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AN ANALYSIS OF CAESAREAN SECTION RATES USING ROBSON CLASSIFICATION IN GENERAL HOSPITAL SUNDARI MEDAN IN 2019

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Abstract
This study aimed to determine the CS rates based on Robson Classification in General Hospital Sundari Medan in 2019. A cross-sectional descriptive study was performed in 831 medical records of women delivered through CS and 1211 women with spontaneous vaginal delivery in General Hospital Sundari Medan in 2019. Using Robson classification can determine and analysis CS rates in 2019. Then, distribution data of CS patients using statistical software was done. In this study found that overall CS rates in General Hospital Sundari was 40.70%. Three largest contributors to group size CS in Robson Classification were group 3 (33.84%), group 1 (18.9%), and group 9 (16.31%). Meanwhile, largest contributors to group CS rate of Robson Classification were group 5,6,7, and 9 (100.00%). Through implementation of the Robson Classification, we identified high preterm high-risk pregnancies and high previous CS cases in General Hospital Sundari in 2019.

Keywords: caesarean section, Robson, Classification, groups

I. INTRODUCTION

One of the most important decision in obstetrics is when to decide to initiate a pregnancy before spontaneous labor begins. The decision may be whether to induce labor or a pre-labor caesarean section (CS).[1] The rate of CS has steadily increased throughout the world over the last few decades in both developed and developing countries.[2-4] Results from the Indonesian Demographic and Health Survey recorded that the number of CS in 1997 amounted to 4.3% of the total deliveries, and this figure has increased to 22.8% in 2007.[5] When compared to other countries in Asia, this figure is quite high.2 In 2013, Riskesdas noted that CS births were 9.8% of the total 49,603 births in 2010 until 2013 with the highest percentage in DKI Jakarta (19.9%) and the lowest in Southeast Sulawesi (3.3%).[6]

There are many factors that influence the increasing number of CS. These factors include the advancement of surgical and anesthetic techniques and procedures, increased economic status, reduced risk and postoperative complications, changes in the health care system, and increased awareness of patients in determining their own preferred delivery method. CS will increase maternal morbidity (2%), the need for blood transfusions (0.4%), the rate of hysterectomy (0.1%), the length of hospital stay (0.7%), the rate of care in the intensive care unit to maternal mortality (0.2%). In addition, it will also increase the neonatal mortality rate, the rate of care in neonatal care units, and the delivery rate for premature babies indirectly.[7,8] Therefore, this is a public health problem worldwide.[3]

Reducing maternal and infant morbidity and mortality is one of the goals promoted by WHO for 2030. One of the recommended ways to fulfill this goal is to prevent clinically unnecessary CSs.[9] However, the

challenges are to keep CS rate low while ensuring safe outcomes for both mothers and babies.[8,10] One of the main difficulties was the lack of a classification tools that would be feasible to used internationally, to enable audit feedback and establish optimal CS rates in different countries.[2,11] A standardized, reliable classification system to monitor and compare CS rates in consistent and action-oriented manner is needed. Ideally, such system should be simple, clinically relevant, accountable, replicable and verifiable. Such a classification system should be internationally applicable and useful for clinicians and public health authorities.[12-14]

During last decades, several classification systems for CS have been developed and proposed for different purposes.[12] Among these classification systems, there is one system that classifies CS based on obstetric characteristics and was introduced by Robson *et al.* in 2001.[2,13] This system is conceptually easy, has clearly defined categories that are truly inclusive, mutually exclusive, and has only a little misunderstanding or misclassification. All information is easily obtained from medical records. This system can be easily implemented in areas with high and low resources.[12]

Based on previous statement, the researchers interested to analyze the CS rates using Robson Classification in General Hospital Sundari Medan in 2019.

II. RESEARCH METHODOLOGY

Sample selection

This descriptive research with cross-sectional approach was conducted in Sundari General Hospital Medan. This study was done from January 2019 until December 2019, after receiving approval from Health Research Ethics Committee, Medical Faculty, Universitas Sumatera Utara.

