EVALUATION OF CAESAREAN SECTION RATE USING ROBSON'S TEN GROUP CLASSIFICATION IN A TEACHING HOSPITAL

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ABSTRACT

BACKGROUND

Nowadays, caesarean section has become rampant in obstetric practice. There has been a dramatic increase in caesarean section rate all over the world over the last two decades and presently exceeds 30% in some regions. It is highly crucial that auditing to be done to review the caesarean section rate for standardization of obstetric care in terms of caesarean section. WHO proposed the Robson's ten group classification system as a global standard for analysing and comparing caesarean section rates.

The aim of our study is to stratify patients undergoing caesarean section into Robson's ten group classification system and analyse the caesarean section rates.

MATERIALS AND METHODS

This is a prospective observational study done at Government Victoria Hospital, a teaching hospital of Andhra Medical College, Visakhapatnam, from August 2017 to October 2017 and women undergoing vaginal delivery or caesarean section during this period were allocated into each group of Robson's ten group classification and results analysed.

RESULTS

The caesarean section rate in our study was 37.1%. The highest contribution was by Group 5, that is 38.9%, followed by Group 2, accounting for 24.5% of caesarean sections followed by Group 1, which was accounting for 13.9% of caesarean sections.

CONCLUSION

The use of Robson's Ten Group Classification system becomes a useful tool for monitoring and analysing caesarean section rates. The highest incidence of caesarean section rate was observed in Group 5, followed by Group 2, and then, Group 1. Hence, measures taken to reduce the incidence of primary caesarean section rate can to certain extent reduce the overall caesarean section rate.

KEYWORDS

Caesarean Section, Nulliparous, Singleton, Cephalic, Robson's Classification.

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BACKGROUND

The most commonly performed obstetrical operation is caesarean section. When medically justified, Caesarean section is a surgical boon and can prevent maternal and perinatal morbidity and mortality. Nowadays caesarean section has become rampant in obstetric practice.

The caesarean section rate (CS) has been rising over last five decades. It has risen from 5% in 1940s and 1950s to 15% in 1970s and 1980s. But during the last two decades there has been a dramatic rise in caesarean section rate worldwide which now exceeds 30% in some regions.[1] The caesarean section rate increased overall between the two surveys (from 26.4% in the WHO GS survey to 31.2% in the WHO MCS, p=0.003) and in all countries except Japan.[2] From 1996 to 2007, the caesarean rate raised by 53% reaching 32%, the highest rate ever in United States. Many states of India including Kerala (highest 25.74%), Pondicherry, Goa, Tamil Nadu and Andhra Pradesh are above WHO guideline of 15%.[3]

There's a growing concern about the higher incidence of long-term complications following one or more caesarean sections such as Placenta accreta, retained placenta, uterine rupture and possible need for peripartum hysterectomy.[4]

The crude rate of caesarean section surgery is an important global indicator for measuring access to obstetric services.[2]

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In 1985, WHO stated that there is no justification in any specific geographic region to have more than 10 to 15% Caesarean Section births.[2,5] Rate above 15% are not associated with additional reduction in maternal and neonatal mortality and morbidity.[5]

Keeping in view of the rising rates of caesarean section globally, it is highly crucial that an auditing be done in order to analyse the caesarean section rates and enable targeted interventions to reduce caesarean section rates appropriately.

A 2011 systematic review by Torloni and colleagues of 27 caesarean section classification systems identified ten group classification system proposed by ROBSON in 2001 as most appropriate to compare surgery rates.[2]

Robson's system classifies all deliveries into one of the ten groups on the basis of five parameters-

1. Obstetric history (parity and previous caesarean section).
2. Onset of labour (spontaneous, induced, or caesarean section done before onset of labour).
3. Foetal presentation or lie (cephalic, breech or transverse).
4. Number of neonates and
5. Gestational age (preterm or term).

The ten Robson categories are mutually exclusive, totally inclusive and can be applied prospectively to analyse trends and determinants of caesarean section and helps in institution specific monitoring and auditing.

