Review article

Combating the rising caesarean section (CS) rates in Sri Lanka using new technology

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Increasing CS rates in Sri Lanka – a cause for concern

Caesarean section rates in Sri Lanka have been increasing. National data reveals that CS rates had risen from 32.1% in 2014 to 40.8% in 2018[1]. Using joint point regression and autoregressive integrated moving average technique it is forecasted that more than half of births in Sri Lanka will occur through CS by the year 2025[2].

In 1985, the international healthcare community decided that the ideal rate for CS to be between 10% and 15%[3]. Increasing CS rates over 10% has not shown to have any impact on maternal or perinatal outcomes[4]. In fact, CS carried out without medical reasons significantly increase maternal mortality and morbidity[5]. Hence, CS need to be carried out only for medical indications.

Understanding the reasons for CS are important in assessing the necessity and in reducing unnecessary CS. To identify and evaluate reasons, accurate data collection plays a crucial role. It is recommended to have continuous data collection, processing, and interpretation. However, this is difficult to implement at most institutions and therefore often neglected.

Robson classification

The World Health Organization (WHO) systematic review in 2011 identified 27 different systems to classify CS. The review concluded that women-based classifications, and the 10-Groups Robson classification were the best classifications to categorize CS which fulfill the current needs in evaluating CS rates[6].

Robson classification is identified as a simple, robust, reproducible, and clinically relevant categorization[6]. Also Robson classification is a prospective system that increases the quality of the data collected[7]. Therefore, even before the official endorsements by international institutions or formal guidelines, WHO recommended its use in 2015[8]. The CS categories in Robson classification are shown in Table 1.

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Table 1. Robson 10 group classification with subclassifications

Robson classification group number	Characteristics of the group
1	Nulliparous women with single cephalic pregnancy, 37 weeks gestation in spontaneous labour
2	Nulliparous women with a single cephalic pregnancy, ≥37 weeks gestation who had labour induced or were delivered by CS before labour
2a	Labour induced
2b	Pre-labour CS
3	Multiparous women without a previous CS, with a single cephalic pregnancy, ≥37 weeks gestation in spontaneous labour
4	Multiparous women without a previous CS, with a single cephalic pregnancy, ≥37 weeks gestation who had labour induced or were delivered by CS before labour
4a	Labour induced
4b	Pre-labour CS
5	All multiparous women with at least one previous CS, with a single cephalic pregnancy, ≥37 weeks gestation
5a	With one previous CS
5b	With two or more previous CS(s)
6	All nulliparous women with a single breech pregnancy
7	All multiparous women with a single breech pregnancy including women with previous CS(s)
8	All women with multiple pregnancies including women with previous CS(s)
9	All women with a single pregnancy with a transverse or oblique lie, including women with previous CS(s)
10	All women with a single cephalic pregnancy < 37 weeks gestation, including women with previous CS(s)

Data collection

It is important to collect data continuously, analyze and interpret meaningfully to look at the trends and to propose solutions for reducing CS rates. Up to date data will be crucial in looking at different strategies implemented and their outcomes. We are currently lagging our national statistics with current latest rates on national data base is for the year 2018.

Traditionally continuous data collection is time consuming. All around the world studies on CS rate classification according to Robson criteria is done looking at retrospective data bases. Even in countries with electronic patient record systems find prospective data collection challenging. In Sri Lanka, currently there are no electronic data recording systems in place. Most units do not employ secretaries for data handling. Therefore, continuous data collection according to Robson classification is impractical with the current infrastructure.

Challenges in implementing Robson classification

We found only one published study which had followed Robson protocol in a Sri Lankan setting. Senanayake at el. conducted a prospective study in the University Unit De Soysa Hospital for Women (DSHW) from July 2015 to June 2017. The orthodox data collection methods used in the study needed many resources, and the study was non-sustainable on the long run. Senanyake et al study was discontinued in 2017 at university unit DSHW due to this limitation.

In many studies using Robson classification, missing data, misclassification of women, and lack of definition or consensus on core variables of the classification were the main challenges[9]. When the information on one or more of the core variables is missing or illegible in the patient record, quality of final database is affected. This is one of the drawbacks in categorizing according to Robson classification. The quality of the data plays a crucial role in categorizing CS in a meaningful manner. Robson manual has given guidance for assessing the quality of gathered data especially focusing on the aspect of missing data[9].

App based data collection and analysis

We find paper-based data collection is not practical if the aim is to collect and analyse data concurrently of all the child births at a unit. Therefore, we suggest the use of a smart phone application for data collection and analysis.

