ORIGINAL ARTICLE

Analysis of Caesarean Section Rate using the 10 Group Robson Classification in Zagazig University Hospital.

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ABSTRACT

Background: Increase rate of unnecessary caesarean sections has been a growing concern in the world. WHO proposed the Robson classification system as a global standard for assessing, monitoring and comparing caesarean section rates within healthcare facilities overtime and between facilities. **Aim**: To assess and analyze Cesarean Section Rate (CSR) of Zagazig university hospital over the period of six months using the 10 Group Robson classification system.

Patients & methods: A prospective cross-sectional study was carried out in the Department of Obstetrics & Gynecology at Zagazig University Hospitals, Zagazig, Sharkia, Egypt, from January 2019 till June 2019. All women admitted for delivery were classified using Robson classification.

Results: 2333 women were admitted for delivery. 854 (36.6%) gave birth by vaginal delivery while 1479(63.4%) by CS. Robson Group 5 (multiparous, term, cephalic and previous cesarean section) contributed the most to the overall CS rate (53.2 % relative contribution). Group 10(cephalic preterm pregnancies) and group 2 (nulliparous , single , term , cephalic pre labor) were the second and third greatest contributors towards the overall CS rate , with 10.2% and 8.9 % respectively.

Conclusion: Robson Groups 5, 10, and 2 were identified as the main contributors to the overall CS rate at our hospital. Robson classification can be incorporated successfully into the routine maternal and perinatal data collection system to improve the monitoring and evaluation of caesarean section rate.

Keywords: Cesarean; Robson; Zagazig.

INTRODUCTION

CS is the commonest and most important major operation performed on women worldwide . It is indicated when vaginal delivery might carry a risk to the mother (mainly labor dystocia and previous cesarean) or to the fetus (mainly fetal distress and malpresentations) or both[1,2]**.**

WHO estimates the rate of cesarean section to be between 10-15% of all births in developed countries. Nevertheless, the cesarean section rate in the UK was about 25% and in USA it was about 32.1% in 2017. This increase in rate is partly due to reasons other than medical necessity e.g., CS on maternal request [3.]

Egypt has the highest rate of Caesarean section of 54 % in the Eastern Mediterranean Region, with no furthermore improvement to maternal and child mortality rates [4].

Determining the adequate Caesarean Sections rate at the population level is a challenging task due to intrinsic differences in hospital factors and infrastructure (primary versus tertiary level) , difference in characteristics of obstetric population and difference in management protocol[5] .

Health organizations have suggested the need for a classification system that can best monitor and compare CS rates in a standardized , reliable , consistent and action oriented manner .WHO proposed the Robson classification system as a global standard for assessing , monitoring and comparing caesarean section rates within healthcare facilities overtime and between facilities .It classifies women in 10 groups based on their obstetric characteristics(parity , previous CS , gestational age , onset of labor , fetal presentation , and number of fetuses) without needing the indication of CS[6] . It gives a good

opportunity to evaluate the prevalence of CSs among various groups of women , to compare data between institutions , learn from each other .So, a better critical assessment can be provided to change the practice and create strategies for better results through audit and feedback cycle [7] .

PATIENTS AND METHODS

This prospective cross sectional study was carried out in the Department of Obstetrics & Gynecology at Zagazig University Hospitals, Zagazig, Sharkia, Egypt, from 1st of January 2019 till 30 of June 2019. The study population included all women who delivered and attended at Zagazig University hospital with live births or stillbirths of at least 500-gram birth weight or at least 28 weeks gestation for the six months . 2333 women were included. All women delivering less than 28-week gestation were excluded. All target population was subjected to : Full history taking including personal, present, past, family, contraceptive and menstrual history and obstetric history that include (parity , previous CS , gestational age , onset of labor , fetal presentation , and number of fetuses) , general examination , abdominal examination , obstetric U/S , recording the events of labor and its complications if present , neonatal resuscitation by neonatologist and assessment of the APGAR score at 1 and 5 minute to diagnose the occurrence of RDS in the neonates of both groups and classification of the women who give birth using the 10 Group Robson classification as follows:

Group (1) include nulliparous women with a single cephalic pregnancy, ≥37 weeks gestation in spontaneous labour

Group (2) include all nulliparous women with a single cephalic pregnancy, ≥37 weeks gestation who had labour induced or were delivered by CS before labour 2a Labour induced 2b Pre-labour CS Group (3) include multiparous women without a previous CS, with a single cephalic pregnancy, ≥37 weeks gestation in spontaneous labour Group (4) include multiparous women without a previous CS, with a single cephalic pregnancy, ≥37 weeks gestation who had labour induced or were delivered by CS before labour 4a Labour induced

