First Cesarean Section Indications, Maternal and Fetal Outcomes in Erbil City Maternity Teaching Hospital in 2021

Tazreen Mohammadamin Qader[1*], Zainab Muhsin Zwain[2]

Abstract

Objectives: An epidemiological study of cesarean section indications and maternal and fetal outcomes can help health policymakers address the high prevalence of this surgery as a threat to public health. Therefore, this study was conducted to evaluate the indications for the first cesarean section and its maternal and fetal outcomes.

Methodology: This study is a cross-sectional study that was conducted for 6 months in 2021, in Erbil educational maternity hospital. The sampling method of this study was the convenience method. This study assesses the indications for first CS and identifies complications to maternal and fetal. The study population was all pregnant women who were candidates for CS for the first time.

Result: The main indications for the first CS were fetal distress (29.1%) and mal-presentation (23%). The most common maternal complications were the need for blood transfusion (8.8%) and the most common neonatal complication was low APGAR score (21.8%). The results showed that the age group, gravidity and Indication for Cesarean section there is a significant difference between two groups of mothers with and without complications. Age group, sex of neonatal and blood group is a significant difference between two groups of neonatal with and without complications.

Conclusion: According to this study, maternal and neonatal complications in natural childbirth are less than CS, it is recommended that CS be considered only if there is a medical indication that the mother or baby's life is in danger.

Key Words: Cesarean Section, Indications, Maternal Outcomes, Fetal Outcomes.

DOI Number: 10.14704/nq.2022.20.8.NQ44447 **NeuroQuantology 2022; 20(8): 4147-4155**

Introduction

Cesarean section (CS) has been used as a method of terminating pregnancy for two centuries (1). CS may be necessary to protect the mother and baby and it is the most common type of major gynecological surgery (2). The first modern CS was performed by the gynecologist Ferdinand Adolf in 1881 in Germany.

In a global study, Betran et al. (2021) reported an average world CS rate of 21.1%. The lowest rate of CS is in sub-Saharan Africa with a rate of 5% and the highest rate is in Latin America and the Caribbean with a rate of 42.8%. This rate is 25.7% in Europe and 31.6% in North America (3). According to the CDC, the rate of CS in the United States (2020) is 31.7%, and this rate is reported for nulliparous mothers 25.6% (4). Mirkhan-Ahmad et al. (2018) in their study in the Kurdistan region showed that the rate of CS in 2010 increased from 28.5% to 35.8% in 2015 (5).

CS is performed when natural childbirth endangers the life of the mother and her fetus (2). Medical indications for cesarean section are divided into two categories: maternal and fetal.

Corresponding author: Tazreen Mohammadamin Qader
Address: [1*]Department of Obstetrics and Gynecology, Maternity Teaching Hospital, Erbil, Kurdistan Region, Iraq; [2]M.B.CH.B., DOG, FICOG, Department of Obstetrics and Gynecology, College of Medicine, Hawler Medical University, Erbil, Kurdistan Region, Iraq.
E-mail: [1*]tazreenqadir@gmail.com

These include placement of the fetus transversely in the uterus, placement of fetal legs in the lower part and inside the pelvis, umbilical cord around the neck, head-pelvic incompatibility, multiple births, resuscitation CS, excessive prolongation of normal delivery and Lack of progression, entrapment of the umbilical cord inside the vagina and pelvis, and abnormal blood flow to the fetus, fetal stress and suffering, uterine rupture or the possibility of rupture, uncontrollable hypertension or gestational hypertension, increased maternal or fetal heart rate After a long period of rupture of the amniotic sac, placental problems such as placenta Previa or premature separation of the placenta, failure to begin symptoms naturally or artificially, fetus weighing more than four kilograms, maternal genital herpes due to the possibility of transmission to the baby during a normal delivery, having a history of CS, having a history of uterine rupture, uterine abnormalities such as a horned uterus, fetal abnormalities, rare cases of postpartum delivery to save the baby's life (6). Of course, CS is very common at the request of the mother and without medical indication (7). Undoubtedly, changes in social structure, culture, financial ability, different lifestyles from the past, anxiety about natural childbirth, changing risk profiles in older nulliparous women and the general misconception that CS is safe, all intensify the tendency of mothers to choose CS is their method of delivery (6, 8). The World Health Organization (WHO) does not recommend elective CS due to its potential complications (4).

