

Effect of delivery outcome following primary caesarean section on overall caesarean section rate in Libya

Entisar M. A. Emjahed *

Asma Mohamed Yassin Arebi**

Abstract:

The worldwide rise in cesarean section (CS) rates is becoming a major public health concern, and has reached the epidemic level. The aim of this study is to apply the original Robson Ten Group Classification System RTGCS to CS in Tarhuna General Hospital (TGH). This was a descriptive retrospective study, data were collected from the records of 3040 deliveries in the Obstetrics and Gynecology Department at (TGH) during 2016, including patients who had normal vaginal deliveries, and cesarean section deliveries, caesarean data were analyzed using the RTGCS, the contribution of each group to the total caesarean delivery rate, in addition to the contribution of the rate of repeat of CS following previous CS in each group was determined. The rate of CS was 36%, the largest contributor to the overall CS rate was group 5 (58%), The repeat CS for women with a previous one CS comprising (43.5%) of group 5, and this category represents 28% of the overall rate, (40.2%) of previous one CS delivered vaginally, whereas (59.7%) required a repeat CS. The success rate of vaginal birth after a previous CS for each of the following non recurrent indications of primary CS including fetal distress, postdate, prolonged labor, cephalopelvic disproportion, breech presentation, and suspected macrosomia was (37.6%), (50%), (33.3%), (30.1%), (30.7%) and (40%) respectively. Group 5 was found to be the major contributor to the overall CS rates, and a repeat CS after previous one CS make an important contributor in this group.

Keywords: Cesarean delivery, Robson classification of caesarean section, Trial of labor after C/S, Libya.

Introduction:

Cesarean delivery is defined as the birth of a fetus via laparotomy, and then hysterotomy, there are two types of cesarean (CS)

*Tarhuna General Hospital, Tarhuna.

**Tripoli Medical Center and University of Tripoli, Libya.

delivery, primary refers to a first-time hysterotomy and secondary denotes a uterus with one or more prior hysterotomy incisions ⁽¹⁾. The worldwide rise in (CS) rates is becoming a major public health concern, and has reached the epidemic level, and it is a cause of considerable debate due to the potential maternal and perinatal risks, cost issues, and inequity in access ^(2, 3). In the last decade there has been a dramatic increase in the CS rate worldwide, which now exceeds 30% in some regions ⁽⁴⁾. The summarized data of 34 countries have shown that the increase of rates was from 14% of all births in 1990, to nearly 20% in 2000 and 26% in 2009 ⁽⁵⁾. According to recent data, in Middle Africa, only 1.8% of all live birth deliveries occur by CS, compared to 24.3% in North America and 31% in Central America ⁽⁶⁾. However rates vary in different regions, for example Turkey, China and Egypt recorded some of the highest rates of CS (42.7%, 46%, and 51.2%, respectively) ⁽⁶⁾. Reasons for the increase in CS rates in most of the world remain unclear and no agreement has been reached on an appropriate CS rate ^(7 - 9), however, the WHO in 1985 and the US Healthy People 2000 initiative suggested 10 - 15% as the optimal rate ^(10, 11), and as WHO acknowledged in 2009, it is important for patients during delivery to receive the optimal labor interventions, balancing the risks and benefits of each intervention ⁽¹²⁾. The maternal mortality increase compared to vaginal delivery from eight in 100,000 deliveries with the first cesarean delivery to 39 in 100,000 with the fourth cesarean delivery ⁽¹³⁾. In 2001, Michael Robson presented a new classification system, the Robson Ten Group Classification System (RTGCS) ⁽¹⁴⁾. It classifies women into 10 groups and has been recommended for both the monitoring rates over time as well as between facilities by both WHO in 2014 and FIGO in 2016, its categories are mutually exclusive and totally inclusive ^(15, 16). VBAC is one of the strategies developed to control the rising rate of CS. It is a trial of vaginal delivery in selected cases of a previous CS in a well-equipped hospital. ⁽¹⁷⁾ In 1916, the trend concept was, “once a CS, always a CS” ⁽¹⁸⁾. That was the era of the classical CS. In the present era of lower segment CS (LSCS), once a caesarean section, always an institutional delivery in a well-equipped hospital. VBAC success rates ranged from 70 to 87% which are similar to general vaginal birth rates, although this rate varies depending on the clinical situation that led to the first cesarean delivery. Despite this fact, in some European countries, many women who had a previous CS will have a routine CS