In April 2015, WHO proposed the Robson's ten group classification system as a global standard for monitoring and comparing caesarean section rates within health care facilities over time and facilities.[6,7]

Group 1	Nulliparous,single cephalic pregnancy >37wks in spontaneous labour
Group 2	Nulliparous,single cephalic pregnancy >37wks who had labour induced or delivered before labour by C-Section
Group 3	Multiparous, without previous uterine scar with single cephalic pregnancy >37wks in spontaneous labour
Group 4	Multiparous, without previous uterine scar with single cephalic pregnancy >37wks who had labour induced or delivered before labour by C- section
Group 5	All multiparous,with atleast one previous uterine scar, with single cephalic pregnancy >37wks
Group 6	All nulliparous with single breech pregnancy
Group 7	All multiparous with single breech including women with previous scars
Group 8	All women with multiple pregnancies including those with uterine scars
Group 9	All women with single pregnancy with transverse or oblique lie including women with previous scars
Group 10	All women with single cephalic <37 wks including women with previous scars

Table 1. Robson's Ten Group Classification System

Objectives of the Study

1. To stratify patients undergoing caesarean section into Robson's ten group classification system and
2. To analyse the caesarean section rates.

MATERIALS AND METHODS

This is a prospective observational study done at Government Victoria Hospital, a teaching Hospital of Andhra medical college, Visakhapatnam, for a period of 3 months from August 2017 to October 2017 and all pregnant women of all age groups undergoing vaginal delivery or caesarean section during this period were allocated into each group of Robson's ten group classification and results analysed.

RESULTS

There were total number of 1448 deliveries during the study period in our hospital, among which, 910 were vaginal deliveries, contributing to 62.9% and 538 were caesarean sections, contributing to 37.1% of the total deliveries.

Total No. of deliveries= 1448.

Total No. of C-sections = 538 contributing to 37.1%.

Total No. of normal Deliveries = 910 contributing to 62.9%.

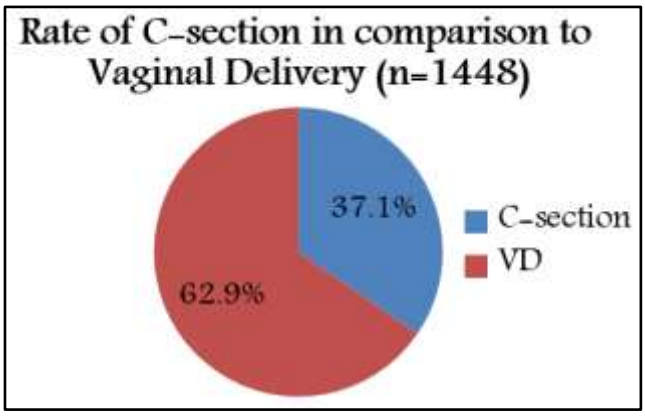

Figure 1

Group Wise Analysis

Out of 538 caesarean sections, contribution of each group to caesarean section was as follows.

Group	No. of Caesarean Sections (N=538)	Percentage (%)
Group 1	75/538	13.9%
Group 2	132/538	24.5%
Group 3	21/538	4.0%
Group 4	36/538	6.7%
Group 5	210/538	38.9%
Group 6	27/538	5.01%
Group 7	18/538	3.4%
Group 8	6/538	1.1%
Group 9	6/538	1.1%
Group 10	7/538	1.3%

Table 2. Group Wise Analysis

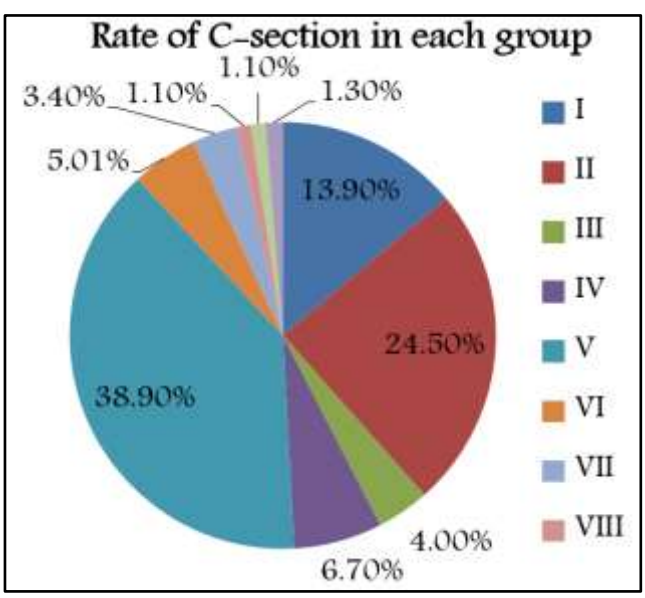

Figure 2. Contribution of Each Group to Overall C-Section Rate

(N=538)

Group 5 was the largest contributor accounting for 210 caesarean sections, that is 38.9%, followed by group 2 with 132 caesarean sections contributing to 24.5% of C sections followed by group 1 with 75 C sections resulting in 13.9% of C section rate. In group 8 and 9 least number of C sections have taken place that is 6 number contributing to 1.1% of C section rate each.