CS is a major surgery and has potential complications for both mother and baby (9). In addition to complications such as infection, limb injury, and the need for blood that may occur during surgery, many side effects such as thromboembolic and other inflammations such as endometritis, may occur to the mother after delivery (10). Of course, some side effects may occur in subsequent pregnancies, such as uterine rupture, infertility, placental abnormalities such as placenta Previa or Actra (11). Congenital suffocation, acute respiratory distress syndrome (ARDS), sepsis, transient tachypnea of the newborn (TTN), soft tissue damage, allergic disorders, type 1 diabetes, and coryza may also occur (12). Mascarello et al. (2017) reported higher mortality, infection, and higher chances of hospitalization in intensive care units after cesarean delivery than normal delivery (13).

Due to the high prevalence of cesarean section in Kurdistan region (5) and need to evaluate the indications of first cesarean sections and identifying ways to prevent these indications and minimizing the need for cesarean sections and Exploring the maternal and fetal co-morbidities accompanying the cesarean sections to make the Physicians aware about them, This study was performed to assess the indications for first cesarean section and identifying its maternal and fetal outcomes.

Methods and Materials

This study is a cross-sectional study that was conducted for 6 months from March 1 to September 22, 2021 in the educational maternity hospital in Erbil. The purpose of this study indicates for the first cesarean section and maternal and fetal outcomes of the first cesarean section. The study population was all pregnant women who were candidates for cesarean section for the first time and were admitted to the delivery room of the maternity hospital. Sampling method of this study was the convenience method. Sampling method of this study was the convenience method. A total of 330 pregnant women who met the inclusion criteria were included in the study.

Data were collected using a checklist obtained from a review of patients' records. The variables studied in this study are in three categories, the first category of variables related to the pregnant mother include: maternal age, maternal blood type, RH, Gravidity: "it is defined as the number of times a woman has been pregnant", Parity: "is defined as the number of times that she has given birth to a fetus with a gestational age of 24 weeks or more, regardless of whether the child was born alive or was stillborn" (14), Miscarriage: "it is defined as the loss of pregnancy less than 20 weeks gestation" (15), duration of pregnancy and classified into 5 causes. These 5 causes include the following: Obstruct or Prolonged labor, Fetal Distress, Cephalopelvic Disproportion, Malpresentation and other. Maternal and fetal outcomes were also examined. Maternal outcomes were divided into the following 10 categories: Paralytic Ileus, Postpartum Hemorrhage, Catheter during Surgery, Wound Infection, Blood Transfusion, Internal Bleeding Operation, Fever, Hematuria, Lower Uterine Segment Extension and NO one. Fetal outcomes also fell into the following 9 categories: Respiratory Problem, Low Apgar score, Thick Meconium, IUGR, Mild Asphyxia, Gastric Lavage,

Dead, Rh incompatibility and NO one. The duration of CS was also evaluated in terms of minutes (it is considered from the beginning of receiving anesthesia until the end of work and the suture of the surgical incision site) and fetal sex. Also, two methods of general and spinal anesthesia were used for cesarean section. The complications of these two methods of anesthesia were also examined at the end.

Inclusion criteria: age ≥18 years, pregnant women (term, singleton) and Obstructed labour or other indication for cesarean section. Exclusion criteria: Younger age (<18 years), Older age (>40 years), Systemic diseases, Early prematurity (<32 weeks). Refused to participate in the study, multiple pregnancy and previous one CS and more. Data analyze with SPSS Ver. 23.

Results

The total number of the studied sample was 330 women undergoing their first Cesarean section. The mean age (SD) of the women was 26.7 (6.6) years, the age range was 14 – 40 years, and the median was 26 years. One third of the women were in the age group 20-24 years as presented in Table 1. It was the first time to become pregnant for more than half (56.4%) of the women, while the rest had been pregnant before. Around two thirds (64.8%) of the women were nulliparous women, and 13.3% had history of miscarriage. The largest proportion (38.2%) of the sample were of blood group 'O', and the least (7.9%) were of blood group 'AB' as presented in Table 1.

