



ANALYSIS OF CAESAREAN SECTION AND IT'S INDICATIONS IN A TERTIARY CARE CENTRE

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ABSTRACT

Introduction: A caesarean section can significantly reduce maternal and perinatal mortality, when medically indicated⁽⁴⁾. However, unnecessary caesarean sections have no benefit. Instead, they are associated with short and long-term complications which can be detrimental to the health of the mother, her child as well as future pregnancies⁽¹⁾⁽⁵⁾. According to the WHO, at a population level, caesarean section rates higher than 10% do not show any reduction in maternal and newborn mortality⁽¹⁾

Objective: To classify all the caesarean section deliveries in the sample based on the Robson's Ten Group Classification as well as based on their indications and to correlate the two.

Methods: A retrospective type of study was carried out in a total of 300 pregnant women who had undergone a caesarean section delivery using a structured questionnaire and the deliveries were classified under the Robson's classification.

Results: The results of our study showed that Robson's Group 5 made the highest contribution of 35% (105 out of 300 cases) to the total number of caesarean sections. Out of the 300 caesarean section procedures performed in our study group, 188 (62.67%) were emergency, 87 (29%) were elective and 25 (8.33%) were not indicated. Overall, the highest contributing indication was found to be fetal distress which made a contribution of 20% (60 out of 300 cases). The most important cause for unindicated sections was maternal wish which made a contribution of 7% to the total number of caesarean sections.

Conclusions And Relevance: The study showed that the Robson's classification was an effective tool to analyse caesarean section deliveries. We also found that 8.33% of the sections were medically not indicated, out of which 7% were due to maternal wish. These cases should be targeted, especially those belonging to Group 5 as it is the highest contributing group, so as to reduce medically unnecessary caesarean sections. All women with a single previous caesarean section delivery should be evaluated for trial of labour after caesarean section (TOLAC) so as to achieve the goal of vaginal birth after caesarean section (VBAC) in these patients.

KEYWORDS

INTRODUCTION:

The caesarean section is one of the most commonly performed surgical procedures in an obstetric and gynaecological setting. The World Health Organisation states that the ideal caesarean section rate in a region should be between 10 to 15%⁽¹⁾⁽²⁾. Over the last few years caesarean section rates have been increasing and this has been a cause for concern⁽³⁾. A caesarean section can significantly reduce maternal and perinatal mortality, when medically indicated⁽⁴⁾. However, unnecessary caesarean sections have no benefit. Instead, they are associated with short and long-term complications which can be detrimental to the health of the mother, her child as well as future pregnancies⁽¹⁾⁽⁵⁾. According to the WHO, at a population level, caesarean section rates higher than 10% do not show any reduction in maternal and newborn mortality⁽¹⁾. Unnecessary caesarean sections are also a significant expense. They are a financial drain on our country's resources and hence they can be a significant public health problem⁽⁶⁾.

This project analyses the caesarean sections taking place at a tertiary care centre using the Robson's Ten Group Classification System⁽¹⁾⁽⁷⁻¹⁵⁾. At the moment, there is no standard classification system that can be used to compare and analyse caesarean section deliveries across hospitals, cities and countries. The WHO recommends the Robson's classification as the most appropriate for classifying and analysing caesarean sections in healthcare facilities⁽¹⁾⁽⁷⁾.

Objectives:

1. To classify every caesarean section in the sample under the Robson's Ten Group Classification system and to find the percentage contribution of each group to the total number of caesarean sections.
2. To analyse the above findings and identify which groups contribute the most to the total number of caesarean sections.
3. To analyse all caesarean sections based on their indications, find the most common indications leading to a section and to correlate the groups under the Robson's classification with the indications of the caesarean section.

MATERIALS AND METHODS:

Type of study: A retrospective type of study was carried out in pregnant women who have undergone a caesarean section delivery in a tertiary care centre. This study was carried out after approval from the institutional ethics committee in line with ethical norms and was

undertaken as per guidelines issued by the ethics committee.