4b Pre-labour CS Group (5) include all multiparous women with at least one previous CS, with a single cephalic pregnancy, ≥37 weeks gestation

Group (6) include all nulliparous women with a single breech pregnancy

Group (7) include all multiparous women with a single breech pregnancy including women with previous CS(s)

Group (8) include all women with multiple pregnancies including women with previous CS(s) Group (9) include all women with a single pregnancy with a transverse or oblique lie, including women with previous CS(s)

Group (10) include all women with a single cephalic pregnancy < 37 weeks gestation, including women with previous CS(s)

as shown in table (1)

Using these variables, women were placed into one of the 10 groups as shown in figure (1)

The study was approved by the research ethical committee of Faculty of Medicine, Zagazig University. The work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

Statistical analysis: All data were collected, tabulated and statistically analyzed using The EpiData V.3.1 software . Quantitative data were expressed as mean ± SD while qualitative data were expressed as numbers and percentages (%)..

RESULTS

2333 women were admitted for delivery and classified using Robson classification. 854 (36.6 %) had vaginal delivery and 1479 (63.4 %) had CS. Group 5 has the largest group size(33.9%) and is the largest relative contributor for overall CSR (33.7%). Group 6 and 9 have a 100% group CSR. as shown in table (3)

275 women received induction of labor ; 119 women (43.2%) had CS as shown in table (4)

Previous CS was the most common indication 940 women out of 1479(63.5 %) of performing CS, followed by fetal distress 180 women out of 1479 (12.1%) as shown in table (5).

Table no. (1): Robson groups characteristics.

Groups	Clinical characteristics
1	Nulliparous, singleton, cephalic, ≥37 weeks, spontaneous labor
2	Nulliparous, singleton, cephalic, ≥37 weeks, induced labor or cesarean section before labor
3	Multiparous without previous cesarean section, singleton, cephalic, ≥37 weeks, spontaneous labor
4	Multiparous without previous cesarean section, singleton, cephalic, ≥37 weeks, induced labor or caesarean section before labor
5	Multiparous with prior cesarean section, singleton, cephalic, ≥37 weeks
6	All nulliparous breeches
7	All multiparous breeches (including previous cesarean section)
8	All multiple pregnancies (including previous cesarean section)
9	All pregnancies with transverse or oblique lie (including those previous cesarean section)
10	Singleton, cephalic, ≤36 weeks (including previous cesarean section)

Table 2: the sociodemographic data of the studied poulation

	Number
Age (years):	
Mean ± SD	25 ± 3.4 years
Range	15- 39 years
Years of education:	
Un-educated	3
1 – 6 years	14
7 – 9 years	52
10 – 12 years	1656 (70.9 %)
More than 12 years	608 (26%)
Employment state:	
Un-employed	1794 (77%)
Employee	539 (23%)

The mean age was : 25 years

77 % of cases were un-employed

Table 3: Robson table for Zagazig university hospital

Group No.	Tot. No. of CS in each group	Tot. No. of VD in each group	Tot. No. delivered in the group	Group size	Group CSR	Absolute group contribution to overall CS rate	Relative group contribution to overall CSR
1	53	203	256	10.90%	20.70%	2.20%	3.50%
2	132	69	201	8.60%	65.60%	5.60%	8.90%
3	42	329	371	15.90%	11.30%	2%	2.80%
4	126	87	213	9.10%	59.10%	5.40%	8.50%

Group No.	Tot. No. of CS in each group	Tot. No. of VD in each group	Tot. No. delivered in the group	Group size	Group CSR	Absolute group contribution to overall CS rate	Relative group contribution to overall CSR
5	787	5	792	33.90%	99.30%	33.70%	53.20%
6	54	Zero	54	2.30%	100%	2.30%	3.60%
7	63	3	66	3%	95.40%	2.70%	4.20%
8	58	51	109	4.70%	53%	2.40%	3.90%
9	12	Zero	12	0.50%	100%	0.50%	0.80%
10	152	107	259	11.10%	58.60%	6.50%	10.20%

Group size (%) = N. of women in the group/total N. women delivered in the hospital × 100.
Group CS rate (%) = N. of CS in the group/total N. of women in the group × 100.
Absolute contribution (%) = N. of CS in the group/total N. of women delivered in the hospital × 100.
Relative contribution (%) = N. of CS in the group/total N. of CS in the hospital × 100.
CSR (caesarean section rate).
Group 5 has the largest group size(33.9%) and is the largest relative contributor for overall CSR (33.7%)
Group 6 and 9 have a 100% group CSR