RobsApp®, a WebApp for data collection and analysis

RobsApp® is a smartphone based WebApp designed to run on any device thus ensuring the principles of BYOD (Bring Your Own Device) computer usability principle. Application comprises only 1 page and all the functionality is limited to two events namely data saving and data analysis (Figure 1 and 2). The application was validated for the use of data collection for Robson classification. (Article in press) Use of RobsApp® is easy and therefore we believe that it can be a solution for continuous data collection. Data entering time was about 2 minutes per patient which significantly reduced the time and resources needed for data collection and handling.

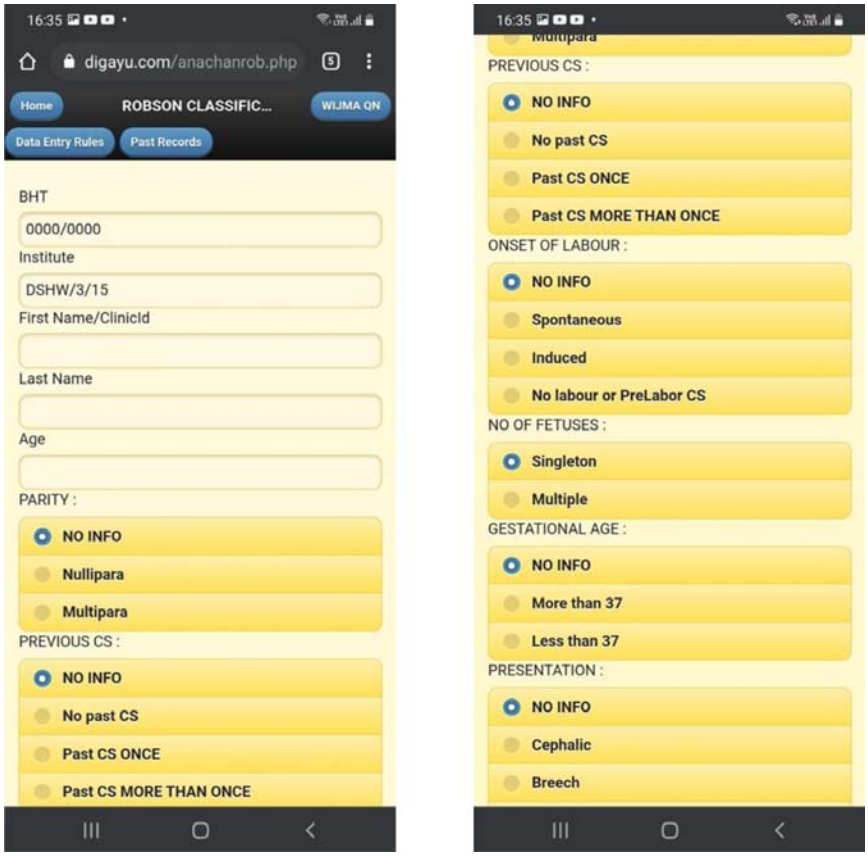

Figure 1. **Screen shots of the RobsApp® data entry format.**

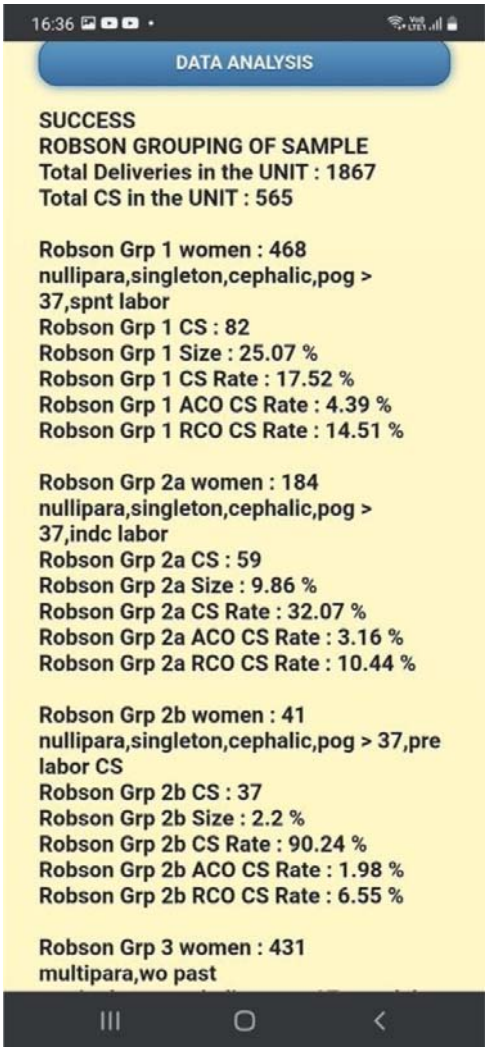

Figure 2. **Screenshot of the RobsApp® data analysis interface.**

WHO multicounty survey (MCS) and Senanayake et el. used paper-based data collection, later transferring them to electronic format. These studies had not been able to achieve the Robson guidance recommended level of data quality whilst RobsApp® was able to achieve the recommended data quality. The patient information was entered at the bed side and all fields had to be filled before closing the data entry for an individual. This prevented missing data completely. Also, the application managed to reduce the data entry errors since data were automatically transferred to a database (Article in press).

Suggestions and recommendations

There are large differences in facilities even within a country. CS rates in different institutions in Sri Lanka had been reported ranging from 23.6% to 44.2%[10-12]. Dividing into level of care is one way of reducing the heterogeneity. However, even within tertiary care level depending on the referrals and available resources the patient population and care provided can be quite heterogeneous. Several reasons can be highlighted for this heterogenicity between different tertiary centers in Sri Lanka. For example, although there is a linked referral system with the primary health care facility and specialist units, the patients can bypass this system and decide where they wish to have their antenatal care and delivery. Therefore, it is more prudent to analyze data temporally in the same healthcare facility or a single unit to draw applicable recommendations.

