

DOI: <http://dx.doi.org/10.18203/2320-1770.ijrcog20203339>

Original Research Article

## Analysis of caesarean sections at a tertiary care centre according to Robson's criteria

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**Received:** 17 June 2020

**Accepted:** 14 July 2020

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### ABSTRACT

**Background:** There has been a considerable increase in the rate of caesarean sections in the past few decades. Some demographers have argued that this increase is largely affected by the uprising trend of new medically indicated caesarean sections. M. S. Robson proposed a ten-group classification of caesarean sections in year 2001 which was appreciated by WHO in 2014 and FIGO in 2016. This classification is known as Robson's classification which has ten groups.

**Methods:** This is a retrospective study which was carried out at Civil Hospital, Karimnagar. The study group included all live births and still births of at least 500 gm birth weight or at least 28 weeks of gestation at Civil Hospital, Karimnagar during the period from October 2019 to December 2019. The data collected was analysed using simple statistical methods like percentage and proportion. The data was grouped according to the Robson's 10 group classification system. The overall caesarean section rate, size of each group and the relative contribution of each group to the overall CS rate were calculated.

**Results:** The total number of deliveries during the study period was 2493. Out of these, the number of caesarean deliveries was 1345. The caesarean section rate was calculated to be 53.95%. The group 5 (multiparous with at least one previous uterine scar with single cephalic pregnancy  $\geq 37$  weeks of gestation) contributed to 38.07% of the total caesarean section rate which is the highest.

**Conclusions:** A regular audit into the number and indications of caesarean sections will definitely help in decreasing the primary and repeat caesarean sections.

**Keywords:** Caesarean section, Robson's classification

### INTRODUCTION

There has been a considerable increase in the rate of caesarean sections in the past few decades. In 1985, WHO had proposed the ideal section rate should be between 10-15%.<sup>1</sup> But this rate has increased globally. The determinants of this increasing trend are controversial. Some demographers have argued that this increase is largely affected by the uprising trend of new medically indicated caesarean sections.<sup>2</sup>

So there arose a necessity for standardized classification of caesarean sections. M. S. Robson proposed a ten-group classification of caesarean sections in year 2001 which was appreciated by WHO in 2014 and FIGO in 2016.<sup>3,4</sup> This classification has been praised as it is simple, robust, reproducible and flexible. The categories in the Robson's criteria are mutually exclusive and are based on 5 basic obstetric characteristics: obstetric history (parity and previous mode of delivery), onset of labour (spontaneous, induced or CS before onset of labour), gestational age,

fetal presentation and lie (cephalic, breech or transverse) and the number of fetuses.<sup>5</sup>

**Aims and objectives**

- Categories the caesarean sections into the Robson’s ten groups according to their causes.
- To try finding out the causes of caesarean sections.
- To audit and standardize the indications of caesarean sections.

**METHODS**

This is a retrospective study which was carried out at Civil Hospital, Karimnagar. The study group included all live births and still births of at least 500 gm birth weight or at least 28 weeks of gestation at Civil Hospital, Karimnagar during the period from October 2019 to December 2019. All data was retrieved and entered in a preformed structured proforma. Various factors which were taken into consideration were the gestational age, route and type of delivery, presentation, number of fetuses and previous obstetric history. Finally, the data collected was analysed using simple statistical methods like percentage and proportion. The data was grouped according to the Robson’s 10 group classification system.

**Robson’s classification of caesarean sections**

- Group 1: Nulliparous with single cephalic pregnancy  $\geq 37$  weeks gestation in spontaneous labour
- Group 2: Nulliparous with single cephalic pregnancy  $\geq 37$  weeks gestation who either had labour induced or were delivered by caesarean section before labour
- Group 3: Multiparous without a previous uterine scar with single cephalic pregnancy  $\geq 37$  weeks gestation in spontaneous labour

- Group 4: Multiparous without a previous uterine scar with single cephalic pregnancy  $\geq 37$  weeks gestation who either had labour induced or were delivered by caesarean section before labour
- Group 5: All multiparous with at least one previous uterine scar with single cephalic pregnancy  $\geq 37$  weeks gestation
- Group 6: All nulliparous women with a single breech pregnancy
- Group 7: All multiparous women with a single breech pregnancy including women with previous uterine scars
- Group 8: All women with multiple pregnancies including women with previous uterine scars
- Group 9: All women with single pregnancy with a transverse or oblique lie including women with previous uterine scars
- Group 10: All women with single cephalic pregnancy  $\leq 36$  weeks gestation including women with previous scars.