Table 4: women who were given induction of labor

Group	Vaginal delivery	Cesarean section	Total
2. a	69	55	124
4. a	87	64	151

275 women received induction of labor ; 119 women (43.2%) had CS

Table 5 : most common Indications of CS

Indication of CS	Number
Accidental hemorrhage	4
Breech	146
Cord prolapse	5
CPD	90
Eclampsia	7
Elderly PG	5
Fetal distress	180
HPV	3
Pelvic repair	1
Maternal request	16
CFMF	7
Severe PET	6
IUGR	12
Macrosomia	28
Previous CS	940
Precious baby	23
Triplet	1
Cardiac (A.S.)	1

Previous CS is the most common indication 940 women out of 1479(63.5 %) of performing CS, followed by fetal distress 180 women out of 1479 (12.1%)
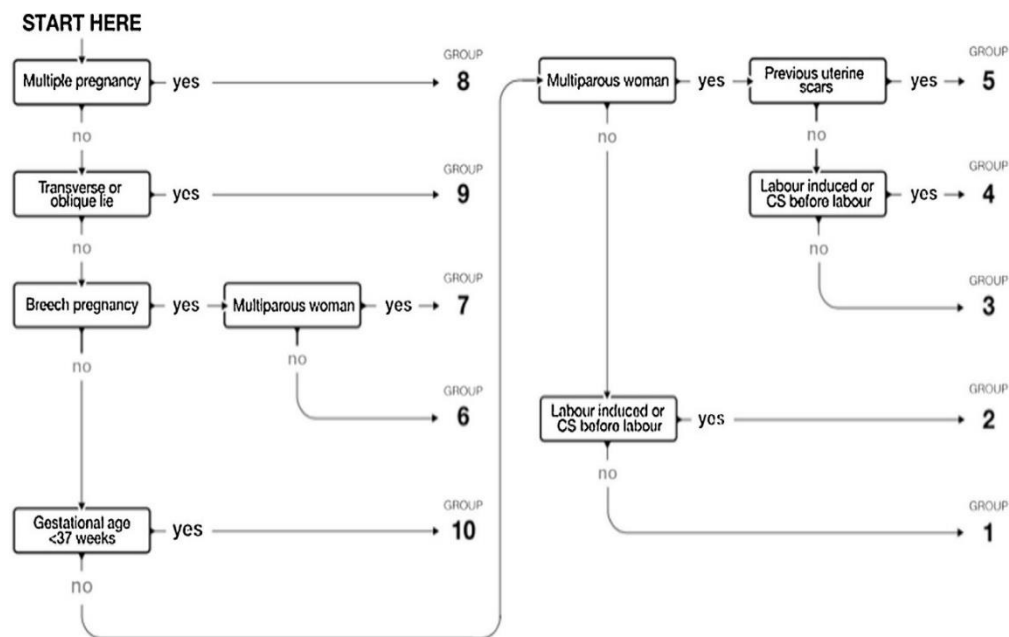
figure 1: flow chart for classification of women using Robson classification

DISCUSSION

The study was designed as a prospective cross sectional study at Zagazig university hospital. The mean age was : 25 years± 3.4 years .77% of cases were unemployed as shown in table (2). Women classified into Group 5 (all multiparous women with at least one CS with a single cephalic pregnancy, ≥ 37 weeks gestation) made the greatest contribution to the overall CS rate (53.2 % relative contribution). On further analysis, 33% (263/787) of women had one previous CS and 67% (524/787) had a history of previous two or more CS. Among those women who had previous history of only one CS in Group 5 ; 99 women were presented in spontaneous labour and 75 of them had cervical dilatation of 2–5 cm on admission. Women belonging to Group 5 are increasingly important determinant of overall CSR .Those presented with spontaneous labor were managed as an emergency CS even if they had only one previous CS and were eligible for trial of labor. Tanaka and Mahomed 2017[8] found that the family pressure and existing culture of "once a CS is always a CS" among the studied population played a major role in women not opting for vaginal birth after cesarean section (VBAC). Possible explanations for the lack of trial of labor include a lack of information concerning previous caesarean section among women referred to our hospital . In addition, it is possible that clinicians' fear of litigation and lack of availability of resources necessary for the safe trial of labor, for example continuous EFM (electronic fetal monitoring) during labor, and availability of one to one care are the factors identified for the high CS rate in this group. Zhang