We propose the use of RobsApp® in different institutional levels to continuously monitor their CS rates according to Robson classification. Having continuous data with real time updates will help us implement strategies and to evaluate them on a regular basis to combat rising CS rates in the country.

References

1. Lanka S. Annual health bulletin 2018. Ministry of Health [Internet]. [cited 2021 May 29]. Available from: www.health.gov.lk
2. Gunawardane D, Rowel D, Dharmaratne S. The Increasing Trend in Caesarean Section Rate: Sri Lankan scenario: 2005-2016. In: 131st Anniversary International Medical Congress of Sri Lanka Medical Association. Colombo; 2018.
3. Appropriate technology for birth. Lancet (London, England). 1985; 2(8452): 436-7.
4. Ye J, Betrán AP, Guerrero Vela M, Souza JP, Zhang J. Searching for the optimal rate of medically necessary cesarean delivery. Birth. 2014; 41(3): 237-44.
5. Lumbiganon P, Laopaiboon M, Gülmezoglu AM, Souza JP, Taneepanichskul S, Ruyan P, et al. Method of delivery and pregnancy outcomes in Asia: the WHO global survey on maternal and perinatal health 2007-08. Lancet [Internet]. 2010; 375(9713): 490-9. Available from: http://dx.doi.org/10.1016/S0140-6736(09)61870-5
6. Torloni MR, Betran AP, Souza JP, Widmer M, Allen T, Gulmezoglu M, et al. Classifications for Cesarean Section: A Systematic Review. PLoS One [Internet]. 2011; 6(1): e14566. Available from: https://doi.org/10.1371/journal. pone. 0014566

7. Betrán AP, Vindevoghel N, Souza JP, Gülmezoglu AM, Torloni MR. A systematic review of the Robson classification for caesarean section: what works, doesn't work and how to improve it. PLoS One [Internet]. 2014; 9(6): e97769-e97769. Available from: https://pubmed.ncbi.nlm.nih.gov/24892928

8. Betran AP, Torloni MR, Zhang JJ, Gülmezoglu AM. WHO Statement on Caesarean Section Rates. BJOG. 2016; 123(5): 667-70.

9. World Health Organization. Robson Classification, Implementation manual. Journal of Chemical Information and Modeling. 2019; **53**: 1689-99.

10. Markandu T. Analysis of Caesarean Sections Using Robson Classification in Teaching Hospital Batticaloa, Sri Lanka. 2020 Sep 12;

11. Goonewardene M, Kumara D, Arachchi DJ, Vithanage R, Wijeweera R. The rising trend in caesarean section rates: should we and can we reduce it? Sri Lanka J Obstet Gynaecol. 2012; 34(1): 11.

12. Senanayake H, Piccoli M, Valente EP, Businelli C, Mohamed R, Fernando R, et al. Implementation of the WHO manual for Robson classification: An example from Sri Lanka using a local database for developing quality improvement recommendations. BMJ Open. 2019; 9(2).