subsequently ⁽¹⁹⁾. In spite of the complications related to trial of labor after CS (TOLAC) in pregnant women with previous cesarean section are minimal, they are not ruled out and must, thus, be taken into consideration ⁽²⁰⁾. The aim of this study was to apply the original RTGCS to caesarean sections in Tarhuna General Hospital (TGH), in order to determine the rate of repeat of CS following previous CS, and the contribution of this group to the overall rate in addition to find out the leading indications for these CSs. This would then enable the development of appropriate auditing and targeted interventions to reduce caesarean section rates appropriately.

Methods:

This is a retrospective, descriptive case series study, and data were collected from records of all patients in the Obstetrics and Gynecology Department at Tarhuna General Hospital TGH during the year 2016, normal vaginal deliveries were (n = 1945 deliveries) and cesarean section deliveries were (n = 1095 deliveries), the caesarean section deliveries included 430 women with a previous one cesarean section. Most of the decisions for emergency CS at the study site were made, and the procedures were carried out by Senior House Officers (SHO). Specialist Obstetricians performed or supervised those CSs that were expected to be surgically difficult. Fetal heart rate monitoring was carried out by intermittent fetal cardio-tocography, and the gestational age was determined by the mother's last menstrual period, and confirmed by first trimester ultrasound scan when necessary. Caesarean data were analyzed using the RTGCS with reference to overall caesarean delivery rate, the contribution of each group to the total caesarean delivery rate, in addition to the contribution of the rate of repeat of CS following previous CS in each group.

The variables necessary for applying the Robson classification are: number of fetuses, fetal, previous obstetric record, onset of labor and delivery, and gestational age at the time of delivery. We classified women into the 10 groups described by Robson (Table 1) ⁽¹⁴⁾.

Other variables investigated were obstetric characteristics of women with a previous one CS as parity, gestational age at delivery, the indications of primary CS, the outcome of delivery (type of delivery) weather vaginal delivery or CS, and if delivered by cesarean section, the indication for the procedure as documented by the physician in the medical record. The indications of CS (primary or repeat CS) were divided into 2 categories:

Table 1: Robson Ten Group Classification System (RTGCS) ⁽¹⁴⁾

Group	Description
1	Nulliparous women with a single cephalic pregnancy, at greater than or equal to 37 weeks gestation in spontaneous labour
2	Nulliparous women with a single cephalic pregnancy, at greater than or equal to 37 weeks gestation who either had labour induced, or were delivered by a caesarean section before labour
3	Multiparous women, without a previous uterine scar, with a single cephalic pregnancy at greater than or equal to 37 weeks in spontaneous labour
4	Multiparous women, without a previous uterine scar, with a single cephalic pregnancy at greater than or equal to 37 weeks who either had labour induced or were delivered by a caesarean section
5	All multiparous women, with at least one previous uterine scar and a single cephalic pregnancy at greater than or equal to 37 weeks gestation
6	All nulliparous women with a single breech pregnancy
7	All multiparous women with a single breech pregnancy including, women with previous uterine scars
8	All women with multiple pregnancies, including women with previous uterine scars
9	All women with a single pregnancy with a transverse or oblique lie, including women with previous uterine scars
10	All women with a single cephalic pregnancy at less than or equal to 36 weeks gestation, including women with previous scars.

Maternal indications:

Including, placental abruption, oligohydramnios, prolonged labour "dystocia", hypertensive disorders such as preeclampsia, eclampsia and gestational hypertension, placenta Previa, senior primigravida, diabetes mellitus, prolonged prelabour rupture of

membranes (PLROM), cephalopelvic disproportion or other maternal pathologies.