Table 1. Basic characteristics of the studied sample

	No.	(%)	Mean (SD)	Median	Min.	Max.
Age (years)			26.7 (6.6)	26	14	40
< 20	32	(9.7)				
20-24	110	(33.3)				
25-29	78	(23.6)				
30-34	68	(20.6)				
≥ 35	42	(12.7)				
Gravidity			2.3 (2.0)	1	1	10
Primigravida	186	(56.4)				
Multigravida	106	(32.1)				
Grand multigravida	38	(11.5)				
Parity			1.1 (1.9)	0	0	10
Nulliparous	214	(64.8)				
Primiparous	32	(9.7)				
Multiparous	64	(19.4)				
Grand multiparous	20	(6.1)				
Miscarriage						
Yes	44	(13.3)	0.19 (0.5)	0	0	3
No	286	(86.7)				
Blood group						
A	90	(27.3)				
B	88	(26.7)				
AB	26	(7.9)				
O	126	(38.2)				
Total	330	(100.0)				

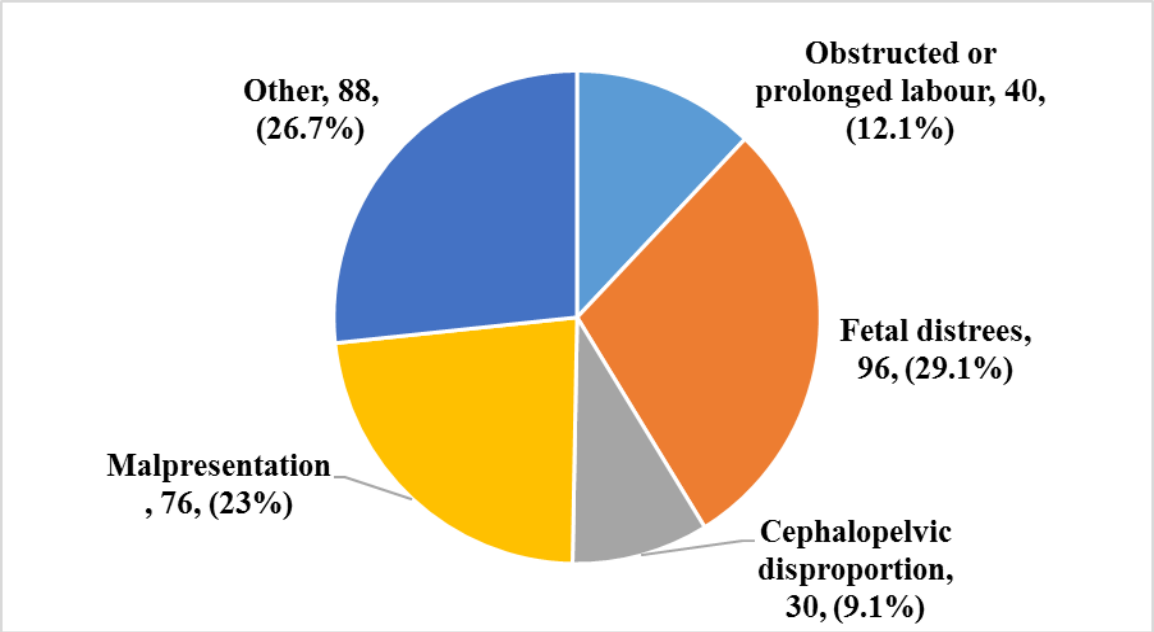

Figure 1. Indication of the first Cesarean Section

The main indications for the first CS were fetal distress (29.1%) and mal-presentation (23%), in addition to the other indications that are presented in Figure 1.

Results showed that 16 patients (4.8%) had complications due to general anesthesia, and 14 patients (4.2%) had complications due to spinal anesthesia. The most common maternal complications were the need for blood transfusion (8.8%), postpartum hemorrhage (4.8%), and hematuria (3.9%).

The most common neonatal complication was low APGAR score (21.8%), respiratory problems (14.5%), and thick meconium (3.6%), in addition to other rare complications mentioned in Table 2.

