

# Adoption of Robson's Ten Group Classification System (RTGCS) to Analyse Caesarean Section Rates at a Tertiary Care Centre in Pakistan

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## Abstract

**Objective:** To assess the utility of Robson's ten group classification system (RTGCS) as an auditing tool for caesarean section rates.

**Methods:** The present study was conducted by collecting data retrospectively from hospital records of Gynaecology and Obstetrics Unit 3, Abbasi Shaheed Hospital for the years 2013 and 2016. The rates of both years were compared in terms of RTGCS. After the initial audit in 2013, a three point strategy was implemented and the audit cycle repeated.

**Results:** During the year 2013, 1986 women delivered in the hospital, 610 underwent caesarean section. The caesarean rate for the year was 30.7%. In the year 2016, 1560 women delivered at the unit, out of which, 412 births were by caesarean section. After the implementation of the three point strategy, which was formulated in the light of RTGCS, the caesarean rate was 26.4% in the year 2016.

**Conclusion:** The adoption of RTGCS is the first step to analyse the obstetric practice in a standardised manner.

**Keywords:** Caesarean section, clinical audit, tertiary care centre, hospital obstetrics and gynaecology department.

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## Introduction

The caesarean section rates worldwide are on the rise. The World Health Organization recommended in 1985 that there is no justification in any specific geographical region to have more than 10-15% of caesarean births, as these high rates are not associated with any additional reduction in maternal and neonatal mortality and morbidity<sup>1,2</sup>. The caesarean section rates from the Eastern Mediterranean region was around 10%, but this data can-

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not be considered representative of the whole region as it was mostly hospital-based and not a true reflection of the community<sup>3</sup>. Rates from different member countries are alarmingly high.

The decision that leads to a caesarean birth can only be understood if the whole scenario that led to that decision is analysed. There are different methods adopted for diagnosing labour, accelerating labour, the indications for inducing labour and indications of caesarean sections in different setups. In the face of these differences, the comparison of results of these decisions that culminate in caesarean births over time in the same department or between departments becomes technically impossible.

To standardise these analyses, the World Health Organization proposed adoption of the ten group classification system by Robson, for assessing and monitoring caesarean sections within and between healthcare facilities<sup>4,5</sup>. This classification has been extensively used to analyse caesarean rates internationally<sup>6,7</sup>.

The stratification into groups appears to be a more logical approach because a lot cannot be said about a rate in general. If some context is revealed the discussion becomes relevant. But the discussion does not end there. The classification can provide more insight about a group and reasons for the high rate can be addressed<sup>8</sup>.

This classification thus renders itself as a perfect tool to audit the obstetric practice. The rates in each category can be analysed through an audit and after careful evaluation; the measures to decrease these rates can be proposed<sup>9</sup>. The initial audit is the starting point to build up on the reasons of the rate gathered in each category. This paper describes the use of this classification as an audit tool.

## Methods

The present study was conducted at the Department of Gynaecology and Obstetrics Unit 3, Abbasi Shaheed Hospital, Karachi, Pakistan, by collecting data retrospectively from hospital records for the years 2013 and 2016. The initial audit involved the use of data from the year 2013. The labour room records from January to December were compiled and analysed. A structured pro forma based on the ten group classification system of caesarean births was used to extract data. The Robson criteria is a ten group classification system, using 10 mutually exclusive and totally inclusive categories for caesarean section i.e. all women can only be classified into only one group, as shown below (Table 1). The pro forma used basic six items needed to classify a woman to one of the ten groups; (i) parity; (ii) presentation; (iii) number of foetuses; (iv) previous mode of delivery; (v) gestational age at delivery; and (vi) onset of labour.

Three separate items analysing the mode of delivery and indication for inductions and caesareans were added to the pro forma to gain additional insight into the common indications at the facility. Each woman was classified into one of the ten groups on the basis of the classification system, shown in Fig. 1.

After the data for the first audit were analysed, a series of meetings took place with the unit head. The results were discussed with all the senior consultants and residents. All senior consultants and junior doctors attended the annual department meeting where, in the light of these discussed results, the unit head formulated a three point strategy which was implemented from 2016 in the unit.