Group	Number of C Sections	Percentage
1	75	5.2%
2	132	9.1%
3	21	1.4%
4	36	2.5%
5	210	14.5%
6	27	1.8%
7	18	1.2%
8	6	0.4%
9	6	0.4%
10	7	0.5%
Normal Deliveries	910	62.9%

Table 3. Rate of C-Section in Total Deliveries

(N= 1448)

In our study, group 5 was the largest contributor leading to 14.5% of overall C section rate followed by group 2 (9.1%), followed by group 1 (5.2%), group 8 and 9 were lowest in order contributing to 0.4% of overall caesarean section rate.

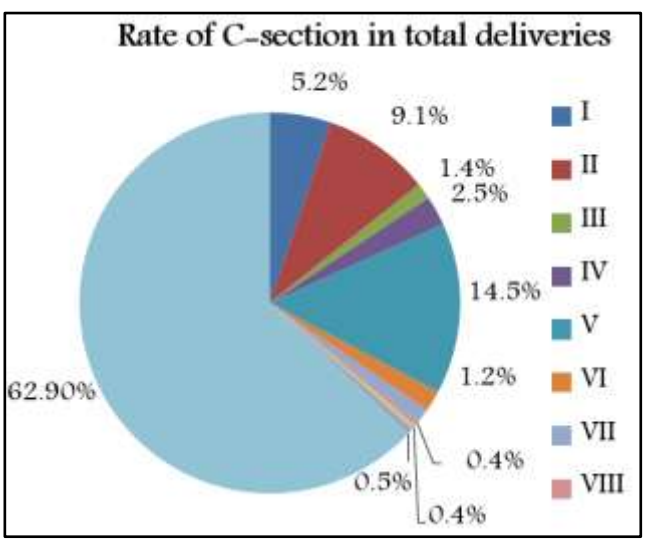

Figure 3. Rate of C-section in Total Deliveries

Group	Normal Delivery	C Section	Total	% of C Section
1	218	75	293	25.6%
2	246	132	378	35%
3	114	21	135	15.5%
4	312	36	348	10.3%
5	2	210	212	99%
6	1	27	28	96.4%
7	2	18	20	90%
8	2	6	8	75%
9	0	6	6	100%
10	13	7	20	36.8%
	N=910	N=538	N=1448	

Table 4. Analysis of Total Deliveries

(N= 1448)

Group 9 (single pregnancy with transverse or oblique lie including women with previous scars) had 100% c section rate in our study, followed by group 5 (single, cephalic pregnancy at or more than 37 weeks with previous uterine scar) contributing to 99% of C section rate followed by group 6 (nulliparous with single breech) contributing to 96.4% of c section rate. Following breech trail even in our hospital all nulliparous single breech were terminated by caesarean section.

DISCUSSION

In our study, a total of 1448 pregnant women delivered during the study period between August 2017 to October 2017. We comprehend from our study, that 910 women had Vaginal Delivery contributing to 62.9% and 538 women had Caesarean Delivery and the overall Caesarean section rate was 37.1%.

The C section rate in our study (37.1%) was higher than WHO criteria of 15% C-Section rate, Australia (28%), Tasmania (33%), USA (27%) C Section rate. Asian countries had C section rate of 27.3%.[8] The C section rates are reported as 20-25% in United Kingdom, 40% in China. In India the C section rate increased from 20 to 30% over the last 20 years and in some facilities, it is up to 35-40%.[8]

According to the Indian council of medical research (ICMR) TASK FORCE study, the C section rate has increased to 28.1% in 2005-06, that was 21.8% in 1993-94.[9]

Sl. No.	Study	C Section Rate
1	Keisuki & Tanaka et al Australia 2017	23.5%
2	Prameela et al, Mysore 2013	25.8%
3	Whogs 2004-2008 survey	26.4%
4	Tapia V et al, Peru 2016	27%
5	Gomathi E et al 2018	30.84%
6	WHO MCS 2010-11 Survey	31.2%
7	Dhodapkar et al 2015	32.6%
8	Fathima et al, Telangana 2016	37.3%
9	Patel RV et al, 2014	40%
10	Samba A et al, Ghana	46.9%
11	Our Study	37.1%

Table 5. The C-Section Rate Compared to Various Studies

The C section rate in our study is almost similar to C section rate by Fathima et al (37.3%) but higher than GOMATHI E et al, 2018 (30.84%).

