorate²⁰ where 70% of study sample were primary school level or illiterate.

Concerning parity, multiparous women who had 1-5 children and delivered by CS constituted three quarters of CS in this study and this high rate of CS in those women could be due to the preference of grand multiparous women to home deliveries and majority of primiparous women had regular ANC in primary health care centers for vaccination and examination. This percentage (75.3%) was slightly less than percentage reported in study⁽¹⁸⁾ in Erbil City, Iraq in which CS percentage among multiparous 83.5%.

Elective CS constituted the higher rate 57.5% among caesarean deliveries in this study as previous two or more CS which is unavoidable cause for CS and maternal request for elective CS are seen in high numbers in this study. It is lower than the study which was done in a tertiary care hospital at Kolkata²¹ in which elective CS was 81.1%.

In this study, women with history of scared uterus constituted the higher rate of CS 54.8% and the rate was higher than the rate in a study done in Muhimbili National referral hospital in Tanzania²² in which repeated CS constituted 30.2%.

Mascarello KC²³ encouraged repeated CS for women who had previous scar but "American College of Obstetricians and Gynecologists"²⁴ encouraged vaginal birth after CS (VBAC) because it has been associated with fewer complications than repeated CS. There were other encouraging studies to allow trial of labor after one scar and one of these studies was done before few years in one of Mosul hospitals (Al-Batool Hospital)⁽¹²⁾ which showed successful rate of vaginal birth after CS in 82%. So in Mosul hospitals, trial of labor after caesarean was allowed after good evaluation of women and their indications of previous scar in their work. In the current study, the rate of previous one CS with other cause was reported in 22.5% and it was lower than the rate in study done in a Bangladesh²⁵ where the percentage was 35%, this difference could be due to the level of the health care facilities. In our study the major three causes in addition to previous scar were maternal request 26.5% followed by failure to progress of labor 19.9% and fetal distress 17.9%. Al-Wazzan study¹² showed that no progress of labor constituted 38% followed by abnormal presentation 22% and fetal distress 9% in cases with previous CS, this difference could be related to difference in the medical approach for suspected cases of fetal distress and the increase of fear from litigation.

In our locality, all cases of previous two or more CS delivered by CS and it considered as an absolute indications for CS due to very busy hospitals in our locality in addition to the difference

in health facilities between the centers and unavailability of continuous monitoring of intra uterine pressure and fetal heart rate monitoring for that reasons CS after two scar considered as unavoidable indications for CS and it 's rate in this study was 32.3% which was higher than the rate in study done in Iran ²⁷ which revealed that 16.1% of the women who had two or more CS. Study ²⁶ done in India which was reported no trial of vaginal delivery was given to women with previous two or more CS.

The primary CS constituted 45.2% which was nearly the rate in study done in Iran ²⁷ 47.1%. In the current study the top three indications for primary CS 45.2% were fetal distress 25.4% followed by more than one cause for CS 19.8% and abnormal presentation 18.2%. Comparing the indications of CS with other regions such as Tanzania ²⁸ showed that the three common indications for CS were obstructed labor 30%, abnormal presentation 20% and fetal distress 11%. These differences could be explained by difference in health care facilities. Fetal distress was the indication of CS in quarter of cases and this could be explained by the unavailability of continuous monitoring cardiotocography (CTG) and fetal blood sampling to check the fetal wellbeing.

Unnecessary CS due to maternal request in this study could be related in most of the women to the fear of vaginal delivery, social reasons, obtaining tubal ligation, believing of more safety to the mother and the newborn and the least cause for maternal request was to avoid delivery pain. In the current study CS on maternal request constituted 11.5% and it was higher than the rate reported in the United States ²⁹ as reported 2.5%.

CONCLUSIONS AND RECOMENDATIONS

The main indications for CS in the present study were primary CS followed by previous two or more CS (unavoidable indication) and then followed by previous scar with other causes. Fetal distress was the main cause for primary CS. Maternal request was founded in some cases due to different explanation for the request. It is recommended to improve health education to the mother about the risk of CS and possibility of normal delivery after primary CS in order to decrease incidence and decrease maternal request for that.

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