Fetal indications:

ncluding, fetal distress, malpresentation "breech, face presentation, transverse lie and unstable lie", precious baby, in case of infertility or bad obstetric history, suspected macrosomia, multiple gestation, failed induction of labour (IOL), postdate date, intrauterine fetal death (IUFD), fetal congenital anomalies and cord prolapse.

In addition to CS on maternal request or for unknown indication. Rates for each indication were calculated as the number of cesareans performed for each indication divided by the total number of women with a previous one CS for both primary and repeat CS. VBAC rate were calculated and defined as successful VBAC divided by the number of women who underwent previous cesarean delivery. The success rate of vaginal birth after a previous CS for each indication was calculated.

Data were extracted from medical records cross checked with the birth suite register to ensure that no CSs were missed.

Statistical analysis:

Data were processed using the Statistical Program for Social Sciences (SPSS version.22.0) for windows that is used for data entry and analysis. Descriptive statistics were used and all results are presented as frequencies and percentages. Categorical data were compared using the Chi-square test.

Results:

During the study period there were 3040 deliveries. The total number of CSs was 1095, giving an overall caesarean section rate of 36%. Table 1 shows RTGCs of all patients who had CSs and the percentage contribution of each group to the overall CS rate, and the contribution of repeat CS for women with a previous one CS in each group. The largest contributor to the overall CS rate was women with previous CS (group 5) 58% of the overall 36%.

Groups 1, 2, 3, 4, 6, 7, 8, 9 and 10 contributed to 12.7%, 9.5%, 4.7% 12.7%, 9.5%, 4.7%, 2.4%, 3.4%, 1.1%, 1.2% and 0.02% of the CS, respectively.

Table 1: RTGC and percentage contribution of each group to the overall CS rate, and contribution of repeat CS for women with a previous one CS in each group>

No	Groups	Contribution made by each group to the overall CS rate No (%)	Contribution of repeat CS for women with a previous I CS in each group No (%)
1	Nulliparous, single cephalic, > 37 weeks in spontaneous labor	139 (12.7%)	-----
2	Nulliparous, single cephalic, > 37 weeks, induced or CS before	104 (9.5%)	-----
3	Multiparous (excluding previous CS), single cephalic, > 37 weeks in spontaneous labor	52 (4.7%)	-----
4	Multiparous (excluding previous CS), single cephalic, > 37 weeks, induced or CS before	64 (5.8%)	-----
5	Previous CS, single cephalic, > 37 weeks	640 (58%)	279(43.5%)
6	All nulliparous breeches	26 (2.4%)	-----
7	All multiparous breeches (including previous CS)	37 (3.4%)	18(48.6%)
8	All multiple pregnancies (including previous CS)	19(1.7%)	6(31.5%)
9	All abnormal lies (including previous CS)	12(1.1%)	1(0.08%)
10	All single cephalic, < 36 weeks (including previous CS)	2(0.2%)	2(100%)
		1059(36%)	306(28.8%)

Figure 1 shows that the repeat CS for women with a previous one CS in the groups included previous CS of RTGCS groups (5, 7, 8, 9 and 10) represents 28% of the overall rate, 270 out of 640 women who had had one previous CS in group 5 comprising (43.5%) which is one of the largest rates of repeat CS within these groups.

Figure 1: Contribution of repeat CS for women with a previous one CS in each group of RTGCS.

