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MATERNAL HEALTH

Quality assurance: The 10-Group Classification System (Robson classification), induction of labor, and cesarean delivery



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ABSTRACT

Quality assurance in labor and delivery is needed. The method must be simple and consistent, and be of universal value. It needs to be clinically relevant, robust, and prospective, and must incorporate epidemiological variables. The 10-Group Classification System (TGCS) is a simple method providing a common starting point for further detailed analysis within which all perinatal events and outcomes can be measured and compared. The system is demonstrated in the present paper using data for 2013 from the National Maternity Hospital in Dublin, Ireland. Interpretation of the classification can be easily taught. The standard table can provide much insight into the philosophy of care in the population of women studied and also provide information on data quality. With standardization of audit of events and outcomes, any differences in either sizes of groups, events or outcomes can be explained only by poor data collection, significant epidemiological variables, or differences in practice. In April 2015, WHO proposed that the TGCS (also known as the Robson classification) is used as a global standard for assessing, monitoring, and comparing cesarean delivery rates within and between healthcare facilities.

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1. Introduction

One of the most important decisions in obstetrics is the decision to end a pregnancy before spontaneous labor has started. This may be for a maternal, or more commonly, a fetal reason and it may be by induction of labor or a pre-labor cesarean delivery. Likewise, if labor has started spontaneously or has been induced, it may sometimes be necessary to perform a cesarean delivery for either a fetal reason or lack of progress in labor. There is no standardized classification or methodology used for analyzing the outcome and the results of these decisions [1]. It is therefore difficult to compare results over time in one organization or between different organizations. There is often little consensus on the way we diagnose labor, the methods we use to accelerate labor, the way we monitor the fetus during labor, the indications and methods for inducing labor, or the indications for cesarean delivery.

Standardizing the way we analyze events and outcomes should be easier than standardizing the processes we use in labor and delivery. The aim of the present paper is to describe the 10-Group Classification System methodology (also known as the Robson classification) using 2013 data from the National Maternity Hospital, Dublin, Ireland [2].

2. The 10-Group Classification System

The National Maternity Hospital in Dublin is a tertiary referral hospital and one of the largest maternity hospitals in Europe. It produces an annual clinical report each year that is available for external scrutiny. Over the years, development of the methodology of audit of labor and delivery has been refined and now many other hospitals use the same principles. The National Maternity Hospital uses the 10-Group Classification System (TGCS) [3]. This system has been used extensively internationally to analyze cesarean deliveries [4,5], but it was originally designed so that all labor and delivery events and outcomes could be analyzed in the context of the different types of management that each unit may have. In addition, significant epidemiological variables could be incorporated either within the 10 groups or used to analyze the distribution of the 10 groups within different epidemiological subgroups.

The way the TGCS table is constructed and presented is important (Table 1). It is essential that there is a disciplined and standard way of interpreting the results [6]. Any particular group can only be interpreted individually in detail after first interpreting the different relative sizes of the other nine groups.

The groups are described in the first two columns. Ten groups were chosen to give some discrimination to the population; more than 10 would become difficult to remember. The different groups were chosen because of their clinical relevance and some were chosen to assist the determination of data quality. The order and relationships of the groups in the table are also important to enable rapid and easy interpretation of

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Table 1
The Ten Group Classification system for cesarean deliveries, National Maternity Hospital, Ireland, 2013.

Group	Description	2013 2024/8755 (23.1%)	Size of group, %	Cesarean delivery rate in group, %	Contribution of each group (23.1%)
1	Nulliparous, single cephalic, ≥ 37 weeks, spontaneous labor	146/2040	23.3	7.1	1.7
2	Nulliparous, single cephalic, ≥ 37 weeks, induced or cesarean before labor	468/1305	14.9	35.9	5.3
3	Multiparous (excluding previous cesareans), single cephalic, ≥ 37 weeks, spontaneous labor	31/2564	29.3	1.2	0.4
4	Multiparous (excluding previous cesareans), single cephalic, ≥ 37 weeks, induced or cesarean before labor	130/944	10.8	13.8	1.5
5	Previous cesarean, single cephalic ≥ 37 weeks	683/1003	11.5	68.1	7.8
6	All nulliparous breeches	167/178	2.0	93.8	1.9
7	All multiparous breeches (including previous cesareans)	124/138	1.6	89.9	1.4
8	All multiple pregnancies (including previous cesareans)	130/198	2.3	65.7	1.5
9	All abnormal lies (including previous cesareans)	40/40	0.5	100	0.5
10	All single cephalic, ≤ 36 weeks (including previous cesareans)	105/345	3.9	30.4	1.2

the data. All groups could be further subdivided and some groups need to be amalgamated to provide more appropriate denominators depending on what events and outcomes are being analyzed. However, the more frequently the 10 groups are used internationally, the more useful they become as a common starting point for further analysis. The third column heading provides the numerator for the total number of cesarean deliveries and the denominator for the total number of women who delivered in the institution; the column contains the numerator and denominator for the number of cesarean deliveries and women who delivered, respectively, for each group. The numbers in each group should add up to the totals at the top. The percentage of women that cannot be classified gives a reflection of data quality.

