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Research Article

Analysis of caesarean delivery rates using the ten group classification system in a tertiary care hospital

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ABSTRACT

Background: With the increasing safety of operative delivery the caesarean section rates have been increasing steadily over the last 60 years both in the developing countries and the developed world. However efforts to analyse the rates and identify preventable causes are difficult as most units report only the overall caesarean section rates. This retrospective study was undertaken to analyse the indications for caesarean delivery in a one year period from January 1st to December 31st 2014 using the Robson's ten group classification system to identify CS rates in each of the separate groups.
Methods: All patients who delivered between 1st January 2014 to 31st December 2014 were identified based on the parturition register and their case records were analysed for risk factors, intra-partum events, mode of delivery and the indications for caesarean section. These were classified according to the ten group classification system.
Results: Caesarean section rate was 41.5% in this period. The CS rate was lowest in Group 3 - 11.97% and 100% in Group 9 (Transverse lie). Group 5 (Previous CS) made the greatest contribution (42.77%) to the total number of CS. Analysing these rates could make comparisons over time and from different centers.
Conclusions: Strategies to reduce the CS rate should be concentrated on Group 1 and Group 2. These include a relook at definition of abnormal first stage, standardization of abnormal FHR tracings, strict policy on induction of labour and protocols for trial of labour in previous CS.

Keywords: Caesarean section rate, Ten group classification

INTRODUCTION

With the increasing safety of operative delivery, the caesarean section rates have been increasing steadily over the last 60 years both in the developing countries and the developed world. The obstetric care consensus developed jointly by the American college of obstetrics and gynaecology (ACOG) and society for Maternal Fetal Medicine reported that in 2011, 1 in 3 women who gave birth in the US did so by caesarean delivery.[1,7,8,9] A study done by ICMR showed a caesarean section rate of 13.8 % in teaching hospitals in India This had gone up to 25.4% by 1998-99. In a study over a two year period in urban India, the CS rates were reported as 20 % and 38% in the public and private sectors respectively. A report by Sreevidhya and Sathiyasekeran showed an alarming rate of 47% in the private sector. There is also a wide variation in the rates across the different states in the country.[2,4]

Although various guidelines including those issued by the World health organization suggest that the optimum caesarean section rate is around 15%, there seems to be little effect on the rising trend.

This study was done in is a teaching hospital in south India with a moderately busy obstetric unit with 2500-3000 deliveries per year. We are involved in the teaching

of undergraduate and postgraduate students as well as nursing students. It also acts as a referral centre for high risk patients from the surrounding areas.

Analysis of the caesarean section rates is a part of the monthly audit of performance indicators carried out in the Department. The caesarean section (CS) rates over a 5 year period were as follows:

- CS Rate
- 2010:37.8%
- 2011:41.2%
- 2012:37.2%
- 2013:38.2%
- 2014:41.5%

Most obstetric units report only their overall caesarean section (CS) rates. These are not very useful to identify the cohort of women who could have had corrective intra-partum interventions to modify the CS rates.

This retrospective study was undertaken to analyse the indications for caesarean delivery in a one year period from January 1st to December 31st 2014. Women were classified using Robson's ten group classification system to identify CS rates in each of the separate groups.[3-6]

METHODS

Approval from Institutional human ethical committee was obtained (IHEC Project No: 15/071) for a retrospective observational study. All patients who delivered between 1st Jan 2014 to 31st Dec 2014 were identified based on the parturition register and their case records were analysed for risk factors, intra-partum events, mode of delivery and the indications for caesarean section. These were classified according to the ten group classification system. This classification was used:

- To identify the group of patients with increased rate of caesarean delivery
- Help in the audit process so that trends in caesarean section rates can be monitored over time
- Analysis of the low risk cohort of women (e.g.: Group 1) who are amenable to intra-partum change in protocols to reduce CS rate.

RESULTS

The number of deliveries for the one year period from Jan 1st to Dec 31st 2014 was 2500. The number of CS during this period was 1038 giving an overall rate of 41.5%. These patients were classified according to the ten group classification system as shown in Table 1.

Table 1: Robson's Ten group classification.[3,5,6]

Group	Description
Group 1	Nulliparous, single cephalic, ≥ 37 weeks, in spontaneous labour
Group 2	Nulliparous, single cephalic, ≥ 37 weeks, induced (including prelabour CS)
Group 3	Multiparous (excluding previous CS), single cephalic, ≥ 37 weeks, in spontaneous labour
Group 4	Multiparous (excluding previous CS), single cephalic, ≥ 37 weeks, induced (including prelabour CS)
Group 5	Previous CS, single cephalic, ≥ 37 weeks
Group 6	All nulliparous breeches
Group 7	All multiparous breeches (including previous CS)
Group 8	All multiple pregnancy (including previous CS)
Group 9	All transverse / oblique lie (including previous CS)
Group 10	All preterm single cephalic, <37 weeks, including previous CS

Table 2 and 3 show the number of deliveries and its percentage in each of the ten groups. The CS rate was lowest in Group 3 - 11.97% and 100% in Group 9 (Transverse lie).

We analyzed the indications for CS in the first four groups and the results are shown in Table 4. Fetal distress and dystocia were the two major indications for CS in all the groups

Table 5 shows the contribution made by each group to the overall CS rate.

Table 2: Number of deliveries and its percentage in Group 1 to 5.

	Group 1 N=490		Group 2 N=609		Group 3 N = 376		Group 4 N = 287		Group 5 N = 453	
Mode of delivery	**No. of deliveries**	**%**	**No. of deliveries**	**%**	**No. of deliveries**	**%**	**No. of deliveries**	**%**	**No. of deliveries**	**%**
Normal and Instrumental	352	71.84	406	66.67	331	88.03	236	82.23	9	1.99
CS	138	28.16	203	33.33	45	11.97	51	17.77	444	98.01

Table 3: Number of deliveries and its percentage in Group 6 to 10.