Sample Size: The study includes a total of 300 women who have undergone a caesarean section delivery in a tertiary care centre.

The information required for classification under the Robson's ten group classification as well as regarding the indications of the caesarean sections was collected from medical records of all the study subjects using a formulated study questionnaire. (The questionnaire used has been given later on page no. 28)

Inclusion Criteria :

All pregnant women who have undergone caesarean section delivery in a tertiary care centre.

The caesarean section has been defined as the operative procedure whereby the fetuses after the end of 28th week of gestation are delivered through an incision on the abdominal and uterine walls⁽¹⁴⁾.

Exclusion Criteria :

1. Women who have undergone a vaginal delivery.
2. Women who are not pregnant.

The information collected was then used to classify all women in the study under the Robson's Ten group classification. The classification is as follows:

Table 1: The Robson's Classification

Group	Description
1	Nulliparous women with a single cephalic pregnancy, ≥ 37 weeks gestation in spontaneous labour
2	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
3	Multiparous women without a previous CS, with a single cephalic pregnancy, ≥ 37 weeks gestation in spontaneous labour
4	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
5	All multiparous women with at least one previous CS, with a single cephalic pregnancy, ≥ 37 weeks gestation
5.1	With one previous CS
5.2	With two or more previous CSs
6	All nulliparous women with a single breech pregnancy
7	All multiparous women with a single breech pregnancy including women with previous CS(s)
8	All women with multiple pregnancies including women with previous CS(s)
9	All women with a single pregnancy with a transverse or oblique lie, including women with previous CS(s)
10	All women with a single cephalic pregnancy < 37 weeks gestation, including women with previous CS(s)

The deliveries were also analysed based on the indications for the caesarean section⁽¹⁴⁾⁽¹⁵⁾. The indications have been classified as follows:

Table 2: Indications Of Caesarean Section Delivery

Emergency	Elective	No Medical Indication
1. Fetal distress	1. Malposition and malpresentation	1. Maternal wish
2. Fetal-pelvic disproportion (maternal and fetal causes)	2. Placenta previa	2. Incorrect diagnosis of indication
3. Failed surgical induction of labour	3. Previous CS a) Primary CS due to recurrent indication (contracted pelvis) b) Previous two CS c) Features of scar dehiscence d) Previous classical CS	3. Others
4. Prolonged labour	4. Presence of comorbidities: a) Hypertensive disorders of pregnancy b) Diabetes mellitus in pregnancy c) Heart Disease in pregnancy d) Benign or malignant pelvic tumours e) Others	
5. Obstructed labour	5. Others	
6. Antepartum Haemorrhage a) Placenta Previa (bleeding) b) Placental abruption		
7. Cord prolapse		
8. Scar dehiscence		
9. Hypertensive disorders of pregnancy		
10. Malposition and Malpresentation		
11. Others		

The information was then analysed to classify the cases under the Robson's classification as well as to find the percentage contribution of each indication to the total number of caesarean sections. The indications were also correlated with the group under the Robson's classification. Any medically unindicated caesarean sections were identified, and their percentage calculated.

OBSERVATIONS AND RESULTS:

A) classification Of Cases Based On Robson's Classification

Table 3: Distribution Of Cases Under Robson's Classification

Group	No. of cases (out of 300)	Percentage (of total no. of CS)
1	77	25.67%
2 A	8	2.67%
2 B	4	1.33%
3	18	6%
4 A	6	2%
4 B	2	0.67%
5.1	83	27.67%
5.2	22	7.33%
6	30	10%
7	10	3.33%
8	18	6%
9	6	2%
10	16	5.33%
Total	300	100%

It was observed that Group 5 made the highest contribution of **35%** to total number of caesarean sections.