**The parameters which were considered in the patients for analyzing the data are**

- Gestational age ( $\geq 37 / < 37$  weeks)
- Parity
- With/without previous caesarean section
- Presentation (cephalic/breech/ any other lie)
- Number of fetuses
- Labour (spontaneous/induced/pre-labour caesarean section)
- Indication of caesarean section.

The overall caesarean section rate, size of each group and the relative contribution of each group to the overall CS rate were calculated.

**Table 1: Classification of cases according to Robson’s criteria.**

Robson's 10 group classification	Total number of cases in each group (a)	Relative size of each group [a/∑a]%	Number of caesarean section in each group (b)	Caesarean section in each group [a/b]%	Contribution made by each group to overall CS rate [b/∑b]%
Nulliparous, single, cephalic, $\geq 37$ weeks in spontaneous labour	536	21.50	94	17.54	6.99
Nulliparous, single, cephalic, $\geq 37$ weeks induced or cs before labour	708	28.40	463	65.40	34.42
Multiparous (excluding previous cs), single cephalic, $\geq 37$ weeks in spontaneous labour	244	9.79	14	5.74	1.04
Multiparous (excluding previous cs), single cephalic, $\geq 37$ weeks, induced or cs before labour	146	5.86	33	22.60	2.45
Previous cs, single, cephalic, $\geq 37$ weeks	512	20.54	510	99.61	37.92
All nulliparous with breech presentation	26	1.04	26	100.00	1.93
All multiparous with breech presentation	9	0.36	8	88.89	0.59
All multiple pregnancies	43	1.72	43	100.00	3.20
All abnormal lies	21	0.84	21	100.00	1.56
All single, cephalic, $\leq 36$ weeks	248	9.95	133	53.63	9.89
Total	∑a=2493	100.00	∑b=1345		100

## RESULTS

The total number of deliveries during the study period was 2493. Out of these, the number of caesarean deliveries was 1345. The caesarean section rate was calculated to be 53.95%.

All data was analysed as shown in Table 1. The highest number of caesarean sections was found in Group 5 (multiparous with previous caesarean section with single  $\geq 37$  weeks, cephalic, induced or CS before labour). The total number of cases in this group was 512, out of which 99.6% (510 cases) underwent repeat caesarean section. This group contributed to 38.07% of the total caesarean section rate. The second highest contribution was made by Group 2 (nulliparous with single, cephalic,  $\geq 37$  weeks, induced or CS before labour), accounting for 34.42% of the overall caesarean section rate.

The caesarean section rate was noticed to be less in the spontaneous labour group (1 and 3), leading to only 6.99% and 1.04% of the total caesarean section rate respectively.

Though the number of cases with breech presentation was less, but they were directly taken up for caesarean section without giving any trial of labour. Only 1 case of multiparous lady with breech presentation was delivered vaginally as she came to labour room with full dilatation of cervix. The caesarean section rate among groups 6 and 7 was almost 100%.

Singleton cephalic,  $\leq 36$  weeks (Group 10) also contributed to 9.88% of total caesarean section rate.

## DISCUSSION

Robson's 10 group classification system has been proposed by WHO to monitor, standardize, classify and compare the caesarean section rates in various obstetric units over the world. It also helps to identify the group which contributes to maximum number of caesarean sections, which will finally lead to steps and protocols to decrease the CS rates within the health care sector.<sup>6</sup>

The caesarean section rate in this study was found out to be 53.95%. This rate is found to be similar to the study done by Jacob KJ et al.<sup>1</sup> This rate is very high, but this high rate is mainly because of the fact that our hospital is a referral centre and has a large number of complicated cases like pre-eclampsia, eclampsia, un-controlled gestational diabetes etc., which need immediate termination of pregnancy by caesarean section. Also, there are a large number of referred patients who had been already given trial of labour in other hospitals.