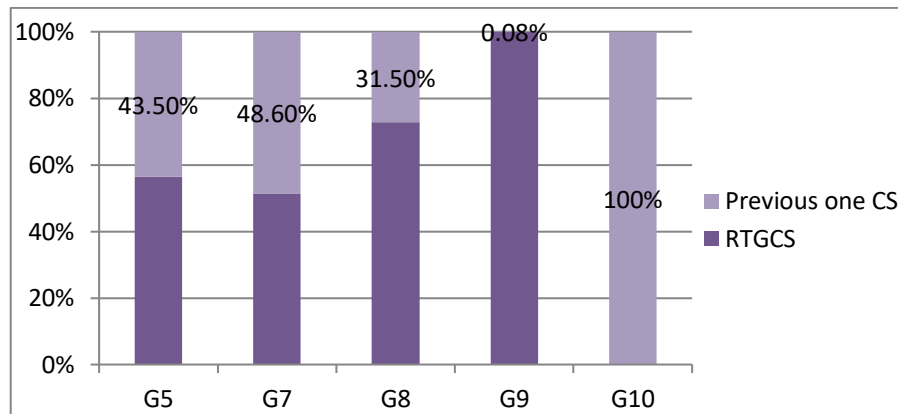


Table (2) shows that during the study period 430 women with a previous CS were admitted to Tarhuna General Hospital (TGH), 173 (40.2%) of previous CSs cases were delivered vaginally, whereas 59.7% required a repeat CS. The majority of these CSs were elective ($n = 134$, 31.1%), and emergency CSs were performed for ($n = 123$, 28.6%), although most of them were qualified for vaginal birth after their previous CS, however they declined.

Table 2: The mode of delivery following a previous CS

Mode of delivery	Frequency	(%)
Normal vaginal delivery	173	(40.2%)
Elective CS	134	(31.1%)
Emergency CS	123	(28.6%)
Total	430	(100%)

Table 3 shows that the success rate of vaginal birth after a previous CS for each of the following non recurrent indication of primary CS, was as following, fetal distress (37.6%), postdated pregnancy (50%), prolonged labor (33.3%), cephalopelvic disproportion (30.1%), twins (56.2%), breech (30.7%), suspected macrosomia (40%) and abruption of placenta (45.5%). These rates are

encouraging and increase the chance of vaginal delivery success for women with previous CS (VBAC).

Table 4 shows that through this study It was further observed that women with a previous vaginal delivery had a better chance of a successful VBAC as compared to women who did not have a previous vaginal delivery, and this rate increases by increasing the parity whereas the success rate of VBAC for para 1 is (13.6%), para 2 (40.5%), para 3 (59.4%), para 4 (57.1%), para 5 (63.1%), para 6 (45.4%) and para 7 (62.5%).

Table 3: The relationship between the indications of primary CS and the delivery outcome of present pregnancy.

Indications	Frequency	NVD	Caesarean section	
			Elective	Emergency
FD*	117	44(37.6%)	29(24.7%)	44(37.6%)
CPD**	67	19(30.1%)	20(31.7%)	24(38%)
Unknown	63	3(4.4%)	48(71.6%)	16(23.8%)
Breech	39	12(30.7%)	14(35.8%)	13(33.3%)
Hypertensive disorders	20	8(40%)	8(40%)	4(20%)
Twins	16	9(56.2%)	1(6.2%)	6(37.5%)
Precious baby	14	1(7%)	9(64.2%)	4(28.5%)
Prolonged labour	12	4(33.3%)	3(25%)	5(41.6%)
Oligohydramnios	12	2(16.6%)	7(58.3%)	3(25%)
Abruption of placenta	11	5(45.5%)	4(36.3%)	2(18%)
Suspected macrosomia	10	4(40%)	4(40%)	2(20%)
Elderly primigravida	9	1(11%)	6(66.6%)	2(22.2%)
Postdate	6	3(50%)	2(33.3%)	1(16.6%)
Transverse lie	6	2(33.3%)	3(50%)	1(16.6%)
Placenta previa	4	3(75%)	0	1(25%)
Fetal congenital anomalies	4	1(25%)	2(50%)	1(25%)
Failed IOL***	3	0(0%)	3(100%)	0(0%)
Other indication	17	1(5%)	10(58.8%)	6(35.2%)
Total	430	173	134	123