The largest contribution to C section rate in our study was by Group 5 that is 38.9% of overall C section rate and Group 5 also accounted for 14.6% of total deliveries.

Group 5 is the largest contributor to overall C section rates in all the studies. In our study Group 5 contributed to 38.9% of overall C section rate whereas, Wanjari SA[10] in Maharashtra reported 32.8% of repeat C section, Shirsath A reported 54.5%, Kansara Vijay 46.1% and found to have largest contribution in all three HDI categories.

The C section rate in Group 5 was followed by Group 2 with a contribution of 24.5% and Group 1 with a contribution of 13.9%. These findings are similar to the study by Gomathi et al[11] whose C section rate had a descending order of Group 5 (93.2%), Group 2 (34.11%), Group 1 (23.7%). This was also similar to study by Fathima et al,[8] but differing from studies of Dhodapkar et al,[9] 2015, Prameela RC et al,[12] 2015, Shirsath A[13] et al, 2014, Kansara V et al,[14] 2014, Lancet study who had the prevalence of C section rate in the descending order of Group 5, Group 1 and Group 2.

Group	Our Study at Visakhapatnam	Prameela et al, Mysore	Ashmita et al, Jaipur	Fathima et al, Telangana	Gomathi et al, Karnataka
1	5.2%	5.05%	2.4%	4.34%	6.06%
2	9.1%	4.47%	6.7%	8.61%	6.21%
3	1.4%	3.20%	1.8%	0.75%	2.25%
4	2.5%	2.27%	2.8%	0.41%	0.62%
5	14.5%	8.48%	7.5%	17.5%	9.24%
6	1.8%	1.05%	1.8%	0.82%	0.85%
7	1.2%	0.59%	1.8%	0.68%	1.08%
8	0.4%	0.12%	0.7%	0.62%	0.54%
9	0.4%	0.22%	0.4%	0.48%	0.31%
10	0.5%	0.33%	5.9%	3%	3.65%

Table 6. Comparison of Group Wise Rate of C Section in Total Deliveries

In our study, it was observed that C section rate was higher in Group 2 than in Group 1 i.e. C section rate was higher in women whose labour was induced compared to similar women who went into spontaneous labour. As the commonest indication for induction of labour was post dates in our hospital, limiting induction of labour for which there is no clear indication, especially those with an unfavourable cervix would have a significant effect on the C section rate.[4] Hence in low risk women it is better to modify our procedure of induction for post dates and to adhere to the policy of induction after 41 completed weeks and routine induction not to be performed before then.

In the present study, women in group 3 and 4 i.e. multiparous women whose labour was spontaneous or induced or C section prior to the onset of labour in singleton cephalic at 37 weeks or more also had a C section rate of

10.7%. As in group 5, 99% of the women have undergone repeat C section, measures should be taken to encourage Trial of labour after C section (TOLAC) in suitable cases. Adequate spacing of at least 3 years following C section, by motivating women for postpartum Intrauterine contraceptive device at the time of C section and assist women to make an informed choice to have vaginal birth after C section, would gradually reduce the C section rate. Increasing C section rate in Group 6 and Group 7 i.e. in Nulliparous and Multiparous women with single breech pregnancy of 5.01% and 3.4% respectively can be reduced by offering external cephalic version to all eligible women with breech presentation and considering vaginal breech delivery.

It is rather an alarming fact to know that even preterm deliveries in group 10, are not being left behind and occupy 1.3% of total C section rate in our study. The last category is occupied by Group 8 and 9 which account for 1.1% each of overall C section rate.

CONCLUSION

There is a steady increase in the C section rate all over the world in the past two decades. The worldwide rise in C section rate is a major public health concern and cause of considerable debate due to potential maternal and perinatal risk, cost issues and inequity in access.[15,16]

The C section rate in our study was 37.1% and largest contributor was group 5 accounting for 14.5% of the overall 37.1% C section rate. The second largest contributor was group 2 with a C section rate of 9.1% and followed by Group 1 with a C section rate of 5.1% of the total C section rate.