These study samples were all patients' medical records with previous CS in Sundari General Hospital Medan. Samples were gathered by using consecutive sampling technique. The inclusion criteria were all medical records from previous CS nulliparous and multiparous women; all medical records from previous CS women with ≥37 weeks gestation and ≤36 weeks gestation; and all medical records from single cephalic, breech, transverse or oblique lie pregnancy and also multiple pregnancies with previous CS. Exclusion criteria for this study was incomplete medical records.

In this study, Robson Classification to analyze CS rate was used. In this classification, there were 10 Robson groups, which were described as: group 1 (nulliparous women with single cephalic pregnancy, ≥37 weeks gestation in spontaneous labour), group 2 (nulliparous women with single cephalic pregnancy, ≥37 weeks gestation who either had labour induced or were delivered by CS before labour), group 3 (multiparous women without previous uterine Scar, with single cephalic pregnancy, ≥37 weeks gestation in spontaneous labour), group 4 (multiparous women without a previous uterine Scar, with single cephalic pregnancy, ≥37 weeks gestation who either had labour induced or were delivered by CS before labour), group 5 (all multiparous women with at least one previous uterine Scar, with single cephalic pregnancy, ≥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 a single pregnancy with a transverse or oblique lie, including women with previous uterine Scars), and group 10 (all women with a single cephalic pregnancy <37 weeks gestation, including women with previous Scars).

III. RESULTS AND DISCUSSIONS

In this study, 831 medical records from patients undergoing CS in Sundari General Hospital Medan were obtained. Table 1 showed the characteristics of study subjects based on Robson criteria.

Table 1 The characteristics of study subjects based on Robson Criteria

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Robson Classification Groups	Number CS per group	Number women per group	Group size (%)	Group CS rate (%)	Absolute contribution to the CS rate (%)	Relative contribution to the CS rate (%)
1. Nulliparous, single cephalic pregnancy, ≥ 37 weeks, spontaneous labour	0	386	18,9 %	0,00%	0,00%	0,00%
2. Nulliparous, single cephalic pregnancy, ≥ 37 weeks, induced labour or CS before labour	97	150	7,35 %	64,67 %	4,75%	11,67%
3. Multiparous without previous uterine scar, single cephalic pregnancy, ≥37 weeks, spontaneous labour	0	691	33,84 %	0,00%	0,00%	0,00%
4. Multiparous without previous uterine scar, single cephalic pregnancy, ≥37 weeks, induced labour or CS before labour	32	60	2,94 %	53,3 %	1,57%	3,85%
5. Multiparous with at least 1 previous uterine scar, single cephalic pregnancy, ≥37 weeks	72	72	3,53 %	100,00%	3,53%	8,66%
6. Nulliparous, single breech pregnancy	76	76	3,72 %	100,00%	3,72%	9,15%
7. Multiparous, single breech pregnancy, including women with previous uterine scars	142	142	6,95 %	100,00%	6,95%	17,09%
8. Multiple pregnancies, including women with previous uterine scars	0	0	0%	0,00%	0%	0,00%
9. Single pregnancy with a transverse or oblique lie, including women with previous uterine scars	333	333	16,31 %	100,00%	16,31%	40,07%
10. All women with a single cephalic pregnancy <37 weeks gestation, including women with previous scars	79	132	6,46 %	59,85 %	3,87%	9,51%
Total	831	2042	100%	40,70 %	40,70%	100,00%
Total obstetric population	Number or total CS	Number total labour	100%	Overall SC rate	Overall SC rate	100%

There are 9 steps in processing audit rate of CS. The first step is to determine CS rate in group 1 (column 5). In this study, we found 0.00% in this group (according to reference value <10%). This signified that Sundari Hospital is a secondary health facility. There were too many referral cases requiring CS to be

performed in the hospital. Second step is to assess CS rate in group 2. This study found 64.67%, which was higher than reference value (20-35%). Value of >35% indicated that there are too many planned CS. There was a possibility that the data is inaccurate, so it is necessary to review the medical record again. The third step is to evaluate CS rate in group 3. This study showed 0.00% which was in line with reference value (≤3%). After that, the 4th step is to determine CS rate in group 4. In this study, we found about 53.3%, which is higher than reference value (<15%). High rate of CS in this group may reflect high demand for CS even if their first labour was vaginal delivery. This may be due to previous traumatic birth or prolonged labour or the need for tubal ligation.