FD* = Fetal stress CPD** = Cephalopelvic disproportion, IOL*** = Induction of labor and NVD = Normal vaginal delivery

Table 4: The relationship between the parity and the success rate of vaginal birth of CS

Parity	The rate of VBAC
Para 1	13.6%
Para 2	40.5%
Para 3	59.4%
Para 4	57.1%
Para 5	63.1%
Para 6	45.4%
Para 7	62.5%

Table 5 shows that the most common indications for repeat CS were, cephalopelvic disproportion (11.61%), fetal distress (12.7%), elective repeat of CS (9%), placenta previa (8%), less than one year interval since the previous CS (7%), prolonged labor (6%), breech (5.5%) and precious baby (4.8%). However, the least common indications were abruption of placenta (2.8%), senior primigravida (2.6%), twins (1.9%), suspected macrosomia (1.9%), oligohydramnios (1.6%) and history of instrumental delivery.

Table 5: The main indications of repeat CS

Indications	Frequency	(%)
CPD*	48	15.6%
FD**	39	12.7%
El. Repeat of CS	28	9%
Post date	25	8%
< 1 yr. since previous CS	24	7%
Prolonged labor (dystocia)	19	6%
Breech	17	5.5%
Precious baby	15	4.8%
Abruption of placenta	9	2.9%
Tender scar	9	2.9%
Elderly primigravida	8	2.6%
Twins	6	1.9%
Suspected macrosomia	6	1.9%
Oligohydramnios	5	1.6%
H/O instrumental delivery	4	1.3%
Unknown	3	0.9%
< 2 yr. since previous CS	3	0.9%
Other indications	18	5.8%
Total	307	100

CPD* = Cephalopelvic disproportion,

FD** = Fetal distress and

Discussion:

This study showed that the caesarean section overall rate in TGH through the period of study is 36%, This is almost more than two times higher than the 15% recommended rate by the WHO ^(21, 22). As RTGCS used to find out which groups that most contribute to CS, the current analysis of CS data revealed that (group 5) contributed to nearly half (58%) of the overall CS rate, which is the single most contributing to CS in TGH. This is consistent with Suliman et al. who reported that groups 1, 3 and 5 were the major contributors to CS accounting for 67.9% of the overall CSs ⁽²³⁾, as well as with Nakamura-Pereira et al. ⁽²⁴⁾ observation which showed that group 5 is responsible for almost a third of CS carried out in Brazil. In the Robson et al. classification for CS, Group 5 makes the largest contribution to the overall CS rates ⁽²⁵⁾. Recently, WHO analysis found that CS rate and the absolute contribution of group 5 has increased in recent years ⁽²⁶⁾.

El. = Elective

There is a clear evidence from this finding that trial of labour after caesarean section (TOLAC) is the only remedy to decrease (group 5) contribution to CS rates, however these patients belong to a high-risk group due to the risk of a scar rupture. Even though vaginal birth after one CS has been advocated as a safe option, the number of women who attempt VBAC has declined over recent years due to fear of uterine rupture, which can cause serious harm to the pregnant woman as well as the baby. Based on this background, and result, it is important to concentrate on data of women with previous one CS. We found out that only 40% of women who qualified for vaginal birth after CS (VBAC) ended up having a successful VBAC and this result was lower than the results of other studies reported by Allahabadia ⁽²⁷⁾ and Sullivan ⁽²⁸⁾, while the 60% of them who had a repeat CS contributed to 28.8% of overall CS rate and (43.5%, 48.6%, 31.5%, 0.08% and 100%) in RTGCS groups (group 5, 7, 8, 9 and 10 respectively), reinforcing the saying “once a cesarean, always a cesarean.”