B) Analyses Of Indications Of Current Caesarean Section:

Table 4: Distribution Of Cases Based On Indications Of Current Caesarean Section

INDICATION	ROBSON'S GROUPS													TOTAL	PERCENTAGE (OF TOTAL NO. OF CS)
	1	2A	2B	3	4A	4B	5.1	5.2	6	7	8	9	10		
Emergency	62	6	2	12	6	-	54	-	18	4	10	2	12	188	62.67%
Elective	8	2	2	4	-	2	15	22	12	6	6	4	4	87	29%
No indication	7	-	-	2	-	-	14	-	-	-	2	-	-	25	8.33%
TOTAL	77	8	4	18	6	2	83	22	30	10	18	6	16		

Out of the 300 caesarean section procedures, 188 (62.67%) are emergency, 87 (29%) are elective and 25 (8.33%) are not indicated.

Table 5: Distribution Of Cases Based On Emergency Indications Of Current Caesarean Section

INDICATION	ROBSON'S GROUPS													TOTAL	PERCENTAGE (OF TOTAL NO. OF CS)
	1	2A	2B	3	4A	4B	5.1	5.2	6	7	8	9	10		
Emergency indication															
Fetal Distress	32	-	-	8	4	-	8	-	-	-	4	-	4	60	20%
Scar Dehiscence	-	-	-	-	-	-	28	-	-	-	-	-	-	28	9.33%
Fetal-pelvic Disproportion (maternal and fetal causes)	8	2	-	-	-	-	10	-	4	-	2	-	-	26	8.67%
Hypertensive disorders of pregnancy	8	-	2	2	-	-	-	-	-	-	-	-	8	20	6.67%
Malposition and Malpresentation	-	-	-	-	-	-	-	-	14	2	-	2	-	18	6%
Prolonged labour	6	-	-	-	2	-	4	-	-	-	2	-	-	14	4.67%
Placental abruption	6	-	-	2	-	-	2	-	-	-	2	-	-	12	4%
Cord prolapse	2	-	-	-	-	-	2	-	-	-	-	-	-	4	1.33%
Failed surgical	-	4	-	-	-	-	-	-	-	-	-	-	-	4	1.33%

induction of labour															
Placenta Previa	-	-	-	-	-	-	-	-	-	2	-	-	-	2	0.67%
TOTAL	62	6	2	12	6	-	54	-	18	4	10	2	12		

Table6: Distribution Of Cases Based On Elective Indications Of Current Caesarean Section

INDICATION	ROBSON'S GROUPS												TOTAL	PERCENTAGE (OF TOTAL NO. OF CS)	
Elective Indication	1	2A	2B	3	4A	4B	5.1	5.2	6	7	8	9	10		
Previous 2 CS	-	-	-	-	-	-	-	22	-	-	4	-	2	28	9.33%
Malposition and Malpresentation	-	-	-	-	-	-	2	-	12	6	2	4	-	26	8.67%
Hypertensive disorders of pregnancy	-	2	-	4	-	2	4	-	-	-	-	-	-	12	4%
Diabetes Mellitus in pregnancy	2	-	-	-	-	-	4	-	-	-	-	-	-	6	2%
Heart Disease	4	-	-	-	-	-	-	-	-	-	-	-	2	6	2%
Placenta Previa	2	-	2	-	-	-	-	-	-	-	-	-	-	4	1.33%
Previous CS was due to a recurrent indication	-	-	-	-	-	-	4	-	-	-	-	-	-	4	1.33%
Others	-	-	-	-	-	-	1	-	-	-	-	-	-	1	0.33%
TOTAL	8	2	2	4	-	2	15	22	12	6	6	4	4		

Table 7: Distribution Of Cases Based On Unindicated Current Caesarean Sections

INDICATION	ROBSON'S GROUPS													TOTAL	PERCENTAGE (OF TOTAL NO. OF CS)
	1	2A	2B	3	4A	4B	5.1	5.2	6	7	8	9	10		
No Indication															
Maternal Wish	7	-	-	2	-	-	10	-	-	-	2	-	-	21	7%
Indication not recorded	-	-	-	-	-	-	2	-	-	-	-	-	-	2	0.67%
Others	-	-	-	-	-	-	2							2	0.67%
TOTAL	7	-	-	2	-	-	14	-	-	-	2	-	-		

The highest contributing emergency indications in our study, are fetal distress (20%), followed by scar dehiscence (9.33%) which is followed by fetal-pelvic disproportion (8.67%). The highest contributing elective indications are previous two caesarean sections (9.33%), followed by malposition and malpresentation (8.67%) which is followed by hypertensive disorders of pregnancy (4%). Maternal wish is the most important cause of unindicated sections (7%)

C) Analysis of Robson's Group 5:

According to the data presented above, Group 5 was found to be the leading contributor to the overall number of caesarean sections.