	Group 6 N = 28		Group 7 N = 18		Group 8 N = 18		Group 9 N = 12		Group 10 N = 209	
Mode of delivery	**No. of deliveries**	**%**	**No. of deliveries**	**%**	**No. of deliveries**	**%**	**No. of deliveries**	**%**	**No. of deliveries**	**%**
Normal and instrumental	2	7.14	4	22.22	7	38.89	0	0.00	115	55.02
CS	26	92.86	14	77.78	11	61.11	12	100.0	94	44.98

Table 4: Indications for caesarean section in each group.

Indication	Group 1		Group 2		Group 3		Group 4	
	No. of CS	**%**	**No. of CS**	**%**	**No. of CS**	**%**	**No. of CS**	**%**
Fetal distress	65	47.1	72	35.5	12	26.7	25	49.0
Dystocia	45	32.6	123	60.6	12	26.7	18	35.3
APH	9	6.5	2	1.0	8	17.8		0.0
PIH	2	1.4	2	1.0	3	6.7	2	3.9
Maternal wish	13	9.4	3	1.5	5	11.1	2	3.9
Others	4	2.9	1	0.5	5	11.1	4	7.8

Table 5: The contribution made by each group to the overall CS rate.

Group	Size of the group	No. of CS	% of total CS (1038)
Group 1	490	138	13.29
Group 2	609	203	19.56
Group 3	376	45	4.34
Group 4	287	51	4.91
Group 5	453	444	42.77
Group 6	28	26	2.50
Group 7	18	14	1.35
Group 8	18	11	1.06
Group 9	12	12	1.16
Group 10	209	94	9.06

DISCUSSION

The rapid increase in Caesarean delivery rate throughout the world has become a serious public health issue. The proportion of CS to total births is one of the important indicators of the availability of obstetric care (WHO 2009). Various guidelines including those issued by WHO suggest that the optimum CS rate is around 15%. Figures below 5% imply that a substantial proportion of women do not have access to surgical obstetric care. Rates higher than 15% probably indicate over utilization of the procedure for flimsy indications. Many studies have found that a higher CS delivery rate does not necessarily improve maternal or fetal outcome.[1,11]

Robson proposed a new classification system to allow critical analysis according to the characteristics of the pregnancy. The characteristics used are:

- Single or multiple pregnancies
- Nulliparous, multiparous or multiparous with a previous CS
- Cephalic, breech presentation or other malpresentation
- Spontaneous or induced labour
- Term or preterm births.

We classified patients who delivered in the study period found that the number of patients were largest in Group 1 (N = 490) and 2 (N = 609) out of 2500 deliveries. The nulliparous patient with a single cephalic presentation at term is the largest group in any obstetric unit and any change in protocols can bring about significant change.[10,14,15] Group 5 (Previous CS) made the greatest contribution (42.77%) to the total number of CS. Analysing these rates could help make comparisons over time as well as from different centers.

Analysis of the indications for caesarean section was done in Groups 1 to 4. Fetal distress and Dystocia were the two major indications in all four groups. Maternal wish was also the indication for 9.4% in Group 1 and 11.1% in Group 3.[13]

Strategies to reduce the CS rates should be planned in every obstetric unit. Many studies have shown that increasing caesarean section rates do not necessarily improve maternal or fetal outcomes. Caesarean section increases the duration of hospital stay, need for blood

transfusion and increases the risk of anesthetic complications like thromboembolism and surgical site infections. As the number of caesarean sections increase, the risk of bladder injury and morbidly adherent placenta increase with serious maternal morbidity and even mortality.

Efforts to reduce the CS rate can be concentrated on the largest groups that are group 1 and 2. Patients in Group 1 and 2 can be audited together. The CS Rate in this group depends on management protocols in the unit, the policy for induction especially postdated pregnancy and how long to wait before diagnosing labour dystocia. A relook at the definition of abnormally progressing 1st and 2nd stages of labour has been suggested.[16,17]

There have been recent reports in which investigators have been reassessed the traditional Friedman's labour curves. Zhang and associates studied the labour records of more than 62,000 parturients and found than in normal labour, progress from 3 to 5 cm and from 5 to 6 cm may take longer than Freidman's curves and progress is rapid only after 6 cm dilatation.

Efforts should be made to standardize interpretation of intrapartum CTG as categories 1 to 3. Methods of intrauterine resuscitation like stopping oxytocin and amnioinfusion for variable deceleration can be tried.

Every unit should plan protocols for labour in patients with previous CS. These patients made the largest contribution to the total number of caesarean sections (42.77%) in our study. Appropriate selection of patients and counseling in the antenatal period can increase the number of patients who undergo Trial of labour after caesarean (TOLAC). Successful vaginal birth after ceasarean increases the confidence of both the patient and the obstetric team.

Maternal wish formed the indication for about 10% of patients. The two main reasons for this was the desire to choose the time of birth and fear of the pain of labour. Antenatal counseling regarding the advantages of vaginal birth and liberal use of epidural analgesia could help in these situations. Robson recommended that Group 6,7,8,9 and 10 should not be targeted in trying to reduce the caesarean section rate. The relative risks are too high for minimal reduction in the numbers.

CONCLUSION

A close look at the caesarean section rates is the responsibility of the professional, policy makers and society at large. Any strategy to reduce caesarean section rates require proper information and classification. Using the Robson's 10 group Classification system helps divide Obstetric patients based on parity, presentation and onset of labour whether spontaneous or induced. This helps to identify the group of patients who would benefits by intrapartum strategies to reduce the caesarean section rates.

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