In the present study, the rate of successful VBAC in cases with previous normal vaginal delivery was ranging from 13% to 63.1% which increases by increasing the parity. Landon et al. ⁽²⁹⁾ and Bedoya et al. ⁽³⁰⁾ reported that a previous vaginal delivery was the greatest predictor for a successful VBAC. In the present study, the commonest indication for a previous CS was fetal distress. The success rate of VBAC in these cases was 37.6%. Less than the results that have been reported by other workers (68 to 83%) ⁽³¹⁾. The Robson classification identifies the contributors to the CS rate, but does not provide insight into the reasons or explanation for the observed differences ⁽³²⁾, hence there is need to further analysis of repeat CS indications and find out the leading ones. One of the largest contributor to the increasing repeat cesarean delivery rate was fetal distress (12.7%), as health service providers may be more apt to proceed with cesarean delivery for questionable tracings in the recent medico-legal climate ⁽³³⁾. Cesarean delivery for vertex presenting twins, also contributed to the rise in CS rates ⁽³⁴⁾ maternal request has recently contribute to (9%) of the repeat CS rate, as well as failure to progress ⁽³⁵⁾.

Analyzing the increase in the number of CSs in the period between the two WHO surveys, Vogel et al. ⁽²⁶⁾ concluded that the threshold for medically indicated CS has become lower over time, so the increase in overall CS rate lead to unnecessary harm to women's and newborn's health if performed without indication. The only limitation is that data represents one institution and thus may not be generalizable to populations with different demographic and regional characteristics. However, because our data represents one institution, the number of births in the cohort is lower than many other studies. From the Robson classification of caesarean sections in TGH, (group 5) was found to be the major contributor to the overall caesarean section rates, and a repeat CS after previous one CS make an important contributor in this group, and the only group amenable to reduce and implementing a strategy to decrease primary CS rates is the key to reducing the number of previous CS. TOLAC should be offered as per protocols

and not left only to individual obstetrician discretion to increase the rate of successful VBAC.

Given the fact that fetal distress, prolonged labor and CPD were the major indications for repeat CS, close attention needs to be given to these factors, possibly ensuring strict criteria for CS and including training on interpretation of fetal cardiotocographic recordings and standardizing them, and proper use and interpretation of partograms. Set up dedicated VBAC clinics to assist women, counselling and giving them information about the risk associated with a repeat CS, to make an informed choice with use of decision aids may lead to an increase in the number of women electing to have a VBAC so many CSs can be avoided and subsequent medico-legal litigations. Women expressing intense fear of childbirth, or a strong desire for CS, are referred to special 'fear clinics' at these clinics, the woman can discuss issues around the previous and future births. Additionally, the women can be referred to an obstetrician or a psychologist if needed.

تأثير نتائج الولادة بالعملية القيصرية الأولية على معدل العمليات القيصرية

انتصار محمد امجاهد *

أسماء محمد ياسين عريبي **

المستخلص:

أصبح ارتفاع معدلات الولادة القيصرية في جميع أنحاء العالم مصدرا رئيسيا للقلق في مجال الصحة العامة، ووصل إلى مستوى الوباء وعلى ضوء هذه الخلفية، كان الهدف من هذه الدراسة تطبيق نظام المجموعات العشرة الأصلي لروبسون على العمليات القيصرية في مستشفى ترهونة العام في الفترة مابين 1 يناير 2016 حتى 31 ديسمبر 2016، من أجل تحديد معدل تكرار العمليات القيصرية بعد عملية قيصرية في السابق وقد استنتجت الدراسة من خلال تصنيف روبسون للعمليات القيصرية أن (المجموعة 5) هي المساهم الرئيسي في المعدل العام للعمليات القيصرية، ويشكل تكرار العمليات القيصرية بعد عملية قيصرية واحدة المساهم الأهم في هذه المجموعة وهي المجموعة الوحيدة التي يمكن تقليلها، حيث إن العوامل القابلة للتعديل وإعادة النظر في

* مستشفى ترهونة العام .

** مركز طرابلس الطبي .

خفض معدلات الولادة القيصرية ستكون استراتيجية لخفض معدلات الولادة القيصرية الأولية و التي هي المفتاح الرئيسي للحد من عدد العمليات القيصرية السابقة.

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