The three points were (a) 24-hour senior registrar presence on the floor; (b) structured counselling for women with previous caesarean delivery during the antenatal visits regarding vaginal birth after caesarean section; and (c) review of all women with failed induction by a senior obstetrician and joint decision regarding caesarean birth. Data collection was repeated after implementation of the strategy in the year 2016. Data were analysed using the SPSS software program, version 15.0. The qualitative variables were coded as parity (nulliparous/parous), presentation (cephalic/breech/abnormal), number of foetuses (single/multiple), previous mode of delivery (caesarean/normal birth), gestational age at delivery (greater than or equal to 37 weeks/less than or equal to 36 weeks), onset of labour (spontaneous/induced/pre-labour caesarean) and mode of delivery (vaginal birth/caesarean section). The primary outcome measure was caesarean section rate as determined by the above mentioned parameters.

The ethical approval from the review board of the institution was not needed as this study was an audit of case records. The unit head consented to use of records and supervised the study.

## Results

During the year 2013, 1986 women delivered in the hospital, 610 underwent caesarean section. The

caesarean rate for the year was 30.7%. Group 3 (33.7%, 671 women) and group 1 (25.2%, 502 women) represented the majority of women who delivered at the facility. The caesarean rate (63.4%) was highest in group 5. In groups 6, 8 and 9 caesareans rates were 92%, 77.2% and 100% respectively. Table 1 shows the size of groups, caesarean rates in each group and absolute contribution to the caesarean rate of each group in 2013. Group 5 (7.8%) made the biggest absolute contribution to caesarean section rate. This was closely followed by group 3, contribution of 6.5% and group 1 that contributed 5.6% to the total rate of 30.7% in the department for the year 2013.

In the year 2016, 1560 women delivered at the unit, out of which, 412 births were by caesarean section. After the implementation of the three point strategy, the caesarean rate was 26.4%. Most women who delivered in 2016 also belonged to group 3 (490, 31.4%). The caesarean rate for group 5 in 2016 was 57%. Table 2 shows the size of groups, caesarean rates in each group and absolute contribution to the caesarean rate of each group in 2016.

In 2016, the contribution of group 5 fell from 7.8 to 7.1%. Group 3 contributed 4.6% as compared to 6.5% in the previous year and group one's contribution fell to 4.4% from the previous year's 5.6%. The caesarean rates in group 1 to 5 fell, whereas the rates in groups 6-10 remained fairly constant as shown in Fig. 1.

## Discussion

The present study shows the utility of Robson's ten group classification system for caesarean section as an auditing tool. The classification helped stratify the rates in various groups that enabled the department in coming up with a strategy to decrease the rate. The rate fell from 30.7% to 26.4% in three years just by implementing three simple measures. This fall, though seemingly small, is still dramatic if the whole picture is taken into consideration.

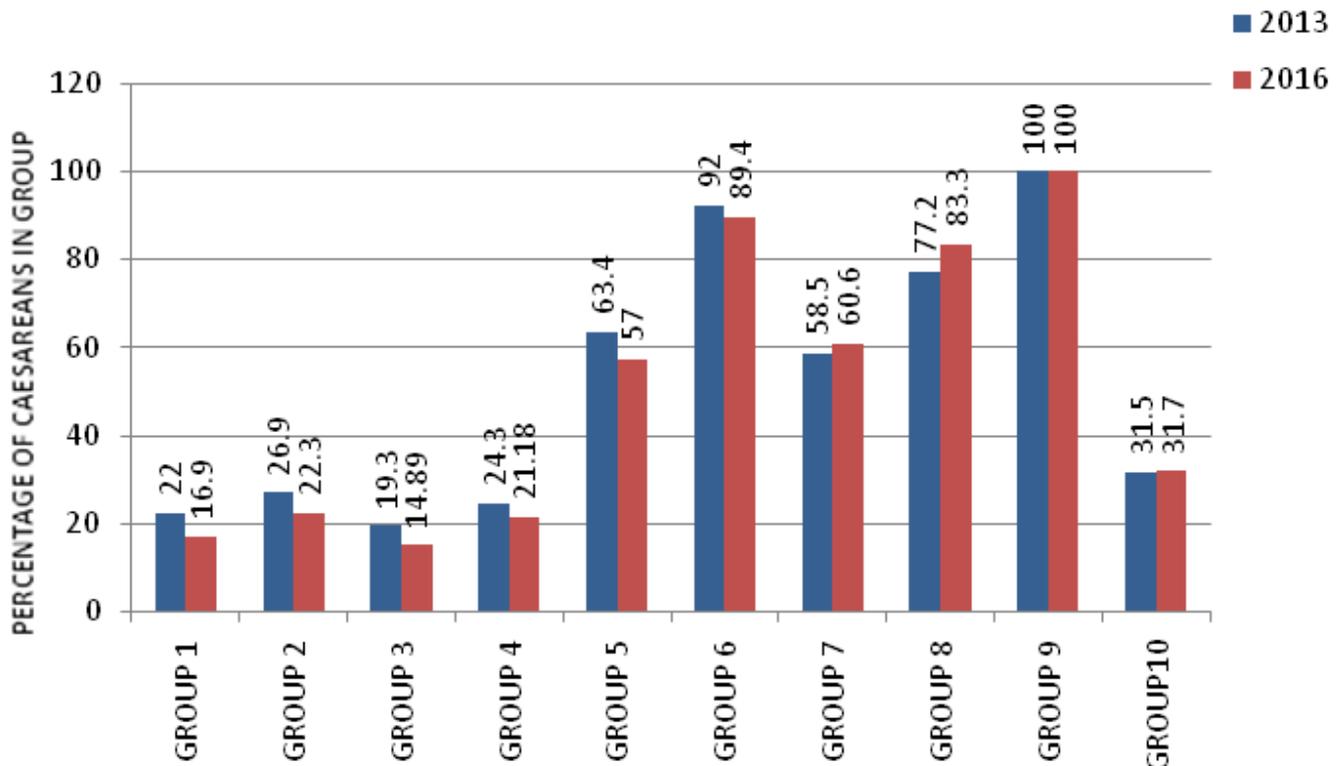
Caesarean rates are a major concern worldwide, rates as high as 42% in Turkey, to as low as 15.7% in Finland have been reported<sup>10</sup>. In Iran, an overall caesarean section rate of 34% in year 2000 and 2006 with only a change in indications for caesarean section was reported<sup>11</sup>. In the United States of America, caesarean rate hiked from 26% to 36.5% between 2003 and 2009; 50.0% of the increase was attributed to an increase in primary caesarean delivery<sup>12</sup>.