Robson's 10 group classification enables us not only to understand the different obstetric groupings but also to monitor changes overtime at one facility as well as being able to compare practices between facilities.[4]

Having implemented the Robson's classification and identified groups which contributed the most to the C section rate, certain interventions can be proposed to reduce the primary C section rate as well as overall C section rate.

Thus, certain interventions like reducing C section in nulliparous women particularly by reducing number of elective C sections in these women and encouraging vaginal birth after C section in multiparous women,[17] encouraging external cephalic version in breech delivery, improved case selection for induction of labour and pre-labour C section could also reduce C section rate

In the absence of clear evidence of improved maternal and neonatal morbidity with increasing C section, all efforts should be made to optimize the C section rate. Thus, Robson's classification helps us to identify specific obstetric population to target the interventions to reduce the C section rates.

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REFERENCES

[1] Pandey D. Robson's criteria: an emerging concept. Open Access Journal of Gynecology 2017;2(2).
[2] Vogel JP, Betrán AP, Vindevoghel N, et al. Use of the Robson classification to assess caesarean section trends in 21 countries: a secondary analysis of two WHO multicountry surveys. Lancet Global Health 2015;3(5):e260-e270.
[3] Patel RV, Gosalia EV, Deliwala KJ, et al. Indications and trends of caesarean birth delivery in the current practice scenario. Int J Reproduction Contraception Obstetrics Gynecology 2014;3(3):575-580.
[4] Tanaka K, Mahomed K. The ten-group classification: a single center approach identifying strategies to optimise caesarean section rates. Obstetrics and Gynecology Interventional 2017;2017:1-5.
[5] Fatusic J, Hudic I, Fatusic Z, et al. Caesarean section rate analysis in University Hospital Tuzla - according to Robson's classification. Med Arch 2016;70(3):213-216.
[6] Reddy AV, Dalal A, Khursheed R, et al. Robson ten group classification system for analysis of caesarean sections in an Indian hospital. Research Journal of Obstetrics and Gynaecology 2018;11(1):1-8.
[7] Robson M, Murphy M, Byrne F. Quality assurance: the 10-group classification system (Robson classification), induction of labour and caesarean delivery. Int J Gynaecol Obstet 2015;131 Suppl 1:S23-S27.
[8] Fathima N. An analysis of caesarean section rate by Robson's ten group classification system to understand which groups to be targeted- A district level hospital based study. International Journal of Contemporary Medical Research 2016;3(3):712-715.
[9] Dhodapkar SB, Bhairavi S, Daniel M, et al. Analysis of caesarean sections according to Robson's ten group classification system at a tertiary care teaching hospital in South India. International Journal of Reproduction, Contraception, Obstetrics and Gynecology 2015;4(3):745-749.
[10] Wanjari SA. Rising caesarean section rate: a matter of concern? International Journal of Reproduction, Contraception, Obstetrics & Gynaecology 2014;3(3):728-731.
[11] Gomathy GE, Radhika K, Kondareddy T, et al. Use of Robson classification to assess caesarean section trends in tertiary hospital. International Journal of Reproduction, Contraception, Obstetrics and Gynecology 2018;7(5):1796-1800.
[12] Prameela RC, Farha A, Bhanumati PM, et al. Analysis of caesarean section rate in a tertiary hospital-according to Robson's 10 group classification system (TGCS). IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) 2015;14(2):46-49.
[13] Shirsath A, Rishud N. Analysis of caesarean section rate according to Robson's 10 group classification

system at a tertiary care hospital. Int J Sci Res 2014;3(1):401-402.
[14] Kansara V, Patel S, Aanand N, et al. A recent way of evaluation of caesarean birth rate by Robson's 10 group system. J Med Pharmaceutical Allied Sciences 2014;1:62-70.
[15] Samba A, Mumuni K. A review of caesarean section using the ten-group classification system (Robson Classification) in the Korle-Bu teaching hospital, (KBTH), Accra, Ghana. Gynaecol Obstet 2016;6:385.
[16] Tapia V, Betran AP, Gonzales GF. Caesarean section in Peru: analysis of trends using the Robson classification system. PLoS One 2016;11(2):e0148138.
[17] Nakamura-Pereira M, do Carmo Leal M, Esteves-Pereira AP, et al. Use of Robson classification to assess cesarean section rate in Brazil: the role of source of payment for childbirth. Reprod Health 2016;13(Suppl 3):128.