Table 2. Incidence of neonatal complications

Neonatal complications	No.	(%)
None	189	(57.3)
Low APGAR score	72	(21.8)
Respiratory problem	48	(14.5)
Thick meconium	12	(3.6)
Intra uterine growth retardation	2	(0.6)
Mild asphyxia	2	(0.6)
Gastric lavage	2	(0.6)
Rh incompatibility	2	(0.6)
Death	1	(0.3)
Total	330	(100.0)

It is evident in Table 3 that 30.6% of the women of the whole sample had at least one complication. The table shows that significant high rates of complications were found among women aged 30 years and older, and the lowest rate (18.8%) was found among women aged less than 20 years old ($p < 0.001$). The more the gestational age, the more the rate of complications but the difference was not significant ($p = 0.088$). The rate of complications was the highest (50%) among grand multiparous women compared with 23.7% among primiparous women ($p = 0.002$). No significant association was detected with the duration of the operation ($p = 0.118$). It is evident from table 3 that the lowest rate of complications was when the indication of Cesarean section was fetal distress (18.8%) or cephalo-pelvic disproportion (20%), while the highest rate (48.9%) was detected among women with other causes ($p < 0.001$) (Table 3).

Table 3. Factors associated with maternal complications

		Maternal complications		
		Yes	No	
	N	No. (%)	No. (%)	
Age (years)				
< 20	32	6 (18.8)	26 (81.3)	
20-24	110	20 (18.2)	90 (81.8)	
25-29	78	26 (33.3)	52 (66.7)	
30-34	68	33 (48.5)	35 (51.5)	
≥ 35	42	16 (38.1)	26 (61.9)	< 0.001**
Gestational age (weeks)				
< 37	2	0 (0.0)	2 (100.0)	
37-38	160	41 (25.6)	119 (74.4)	
39-40	168	60 (35.7)	108 (64.3)	0.088*
Gravidity				
Primigravida	186	44 (23.7)	142 (76.3)	
Multigravida	106	38 (35.8)	68 (64.2)	
Grand multigravida	38	19 (50.0)	19 (50.0)	0.002**
Duration of Cesarean section				
≤ 40 minutes	308	91 (29.5)	217 (70.5)	
> 40 minutes	22	10 (45.5)	12 (54.5)	0.118**
Indication for Cesarean section				
Obstructed/prolonged labor	40	12 (30.0)	28 (70.0)	
Fetal distress	96	18 (18.8)	78 (81.3)	
Cephalo-pelvic disproportion	30	6 (20.0)	24 (80.0)	
Mal-presentation	76	22 (28.9)	54 (71.1)	
Others	88	43 (48.9)	45 (51.1)	< 0.001**
Total	330	101 (30.6)	229 (69.4)	

*By Fisher's exact test. **By Chi square test.

A considerable proportion (42.7%) of the neonates had at least one complication, as shown in Table 4. It is evident from the table that the highest rate of neonatal complications (68.8%) was found when the indication for Cesarean section was fetal distress, and the lowest rate (6.7%) was found when the indication was cephalo-pelvic disproportion (p < 0.001). The lowest rate of neonatal complications (15.4%) was when the blood group of the mother was AB, and the highest rate (50%) was among women with blood group A (p = 0.016). No significant association was detected between the neonatal complications with the following factors: age (p = 0.051), gestational age (p = 0.185), gravidity (p = 0.416), duration of Cesarean section (0.789%), and sex of the neonates (p = 0.990) (Table 4).