This study shows that the maximum number of caesarean section is contributed by group 5 (previous CS, single, cephalic,  $\geq 37$  weeks, induced or CS before labour). This same observation has also been

reported by Ray et al and Jacob KJ et al.<sup>1,7</sup> The proportion of women in group 5 has increased along with the caesarean section rate in these women as analysed by Vogel et al.<sup>8</sup>

In the present study it was observed that the number of women who attempt for VBAC has declined. Only 2 women out of 512 cases opted for VBAC. Vaginal birth after one caesarean section has been advocated to be safe by RCOG, SOGC and ACOG.<sup>9-11</sup> But still the number of VBAC has gone down over the years mainly due to fear of uterine rupture. VBAC needs continuous monitoring of the women during labour which is difficult in busy government setups like ours where case load is very high. So, in view of better maternal and fetal outcome, VBAC is not tried.

Number of women whose labour is induced is also increasing.<sup>12</sup> The indication and timing of induction should be evidence based. If the number of primary caesarean section decreases, it will eventually lead to decrease in repeat caesarean sections rate too.<sup>13</sup>

Out of all caesarean sections, the main indication of primary CS in this study was failure to progress and fetal distress (440 cases out of 557 cases accounting to 79% in Group 1 and 2). The use of inducing agents like oxytocin, epidural analgesia, increasing maternal age, maternal and fetal weight due to better antenatal care may have led to alterations in normal progress of labour. The definition of active labour has also changed over the years. It may be possible that some cases are undergoing caesarean section with the indication of failure to progress even before they set into active labour.<sup>14</sup> In this hospital, most of the cases were referred in view of severe pre-eclampsia, eclampsia, heart disease, haemoglobinopathies, liver diseases etc. These patients were given a trial with induction, but some were taken up for caesarean section without waiting too long for maternal benefit. So, the rate of CS in Group 2 and 4 is high in this study. Emergency caesarean section should be reviewed on regular basis to evaluate the indication which may result in lowering of CS rate.

Women with breech presentation were taken up for elective caesarean section to decrease neonatal and perinatal mortality and serious neonatal morbidity. The rate of these complications was significantly lower for the planned caesarean section group as compared to the planned vaginal birth group.<sup>14-16</sup> Although the number of women in group 6 and 7 is less (26 and 9 respectively in this study), still they have almost 100% caesarean section. Only one woman with breech presentation in this study had vaginal delivery because she came to labour room with full dilatation of cervix. To decrease the CS rate in these groups, external cephalic version has been suggested by Kathalia SK et al.<sup>17</sup>

Groups 6-10 are smaller groups with high percentage of CS rate. Caesarean section in these groups are due to

absolute obstetric indications. The similar CS rates have also been published by RCOG 18 and Stavrou EP et al.<sup>19</sup> The high caesarean section rate in Group 10 was mainly to improve the fetal outcome.

There are some lacunae in this classification also. It doesn't give any information regarding the previous medical, surgical or fetal disease and the degree of prematurity and trial of labour. So various modifications have been adopted like having subdivisions based on the mode of onset of labour.<sup>20</sup>

## CONCLUSION

Overall caesarean section rate in this study is high (53.95%) as opposed to the suggestion given by WHO. But this finding is mainly because this hospital is a tertiary care centre with a greater number of referred cases. Efforts have to be made to reduce the primary caesarean section rate which will lead to reduction in the overall CS rate. A regular audit into the number and indications of caesarean sections will definitely help in decreasing the primary and repeat caesarean sections.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

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**Cite this article as:** Mohapatra I, Samantaray SR, Vivekananda A, Manjula A, Priyanka B. Analysis of caesarean sections at a tertiary care centre according to Robson's criteria. Int J Reprod Contracept Obstet Gynecol 2020;9:3445-8.