The fourth column in the table gives the size of each group as a percentage and is calculated by the number of women in each group divided by the total number of women in the population. It is remarkable how consistent the sizes are in different populations and it therefore becomes relatively easy to either question the quality of the data or indeed identify unique populations.

The fifth column provides the cesarean delivery rate in each group by dividing the number of cesareans carried out in each group by the number of women in each group.

The sixth column provides the absolute contribution of each group to the overall cesarean delivery rate. This is calculated by dividing the number of cesarean deliveries in each group by the total number of women in the population. The contribution to the overall cesarean delivery rate is influenced by the cesarean delivery rate in each group and also the size of the group. The absolute (rather than relative) rate of contribution is recommended for use in Table 1. It is then easy to quickly interpret both the absolute and relative rates of contribution to the cesarean delivery rate.

Induction rates are most often described in terms of overall rates. This is misleading as not all women can or will potentially be induced. In addition, the incidence of induction of labor varies according to different groups of women as do the indications, methods of induction, implications of inductions, and outcomes. The most significant group in this context is group 2: nulliparous women at greater or equal to 37 weeks of gestation with a single cephalic pregnancy who are induced or have a pre-labor cesarean delivery [7]. The group of women who are induced is often referred to as group 2a. The appropriate denominator for the incidence of inductions in this group is all nulliparous women at greater or equal to 37 weeks of gestation with a single cephalic pregnancy—the total of groups 1 and 2 (Table 2). Group 2 is not split initially in the

Table 2
Total single cephalic nulliparous pregnancies at greater than or equal to 37 weeks of gestation (groups 1 and 2: $n = 3345$), 10 Group Classification System, National Maternity Hospital, Dublin, 2013.

Spontaneous labor	Induced labor	Pre-labor cesarean
61.0% (2040/3345)	35.7% (1195/3345)	3.3% (110/3345)

TGCS as, paradoxically, more information can be gleaned more quickly by keeping group 2 undivided.

The same principles are applied to groups 3 and 4 to analyze induction of labor in all multiparous women at greater or equal to 37 weeks of gestation with a single cephalic pregnancy but no previous scar.

The only other groups of women that in practical terms are induced are relatively small, and because of this and their unique characteristics they should be audited completely separately. These include women in groups 5, 8, and 10.

2.1. Indications for inductions and cesarean deliveries

Indications for induction of labor, just like indications for cesarean deliveries, are becoming problematic in terms of audit as there seems to be an endless list developing, including no medical indication. These indications are often difficult to define, which leads to inconsistency in their use. The principles adopted are that some grouping of indication is required. Undoubtedly there is some overlap, but the indications are grouped according to the most significant one. Each group of indications for inductions can be analyzed in more detail, if required, to determine the particular specific indication.

The same principles are adopted for indications for pre-labor cesarean deliveries. Ideally, pre-labor cesarean deliveries should be divided into fetal, maternal, and no medical indication. However, these are difficult to define because of overlap and are therefore difficult to implement.

Finally, the indications for cesarean deliveries performed in spontaneous labor or after labor has been induced are described in Fig. 1 [1]. The principles of this classification are to distinguish between cesarean deliveries carried out for fetal reasons (no oxytocin) and cesarean deliveries carried out for dystocia (failure to progress). It uses the need for oxytocin as a distinguishing feature between fetal reasons and dystocia. It also describes the two common types of dystocic labors leading to cesarean delivery: labors progressing at less than 1 cm per hour (inefficient uterine action, IUA) and those that progress at more than 1 cm per hour initially and then subsequently fail to progress (efficient uterine action, EUA). IUA and EUA are subsequently subdivided.

For dystocia, the subdivision IUA, poor response (Dys/IUA/PR) is when oxytocin is prescribed and in theory reaches the maximum dose according to that delivery unit's guideline, but the labor fails to progress at more than 1 cm per hour. The subdivision IUA, inability to treat overcontracting uterus (Dys/IUA/ITT/OC) is when oxytocin is prescribed and is unable to achieve the maximum dose because the uterus over contracts. IUA, inability to treat, fetal intolerance (Dys/IUA/ITT/FI) is when oxytocin is prescribed and is unable to achieve the maximum dose because the fetus does not tolerate the oxytocin. Lastly IUA, no oxytocin (IUA/no oxytocin) is when there is poor progress (less than 1 cm per hour) but no oxytocin is prescribed for varying clinical reasons. Efficient uterine action (EUA) is divided into cephalopelvic disproportion/obstructed labor (EUA/CPD/obstruction) or malposition (EUA/malposition).

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