Table 4. Factors associated with neonatal complications

		Neonatal complications		
		Yes	No	
	N	No. (%)	No. (%)	p
Age (years)				
< 20	32	7 (21.9)	25 (78.1)	
20-24	110	54 (49.1)	56 (50.9)	
25-29	78	36 (46.2)	42 (53.8)	
30-34	68	30 (44.1)	38 (55.9)	
≥ 35	42	14 (33.3)	28 (66.7)	0.051**
Gestational age (weeks)				
< 37	2	2 (100.0)	0 (0.0)	
37-38	160	64 (40.0)	96 (60.0)	
39-40	168	75 (44.6)	93 (55.4)	0.185*
Gravidity				
Primigravida	186	85 (45.7)	101 (54.3)	
Multigravida	106	40 (37.7)	66 (62.3)	
Grand multigravida	38	16 (42.1)	22 (57.9)	0.416**
Duration of Cesarean section				
≤ 40 minutes	308	131 (42.5)	177 (57.5)	
> 40 minutes	22	10 (45.5)	12 (54.5)	0.789**
Indication for Cesarean section				
Obstructed/prolonged labor	40	12 (30.0)	28 (70.0)	
Fetal distress	96	66 (68.8)	30 (31.3)	
Cephalo-pelvic disproportion	30	2 (6.7)	28 (93.3)	
Malpresentation	76	17 (22.4)	59 (77.6)	
Others	88	44 (50.0)	44 (50.0)	< 0.001**
Sex of the neonate				
Male	178	76 (42.7)	102 (57.3)	
Female	152	65 (42.8)	87 (57.2)	0.990**
Blood group				
A	90	45 (50.0)	45 (50.0)	
B	88	40 (45.5)	48 (54.5)	
AB	26	4 (15.4)	22 (84.6)	
O	126	52 (41.3)	74 (58.7)	0.016**
Total	330	141 (42.7)	189 (57.3)	

*By Fisher's exact test. **By Chi square test.

Discussion

The aim of this study was to investigate the indications for the first CS in women and to identify its maternal and fetal consequences in the city of Erbil in 2021. The total number of subjects was 330. In this study, the variables of pregnant women including maternal age, maternal blood group, Gravidity, Parity, miscarriage, duration of pregnancy, along with the factors affecting CS of pregnant women were examined. Maternal and fetal outcomes of CS were also examined.

The results of the present study showed that the mean age of the mother is 26.745 (6.06). In the study of Glazer et al. (2020) In the United States, the mean age of pregnant women who underwent CS was 30.4, with the mean age of pregnant women being higher than this study (16). Also in a study by Batieha AM et al. (2017) In Jordan, the average age of women was 27 years, which is higher than the average age of the present study (17). In Mirzarahimi and Khooshideh (2016) study in Iran, the mean age of pregnant women was 25 years, which was lower than the mean age of this study (18). In general, there is a direct relationship between maternal age and CS. The older the mother is, the better the chances of having a CS.

Investigating the variable Gravidity in a systematic review and meta-analysis by Mascarello at al. (2017) showed that Gravidity has a statistically significant difference between mothers who have labor complications and mothers who do not have labor complications (13). This result is consistent with the result of the present study, which showed complications between two groups of mothers in terms of pregnancy. Also, there was no significant difference between the two groups of mothers with and without complications in terms of the duration of cesarean section While the studies of Mascarello at al. (2017) and et al Pallasmaa et al (2010), there was a significant difference in terms of the duration

of cesarean section, which is not consistent with the results of the present study (13, 19).

Blood group variables were also evaluated in pregnant mothers. According to the results, most blood types of mothers had blood group O and then blood groups A, B and AB, respectively. Comparison of the results with other studies showed that in most studies, the frequency of their blood groups was consistent with the present study (20, 21).

The results of this study showed that the mean gestational age of pregnant mothers participating in the study was 38,624 (0.835), which indicates that all infants are full-term and have a normal delivery time. Comparison of this variable between this study and other studies showed that it is higher than the variable of gestational age in Khooshideh and Mirzarahimi (2017) with a mean of 37.86±0.80 (18). While the mean gestational age in this study is the same as the mean gestational age in the study of Mirtaymuri et al. (2020) with an average of 38 weeks (22). Also, the mean gestational age in this study is higher than the study of Al Rowaily et al (2014) (23).

The results of various studies have shown that the average time a mother will spend in the operating room for a CS is 90 minutes. But more important than this time is the duration of surgery until the end of pregnancy. The mean time taken for CS is consistent with the results of a study by Komoto et al. (2006) (24).

In examining the factors and reasons influencing CS, the most important cause was fetal distress and the second reason for cesarean section (fetal displacement or fetal abnormality) was malpresentation. The results in different studies indicate the existence of different results. In a study by Gedefaw et al. (2020) in Ethiopia to examine the causes of CS in pregnant women and its effects on the mother and fetus, the first reason for cesarean section was Cephalopelvic disproportion and then obstructed labor was the most important reason for CS (10). In the study of Shakibazadeh E et al (2014) which was conducted to investigate the frequency and causes of CS in pregnant women, the most important reason for cesarean section was long-term delivery, while in the present study, the most important cause was fetal distress (25). In a study (2015) by Ahmed et al., Which aimed to investigate the frequency and reasons for cesarean section, the most important reason for cesarean section is the history of previous cesarean section and the second factor for cesarean section is cephalopelvic disproportion (5).