et al ., 2016[9] found that countries like, France and Netherland and Brazil with better socioeconomic status have also reported higher contribution from this group i.e., 61% and 47% and 30.8% respectively towards overall CS rate. In our study only 5 women out of 792 from group 5 had VBAC . Cases were admitted in labor with fully dilated cervix that was no time for performing a CS . The role of midwives in reducing over medicalization of labor and addressing women's concerns in this respect should be well established. A well connected midwifery system allowing them to conduct normal vaginal deliveries will reduce the workload for obstetricians, as many obstetricians in Egypt do not offer VBAC due to their busy schedule.Clinicians and researchers have observed increases in the incidence of abnormal placentation (placenta accrete and percreta), and hemorrhage leading to higher maternal and neonatal mortality. The risk of abnormal placentation is 40% with one CS, and 60% with more than one CS. The effects of such complications are further intensified in low-income settings, due to their increase fertility rate, lack of essential obstetric interventions and limited resources. During the period of study the incidence of hysterectomy was 41 cases, 40 of them had previous CS with placenta previa accreta . Among those 40 , one mortality case due to massive bleeding.

The second highest contributors were Women in Group 10 (women with single cephalic pregnancy <37 weeks gestation, including women with previous CS) , (10.2% relative contribution) to the overall CS rate. Although preterm birth is the

main determinant of neonatal morbidity and mortality, prematurity itself with no other risk factors is not an absolute indication for CS.

Women in group 2 (nulliparous with single , term ,cephalic either induced or planned CS)made the 3rd largest contribution (8.9 % relative contribution to the overall CS rate) .Among those women 41.6 % (55/132)(group 2a) were given induction of labor by prostaglandin , while 58.4 % (77/132)(group 2b) had a planned CS.

Women in group 4 (multiparous with single , term ,cephalic either induced or planned CS)made the 4th largest contribution (8.5 % relative contribution to the overall CS rate) .Among those women 50.7 % (64/126)(group 4a) were given induction of labor by prostaglandin , while 49.3% (62/126) (group 4b) had a planned CS.

Group 2 , the 3rd largest contributor has a high group CS rate 65.6% . The common indications of CS in this group include precious baby and women with unfavourable cervix and CS on maternal request 8% (16/201) . The induction of labour without proper assessment can increase the risk of having an unnecessary caesarean section . Among 275 cases who received induction in group 2 and 4 , 119 (43.3%) women developed fetal distress and ended by performing CS. Fetal distress is the 2nd highest indication of CS .

Electronic fetal monitoring , Unfortunately, despite initial optimism, Its use increases the cesarean delivery rate .It has become well established that management based on electronic monitoring is no better in reducing the risk of cerebral palsy or perinatal death than that based on intermittent heart rate auscultation.

Women in group 7 made a relative contribution of CS rate by 4.2% . Although breech presentation is not the most common indication of CS, it may be the most preventable one. The timely diagnosis of breech presentation by offering third-trimester scan at 36 weeks to all women suspected to have a breech presentation and an attempt at external cephalic version (ECV) after 36 weeks for those suitable for intervention has been shown to safely reduce the need for CS. External cephalic version is not tried at our facility. Women with breech presentation do not receive any other management option apart from elective caesarean section. Although setting up an ECV clinic and training doctors will incur additional cost and resources, it could provide women with options and reduce the CS rate in the long run .

Group 8 (all women with multiple pregnancy including women with scarred uterus)comes the 6th contributor by relative contribution rate 3.9 %.Then group 6 (nulliparous with single breech pregnancy) by relative contribution rate 3.6 %

then group 1(nulliparous , single, term ,cephalic pregnancy with spontaneous labor) by relative contribution rate 3.5 % then group 3 (multiparous, single ,term ,cephalic pregnancy with spontaneous labor) by relative contribution rate 2.8 % and lastly group 9 (all women with a single oblique or transverse pregnancy including women with a scarred uterus) by relative contribution rate 0.8 % .

CONCLUSION

In our study, Robson Groups 5, 10, and 2 were identified as the main contributors to the overall CS rate at our university hospital. the most common indication of performing Cesarean Section was previous CS. Group 5 was the largest contributor for CS by absolute group contribution 33.7 % and relative group contribution 53.2 %. We believe that Robson classification can be incorporated successfully into the routine maternal and perinatal data collection system to improve the monitoring and evaluation of caesarean section rate.

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