Group 5 consists of: All multiparous women with at least one

previous caesarean section delivery, with a single cephalic pregnancy, ≥ 37 weeks gestation.

It is further divided as follows:

Group 5.1: Previous 1 caesarean section

Group 5.2: Previous 2 or more caesarean sections

Table 11: Distribution Of Cases In Group 5

Group 5	No. of cases	Percentage (of cases in Group 5)
5.1	83	79%
5.2	22	21%
Total	105	100%

79% of cases in Group 5 have had one previous caesarean delivery (Group 5.1). 21% of cases in Group 5 have had two or more caesarean deliveries (Group 5.2).

The highest contributing emergency indication in Group 5 is scar dehiscence of previous caesarean section scars making a contribution of 26.67% (28 out of 105 cases). The highest contributing elective indication is previous 2 caesarean sections making a contribution of 20.95% (22 out of 105 cases). The most important cause of unindicated sections in Group 5 is maternal wish making a contribution of 11.43% (12 out of 105 cases)

DISCUSSION:

The results of our study showed that Robson's Group 5 made the highest contribution of **35%** (105 out of 300 cases) to the total number of caesarean sections. This was found to be similar to the findings of studies by Panicker S *et al*⁽¹⁰⁾, Kazmi T *et al*⁽⁹⁾, Ray A *et al*⁽¹¹⁾, in whom also, the leading contributor to the total number of caesarean sections was Group 5. The percentage contribution of Group 5 to the total number of sections however varied from these studies. This result was found to be in disagreement with that of Mbaye M *et al*⁽⁸⁾, in whose study Group 1 was the leading contributor. It was also in disagreement with the findings of Tura AK, Pijpers O, de Man M, *et al*⁽¹⁷⁾, in whose study Group 3 was the leading contributor.

Our study showed that Group 1 made the second highest contribution of 25.67% to the total number of sections. This was consistent with the findings of Kazmi T *et al*⁽⁹⁾, in whose study also, Group 1 was the second highest contributor after Group 5.

The third highest contribution to the total number of sections in our study was made by Group 6, which made a contribution of 10%. This was in disagreement to the findings of Mbaye *et al.*⁽⁸⁾, Kazmi *T et al.*⁽⁹⁾, Panicker *S et al.*⁽¹⁰⁾, Ray *A et al.*⁽¹¹⁾, Tura AK, Pijpers O, de Man M, *et al.*⁽¹⁷⁾ none of whom had Group 6 in the top three contributors to the overall number of caesarean sections. Group 6 consists of all nulliparous women with a single breech pregnancy. Thus, our study showed that our tertiary health centre had an unusually high number of caesarean breech deliveries in nulliparous women, in comparison to studies conducted at other hospitals. Out of the 30 caesarean breech deliveries in Group 6, 18 were emergency and 12 were elective.

We further analysed the cases in our study group based on the indications of the sections. Overall, the highest contributing indication was found to be fetal distress which made a contribution of 20% (60 out of 300 cases). This was found to be similar to the findings of Panicker S *et al*⁽¹⁰⁾ and Tura AK, Pijpers O, de Man M, *et al*⁽¹⁷⁾ in whose studies also fetal distress and fetal compromise were the highest contributing indications. This was however found to be in disagreement to the findings of Mbaye M *et al*⁽⁸⁾ in whose study the highest contributing group was Group 1 and the highest contributing indicator of Group 1 was fetal-pelvic disproportion which made a contribution of 55.2%. The second highest contributing indicators in our study were scar dehiscence of previous caesarean section scars (28 out of 300 cases) and previous two caesarean sections (28 out of 300 cases), both of which made contributions of 9.33% each. This was followed by fetal-pelvic disproportion (26 out of 300 cases) and malposition and malpresentation (26 out of 300 cases) being the third highest contributors, both of which made contributions of 8.67% each. This was partly similar to findings of Tura AK, Pijpers O, de Man M, *et al*⁽¹⁷⁾ in whose study also fetal-pelvic disproportion and previous caesarean sections followed fetal distress as the second and third highest contributing indications.