The most commonly identified complications for mothers in this study were Blood Transfusion, Post-partum Hemorrhage, and Hematuria. In a study by Al Rowaily et al. (2014) similar to the present study, Blood Transfusion was the most important known complication for pregnant women and the second cause of HELLP syndrome, which is different from the second cause of the present study (23). In the study by Gedefaw et al. (2020), the most important complications of CS for pregnant women were fever, surgical site infection, maternal mortality, severe anemia, and postpartum hemorrhage which apart from the mortality of pregnant mothers, other complications for the mother are similar to the complications mentioned in the present study (10).

Also, the study of Keag et al. (2018) in terms of urinary complications and administrative problems had the same result as the present study, in which a number of mothers had administrative problems after CS. Also, for some complications such as fever, bleeding, wound infection and the need for blood transfusion, the results of the study were consistent with previous studies (9).

The results of the study by Briand et al. (2012), which was conducted to investigate maternal and neonatal complications related to the type of delivery in 41 referral hospitals in Africa, showed that emergency CS and device delivery will be associated with increased complications with mother and infant (26). For this reason, the present study also examined the effects of CS on the infant. Neonatal respiratory problems were identified as the most important complication of CS and this result was consistent with the study of Briand et al. (2012) that respiratory problems and severe respiratory complications for infants born by CS were important and significant complications (26). Also one of the important complications in the study of Al Rowaily et al. (2014) was respiratory complications and hospitalization in the neonatal intensive care unit (NICU), IUGR, which are also consistent with the results of the present study (23).

Low Apgar score, Asphyxia and meconium problems that were observed in neonates in the present study it is consistent with the results of the study by Gedefaw et al. (2020), which had similar results (10). Complications such as low Apgar score, respiratory distress and other complications were also consistent with other studies (18, 22, 27).

In the study of Pallasmaa et al (2010), which was conducted with the aim of determining the type of

childbirth in Finland, maternal problems and risk factors of childbirth, Fetal distress was the most important reason for cesarean delivery and there was a difference between mothers who had problems and complications caused by cesarean section and mothers who did not have problems, which is consistent with the results of the present study. Also, the results of this study showed that there is a statistically significant difference between the age in two groups of mothers with complications and without complications, which is consistent with the results of the Pallasmaa et al study. Also, the examination of gestational age showed that there is a significant difference between mothers with complications and mothers without complications, which is consistent with the study of Pallasmaa (19).

The results of the present study showed that there is a significant difference in maternal age, maternal blood group, and cesarean indications for mothers between two groups of babies with and without problems, The results of the study of leak at al. (2021) is consistent with this study (28). However, in the current study, gestational age, gravidity, duration of cesarean section and gender did not show a significant difference between the two groups of babies with and without problems, while in other studies these factors were significant (29, 30).

Every method of anesthesia, whether spinal anesthesia or general anesthesia, has its complications. For this reason, the side effects of anesthesia were also examined in this study. The complication of general anesthesia, which is muscle spasm, and the complication of headache, which is a common complication of spinal anesthesia, were also observed in this study, which is consistent with other studies (31, 32).

Conclusion

According to this study, considering that in general, maternal and neonatal complications in natural childbirth are less than CS, it is recommended that CS be considered only if there is a medical indication that the mother or baby's life is in danger. However, necessary measures must be taken for safe natural childbirth and reduction of potential damage to the maternal urogenital system. It is recommended that more studies be performed multicentrically on mothers with different risks and at different gestational ages.

Limitation

This study did not investigate the effect of blood group on cesarean section complications however, it is recommended that a study be performed to evaluate the effect of blood type on mothers who have had a cesarean section to determine its effects.

Acknowledgement

We would like to thank all the parents of the patients who patiently helped in this research. The Vice Chancellor for Research of Erbil University is also thanked for the material and spiritual support of this project.