Robson's classification has been utilised for comparing rates many a times in the past. But the true purpose of this classification is to standardise women into groups that can be compared over time in different units or in the same unit. An initial data collection from many countries using Robson's has established that primary caesareans and women with previous caesarean delivery contribute most heavily to these rates<sup>13</sup>.

The data worldwide shows greater contribution from groups 1-5 than groups 6-10. The larger size of these groups in the population is a reason cited for this contribution. The caesarean rates in group 6 to 10 are higher but overall contribution to caesarean rate is low because the size of these groups is smaller. The higher rate in these cases is secondary to recommendations for delivering these women, i.e. primiparous breech or abnormal lie<sup>14,15</sup>.

But the utility of the classification does not end there. It provides a basic framework on which future recommendations can be built after careful scrutiny. Robson et al. showed in their publications how practices can be refined using the preliminary data as a guide<sup>16</sup>.

In our initial audit, primary caesarean delivery rates as shown by caesareans in group 1, 2, 3 and 4 were 22%, 26.9%, 19.3% and 24.3%, respectively. One in every four women underwent a caesarean section; a primary caesarean section. These results were not significantly different than rates reported worldwide<sup>17</sup>. An area needing improvement was thus brought to light. The primary caesarean delivery in these cases thus raised a specific con-



- GROUP 1: Nulliparous, single cephalic,  $\geq 37$  weeks, spontaneous labor
- GROUP 2: Nulliparous, single cephalic,  $\geq 37$  weeks, induced or caesarean before labor
- GROUP 3: Multiparous (excluding previous caesareans), single cephalic,  $\geq 37$  weeks, and spontaneous labor
- GROUP 4: Multiparous (excluding previous caesareans), single cephalic,  $\geq 37$  weeks, induced or caesarean before labor
- GROUP 5: Previous caesarean, single cephalic  $\geq 37$  weeks
- GROUP 6: All nulliparous breeches
- GROUP 7: All multiparous breeches (including previous caesareans)
- GROUP 8: All multiple pregnancies (including previous caesareans)
- GROUP 9: All abnormal lies (including previous caesareans)
- GROUP 10: All single cephalic,  $\leq 36$  weeks (including previous caesareans)

Fig. 1. Comparison of caesarean rate in each group between year 2013 and year 2016.

Table 1. The Robson Ten Group Classification for the year 2013.