Since Group 5 made the highest contribution out of all other groups, it

was further analysed. As mentioned above, Group 5.1 contributed to 27.67% of total caesarean deliveries and Group 5.2 contributed to 7.33% of total caesarean deliveries. Out of 105 cases in Group 5, 83 cases, i.e., 79% cases belonged to Group 5.1 and 22 cases, i.e., 21% cases belonged to Group 5.2. This was in contrast to findings of Mbaye M *et al*⁽⁸⁾, in whose study Group 5.2 contributed to 31.2% of the cases in Group 5. On analysing Group 5 based on the indications of the section, we found that, out of 105 caesarean section deliveries in Group 5, 54 (51.43%) were emergency, 37 (35.24%) were elective and 14 (13.33%) were not indicated. Overall, scar dehiscence of previous caesarean sections made the highest contribution of 26.67% to the indications of the current caesarean delivery in the cases in Group 5. The second highest contribution of 20.95% was made by cases having previous two caesarean sections. The third highest contribution of 11.43% was by maternal wish. The highest contributing emergency indication was scar dehiscence (26.67%). The highest contributing elective indication was cases with previous two caesarean sections (20.95%), which mainly made up Group 5.2. The most important cause of unindicated sections was maternal wish (11.43%) which contributed to 12 out of 14 sections in Group 5.

In conclusion I would like to say that the Robson's classification is easy to use, clinically relevant and reproducible. It should be integrated into the protocols of all hospitals in our country and ideally in the world so that data pertaining to caesarean deliveries can be compared and analysed across hospitals, cities and countries in a standardized way and conclusions can be drawn.

As mentioned above, if performed unnecessarily, a caesarean section is associated with short and long-term complications which can be detrimental to the health of the mother, her child as well as future pregnancies⁽¹⁾⁽⁵⁾.

8.33% of the caesarean sections in our study had no medical indication, out of which 7% were due to maternal wish. Thus, it is essential that any pregnant women opting for a caesarean delivery when not medically indicated should be counselled about the maternal and fetal complications it poses to current as well as future pregnancies. Care should be taken by the obstetrician to correctly diagnose the indications for the caesarean section especially in emergency situations so as to prevent any medically unindicated sections.

14 cases in Group 5.1 (women having one previous caesarean section) underwent a repeat caesarean section which was not medically indicated. These women could have been given a trial of labour after caesarean delivery (TOLAC). Trial of labour after caesarean delivery (TOLAC) refers to a planned attempt to deliver vaginally by a woman who has had a previous caesarean delivery, regardless of the outcome⁽¹⁸⁾. TOLAC helps us to achieve the goal of vaginal birth after caesarean delivery (VBAC) in these patients. A successful VBAC is associated with reduced maternal morbidity, a decreased risk of complications in future pregnancies as well as a decrease in overall caesarean section rate at a population level⁽¹⁸⁻²¹⁾. However, it is necessary to carefully evaluate all factors and risks before considering a patient as a candidate for TOLAC as is mentioned in the VBAC guidelines given by The American College of Obstetricians and Gynecologists⁽¹⁸⁾.

It is necessary that we seriously integrate VBAC into the delivery protocols of all hospitals that are equipped to perform it as it has the potential to significantly reduce caesarean sections rates in our country.

All women undergoing a caesarean delivery should be counselled and provided with appropriate contraception so as to prevent them from conceiving immediately and helping them to space their children. This will reduce the risk of scar dehiscence and scar rupture in subsequent pregnancies.

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