Author's Contributions

All authors passed the criteria for authorship contribution based on recommendations of the International Committee of Medical Journal Editors.

Funding/Support

This study was supported by a grant received from ……..

Conflict of Interest

The authors have no conflicts of interest to declare.

Data Availability

The authors guarantee that the data of this research will be provided at the request of other researchers.

References

Rosenberg KR, Trevathan WR. Evolutionary perspectives on cesarean section. Evolution, Medicine, and Public Health. 2018; 2018(1): 67-81.

Jenabi E, Khazaei S, Bashirian S, Aghababaei S, Matinnia N. Reasons for elective cesarean section on maternal request: a systematic review. The Journal of Maternal-Fetal & Neonatal Medicine, 2020; 33(22): 3867-72.

Betran AP, Ye J, Moller A-B, Souza JP, Zhang J. Trends and projections of caesarean section rates: global and regional estimates. BMJ Global Health, 2021; 6(6): e005671.

Begum T, Saif-Ur-Rahman KM. Global incidence of caesarean deliveries on maternal request: a systematic review and meta-regression. an International journal of obstetrics and gynaecology, 2021; 128(5): 798-806.

Ahmed HM, Namir A. Rate and indications of cesarean section in the Maternity Teaching Hospital in Erbil City, Kurdistan region, Iraq. Zanco Journal of Medical Sciences (Zanco J Med Sci.,), 2018; 22(2): 148-54.

Saraya YS, Alashkar AH, Ali MA, Rajab AM, Saquib N. Indications and rate of first cesarean delivery in central

region's maternity and children hospital. Saudi Med J., 2019; 40(12): 1251-5.

Singh N, Pradeep Y, Jauhari S. Indications and Determinants of Cesarean Section: A Cross-Sectional Study. Int J Appl Basic Med Res., 2020; 10(4): 280-5.

Morton R, Burton AE, Kumar P, Hyett JA, Phipps H, McGeechan K, et al. Cesarean delivery: Trend in indications over three decades within a major city hospital network. Acta obstetricia et gynecologica Scandinavica, 2020; 99(7): 909-16.

Keag OE, Norman JE, Stock SJ. Long-term risks and benefits associated with cesarean delivery for mother, baby, and subsequent pregnancies: Systematic review and meta-analysis. PLOS Medicine, 2018; 15(1): e1002494.

Gedefaw G, Demis A, Alemnew B, Wondmieneh A, Getie A, Waltengus F. Prevalence, indications, and outcomes of caesarean section deliveries in Ethiopia: a systematic review and meta-analysis. Patient Safety in Surgery, 2020; 14(1): 11.

Yang X.J, Sun S.S. Comparison of maternal and fetal complications in elective and emergency cesarean section: a systematic review and meta-analysis. Archives of Gynecology and Obstetrics, 2017; 296(3): 503-12.

Higgins D, Karmaus W, Jiang Y, Banerjee P, Sulaiman IM, Arshad HS. Infant wheezing and prenatal antibiotic exposure and mode of delivery: a prospective birth cohort study. Journal of Asthma, 2021; 58(6): 770-81.

Mascarello KC, Horta BL, Silveira MF. Maternal complications and cesarean section without indication: systematic review and meta-analysis. Revista de saude publica, 2017; 51(105): 1-12.

Gregory KD, Ramos DE, Jauniaux ERM. Chapter 6 - Preconception and Prenatal Care. In: Gabbe SG, Niebyl JR, Simpson JL, Landon MB, Galan HL, Jauniaux ERM, et al., editors. Obstetrics: Normal and Problem Pregnancies (Seventh Edition). Philadelphia: Elsevier; 2017, 102-21.e3.

C.D, VH. S. Miscarriage [Updated 2022 May 8]. In: StatPearls [Internet], Treasure Island (FL): StatPearls Publishing; 2022 Jan.

Glazer KB, Danilack VA. Term Labor Induction and Cesarean Delivery Risk among Obese Women with and without Comorbidities. American journal of perinatology, 2022; 39(2): 154-64.

Batieha A, Al-Daradkah S, Khader Y, Basha A, Sabet F, Athamneh T, et al. Cesarean section: incidence, causes, associated factors and outcomes: a national prospective study from Jordan. Gynecol Obstet Case Rep., 2017; 3(3): 55.