Then, the next step is to assess the CS rate in group 5. This study found 100.00% (higher than reference value 50-60%). As the value of this study is higher than the reference value, there may be an increase in CS schedule before labour and the management VBAC in group 5 needs to be reviewed. The sixth step is to determine CS rate in group 8. This study found 0.00% (which is line with reference value </60%). Seventh step is to evaluate CS rate in group 10. This study found about 59.85% (higher than reference value 30%). If >30%, this meant that there are many high-risk pregnancy cases (for example fetal growth restriction and preeclampsia) who will need preterm SC pe-labour. The next step is to assess relative contribution to the CS rate in group population 1,2, and 5. These groups contributed about 2/3 (66%) of all CS in this study. These groups should be main concern if the hospital wants to reduce overall CS rate. This study found that there are 20.33%. This meant that rate CS for these groups were still good because <66%. The last step is to determine overall CS rate in group 5. If it is too high, this means that there are increase in CS percentage in group 1 and 2 years before. In this study, obtained a value of 8.66%. This value is not so high. After the analysis, identification and root of problem were known (Table 2).

Table 2. Identification and root of problem

Area	Identification of problem	Root of problem	Statement for root of problem
Policy	High preterm high-risk pregnancies	Too young, lack of education of pre-pregnancy, high rate of pregnancy before marriage	High rate of pregnancy before marriage
Hospital services/ management	High previous CS cases, high preterm high- risk pregnancies	High previous CS years before, high cases of high-risk pregnancies ended up with CS, late ANC screening, measuring instrument for patient identification at primary phase health facility is not yet uniform	Instrument for patient identification at primary phase health facility is not yet uniform
Health officer	High risk high preterm pregnancy	Lack of education about pre-conception, still no procedures about pre- conception education	Lack of education about pre-conception, still no procedures about pre- conception education
Patients & family	High risk high preterm pregnancy	Lack of education about high-risk pregnancies, education from health officers	Lack of health officers' education, lack of education about high-risk pregnancies

This study showed that overall CS rate in Sundari Hospital was 40.7%. Then, based on Robson classification, we also found that highest CS rate were in group 5, 6, 7, and 9 (100%) and the lowest were 1, 3, and 8. CS rate in this study was a little bit higher than Hehir et al (31.6%). This study was in line with Hehir et al who also showed that breech pregnancies (group 6 and 7) have CS rate >90%. However, their researchers found that group 3 was the most common, while group 5 increased from 27% in 2005-2006 to >34% in 2013-2014.[15]

In this study, we also found that the biggest contributor for group size for CS are group 3 (33.84%) which is followed by group 1 (18.9%), group 9 (16.31%), and so on. There is controversy from previous researchers. Tanaka et al studied about 2625 women giving birth over 12 months period who were analyzed using Robson classification. Women with previous CS (group 5) made up 10.9% of the overall 23.5% CS rate. The second largest contributor was single nulliparous women with cephalic presentation at term (5.1% of the total 23.5%).[16]

Tura et al in his study revealed that group 3, group 5, and group 1 were main contributors for overall CS in respectively 21.4%, 21.1%, and 19.3%. Three main indications for CS are fetal disorders (especially fetal distress), obstructed labour (especially cephalopelvic disproportion) and prior CS. Fetal compromise, obstructed labour and previous CS are the underlying indications for performing CS.[8] The use of Robson classification is increasing rapidly and spontaneously around the world. Despite some limitations, this classification is easy to implement and interpret.[2]

IV. CONCLUSION

In this study, some conclusion could be emphasized. Overall CS rate in Sundari Hospital was 40.70%. Three largest contributors of Robson classification groups for group size CS were group 3 (33.84%), group 1 (18.9%), and group 9 (16.31%). The largest contributors for group CS rate were group 5,6,7,9 (100.00%).

Based on analysis about Robson classification report results, high preterm high-risk pregnancies and high previous CS cases in Sundari Hospital in 2019 was found.

V. CONFLICT OF INTERESTS

The author has no financial interests relevant to the product or company described in this article.

VI. ACKNOWLEDGMENT

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VII. ETHICAL APPROVAL

Health Research Ethical Committee, Universitas Sumatera Utara, Medan, Indonesia approved this study.

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