Group #	Total no. of Caesarean Deliveries / Total no. of Deliveries in the Institution 610/1986	Size of group	% caesarean delivery Rate in group	% Contribution of each group
Group 1	112/502	25.2	22	5.6
Group 2	49/182	9.16	26.9	2.4
Group 3	130/671	33.7	19.3	6.5
Group 4	35/144	7.25	24.3	1.7
Group 5	156/246	12.3	63.4	7.8
Group 6	23/25	1.2	92	1.1
Group 7	24/41	2.06	58.5	1.2
Group 8	17/22	1.1	77.2	0.8
Group 9	23/23	1.15	100	1.1
Group 10	41/130	6.5	31.5	2.0

Size of Group= number of women in each group / the total number of women in the population x 100

% of caesarean deliveries in group= the number of caesareans carried out in each group / the number of women in each group x 100

% of contribution of each group= the number of caesarean deliveries in each group / the total number of women in the population x 100

Table 2. The Robson Ten Group Classification for the year 2016

Group #	Total no. of Caesarean Deliveries / Total no. of Deliveries in the Institution 610/1986	Size of group	% caesarean delivery Rate in group	% Contribution of each group
Group 1	69/408	26	16.9	4.4
Group 2	40/179	11.4	22.3	2.5
Group 3	73/490	31.4	14.89	4.6
Group 4	25/118	7.5	21.18	1.6
Group 5	111/195	12.5	57	7.1
Group 6	17/19	1.2	89.4	1.08
Group 7	20/33	2.1	60.6	1.2
Group 8	15/18	1.1	83.3	0.9
Group 9	15/15	0.9	100	0.9
Group 10	27/85	5.4%	31.7	1.7

Size of group= number of women in each group / the total number of women in the population x 100

% caesarean delivery rate in group= the number of caesareans carried out in each group / the number of women in each group x 100

% of contribution of each group= the number of caesarean deliveries in each group / the total number of women in the population x 100

cern. A study reports presence of a consultant lowers the caesarean rate by 40%<sup>18</sup>. After analysing the high rates in group 1 and 3 for primary caesarean section, this recommendation was implemented as a part of the three point strategy. Post-implementation, the caesarean rates in these groups fell down.

In our study the largest contribution to the overall caesarean rate was made by group 5. Similar findings have been reported from a study in Italy<sup>19</sup>. The high rate in this group has been a mat-

ter of discussion and has attracted a lot of criticism towards the community regarding the promotion of vaginal birth after caesarean section<sup>20</sup>. The vaginal birth after caesarean section (VBAC) is a valid option for women with nonrecurring indications and is safe if a delivery is conducted at a hospital<sup>21</sup>. A rate of successful trial of labour after caesarean section as high as 80% has been reported by a Taiwanese cohort<sup>22</sup>.

A study reports that more knowledge about the risks and benefits of trial of labour and elective re-

peat caesarean section was found to be positively associated with the decision of undergoing trial of scar<sup>23</sup>. A structured counselling session was therefore provided to all women reporting to the hospital with previous caesarean section. The pros and cons were explained and success rate quoted for a vaginal birth. The caesarean rate fell from 63% to 57% in 2016. The overall contribution still remained high 7.1% in 2016 as compared to 7.8% in 2013, but even this small fall is still a measure of success.

Our initial rate of 63% fell to 57% after incorporating counselling. The only remedy to the high caesarean rate is that a trial should be given to women with previous caesarean delivery in a controlled atmosphere<sup>24</sup>. Our analysis proves that a counselling session can make a difference.

The caesarean rates from all over the world showed higher rates in groups 2 and 4. Similarly, our study had a high rate for failed inductions ending in a section. The indications for inductions are increasing and obstetricians are faced with unfavourable cervixes.

Failed induction is defined as the failure to enter the active phase of labour, considering that the definition of induction of labour (IOL) is to enter the active phase of labour. Absence of consensus on what constitutes a failed induction, the standard inducing agent, duration of induction and improper counselling regarding expectation of the women is a reason quoted for failed inductions<sup>25</sup>. Our strategy ensured counselling of these women and adoption of a strict induction protocol that allowed women to have a real chance of delivering.

Our study is the first from the region to show an impact of adoption of Robson's classification system in a delivery unit. The study has a moderate sample size. Its main limitation is its single-centred design. Because of the lack of acceptance of this classification as an audit tool at the regional level, other centres did not participate. The results achieved through its implementation in our setup are impressive and should encourage other centres to adopt it and utilise it to its full potential.

## Conclusion

The adoption of Robson's ten group classification system as an auditing tool for caesarean section rates is the first step to analyse the obstetric practice in a standardised manner. However, this should not be restricted to merely classifying women into groups but used to identify the groups that require further evaluation. After rigorous evaluation of the reasons, strategies to decrease caesarean rates based on these analyses must also be formulated and implemented.

## Conflict of Interest

Authors have no conflict of interests and no grant/funding from any organization.

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