Khooshideh M, Mirzarahimi T. The comparison of maternal and neonatal outcomes of normal vaginal delivery versus unplanned cesarean section delivery. Journal of Ardabil University of Medical Sciences, 2017; 17(1): 122-32.

Pallasmaa N, Ekblad U, Aitokallio-Tallberg A, Uotila J, Raudaskoski T, Ulander VM, et al. Cesarean delivery in Finland: maternal complications and obstetric risk factors. Acta obstetricia et gynecologica Scandinavica, 2010; 89(7): 896-902.

Ali-Saleh M, Lavie O, Abramov Y. Evaluation of blood type as a potential risk factor for early postpartum hemorrhage. PLOS ONE, 2019; 14(4): e0214840.

Nimmaanrat S, Thongkumdee W, Geater AF, Oofuvong M, Benjhawaleemas P. Is ABO Blood Group a Predictive Factor for the Amount of Opioid Consumption in the First 24 Hours After Cesarean Section? J Pain Res., 2021; 14: 3585-92.

Mirtaymori M, Pourhosseini SA, Emadzadeh M, Yousefi N, Moein Darbari S. Evaluation of maternal and fetal complications in normal delivery after cesarean section. Iranian Journal of Obstetrics, Gynecology and Infertility, 2020; 23(8): 1-7.

Al Rowaily MA, Alsalem FA, Abolfotouh MA. Cesarean section in a high-parity community in Saudi Arabia: clinical indications and obstetric outcomes. BMC Pregnancy and Childbirth., 2014; 14(1): 92.

Komoto Y, Shimoya K, Shimizu T, Kimura T, Hayashi S, Temma-Asano K, et al. Prospective study of non-closure or closure of the peritoneum at cesarean delivery in 124 women: Impact of prior peritoneal closure at primary cesarean on the interval time between first cesarean section and the next pregnancy and significant adhesion at second cesarean. Journal of Obstetrics and Gynaecology Research, 2006; 32(4): 396-402.

Shakibazadeh E, Bayat R, Tahernejad A, Sepehri S. Frequency of, and indications for the first time C-section in Zanjan, Iran. Nursing Practice Today, 2014; 1(4): 207-12.

Briand V, Dumont A, Abrahamowicz M, Sow A, Traore M, Rozenberg P, et al. Maternal and Perinatal Outcomes by Mode of Delivery in Senegal and Mali: A Cross-Sectional Epidemiological Survey. PLOS ONE, 2012; 7(10): e47352.

Nouraei Motlagh S, Asadi-piri Z, Bajoulvand R, Seyed Mohseni F, Bakhtiar K, Birjandi M, et al. Factors Contributing to Iranian Pregnant Women's Tendency to Choice Cesarean Section. Medical Surgical Nursing Journal, 2020; 9(2): e109483.

Leak P, Yamamoto E, Noy P, Keo D, Krang S, Kariya T, et al. Factors associated with neonatal mortality in a tertiary hospital in Phnom Penh, Cambodia. Nagoya journal of medical science, 2021; 83(1): 113-24.

Alimohammadzadeh K, Falahati F, Karami H, Parsa H, Shirvani Shiri M, Erami A, et al. Comparison of Factors Associated with the Neonatal Mortality Rate in Fars Province before and after Implementing the Health Section Evolution: A Retrospective Cross-Sectional Study. Evidence Based Health Policy, Management & Economics, 2021; 5(1): 43-51.

Andegiorgish AK, Andemariam M, Temesghen S, Ogbai L, Ogbe Z, Zeng L. Neonatal mortality and associated factors in the specialized neonatal care unit Asmara, Eritrea. BMC public health, 2020; 20(1): 10.

Gh DA, Zamanian Ghorbani F, Hamzei A, Nazemi S, HM T-i. Comparison of Complications of General and Spinal Anesthesia after Cesarean. The Horizon of Medical Sciences, 2013; 19(3): 123-8.

Iddrisu M, Khan ZH. Anesthesia for cesarean delivery: general or regional anesthesia—a systematic review. Ain-Shams Journal of Anesthesiology, 2021; 13(1): 1.