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Categorisation of Caesarean Section and Decision to Delivery Time in a Peripheral Maternity Unit

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Abstract

Aim

Classification of caesarean section is based on clinical definitions which correlate to the decision to delivery interval (DDI). The aims of this audit were to identify if categorisation is used and communicated correctly, to identify the reasons for each classification and to quantify the decision to delivery interval.

Methods

A retrospective audit of the first 48 Category one or two caesarean sections at Cavan General Hospital in 2018 was completed. The RCOG and NICE guidelines were used as standards.

Results

The indication for caesarean section was documented in all cases. Fetal distress was the most common indication for delivery (n=22, 45.8%). Categorisation documentation varied across Midwifery (n=48, 100%), Obstetrics (n=28, 58.3%) and Anaesthetics (n=15, 31.25%). The decision time was well documented (95%, n=46). The DDI was easily identified in all cases and was in line with international standards. The average time for Category one delivery (n=7, 14.5%) was 22.85 minutes (range 14-43) and 41.3 minutes for Category two (n=41, 85%) (range 11-96 minutes).

Discussion

It was evident that timely decisions were made, and good communication was noted. Decision to delivery interval times at Cavan General are in line with best practice standards. Education regarding categorisation, use of 'formal drill' and re-iterating the importance of documentation can lead to improvements in communication, maternal and neonatal outcomes.

Introduction

Categorisation of caesarean section is based on clinical definitions which correlate to the decision to delivery interval (DDI). An individualised approach to the urgency of a caesarean section is needed, however broadly speaking a DDI of under 30 minutes is viewed as an auditable standard for a maternity unit for a Category one Emergency. The categorisation of the caesarean section must be decided by either Obstetrician or Senior Midwife and the decision to proceed should be clearly documented. The category must be agreed and uniform amongst all staff including Obstetricians, Midwives, theatre staff and Anaesthetics.[1]

It is widely accepted that the traditional use of 'elective' and emergency' terms as classification of caesarean section yield very little for data collection, auditing of services and obstetric, anaesthetic and neonatal outcomes.[1] The varying degrees of emergency in obstetrics are not wholly applicable to other disciplines and so The National Confidential Enquiry into Patient Outcome and Death (NCEPOD), used widely in the UK for surgical procedures, has been highlighted as not applicable to caesarean section.[1] There have been varying classifications developed over the last twenty years, some proving useful and reliable in clinical practice such as the four-grade classification system by Lucas et al. (2000).[3] A modified version of this has been employed and encouraged by the Royal College of Obstetricians and the Royal College of Anaesthesists.[1]

The urgency classification of caesarean section is as follows: Category one, Emergency, immediate threat to life of woman or fetus such as cord prolapse or uterine rupture. Category II, Urgent, maternal or fetal compromise that is NOT life threatening such as placental abruption in the absence of maternal shock or failure to advance with pathological CTG. Category III, Semi-Elective, needs early delivery but no maternal or fetal compromise such as breech in early labour or failed induction of labour. Category IV, Elective, at a time to suit the patient and maternity services such as breech not in labour or maternal request.[1,3] It should be noted that this classification system is not a replacement for the Robson 10 Classification for caesarean section.[4]

According to NICE guidelines, DDI for Category one is 30 minutes and between 30 and 75 minutes for Category two.[2] The UK 'sentinel' caesarean section audit suggested that emergencies such as cord prolapse should have a DDI of 15 minutes.[5] A DDI of 30 minutes as a target for fetal compromise is a useful tool that enables the entire multidisciplinary team to be educated, informed and audited against. Despite this, it is important to note that certain clinical scenarios will necessitate a DDI of much less than 30 minutes and all clinicians should be aware of these cases. In addition, there must be an understanding that unnecessary haste or speed to achieve a certain DDI can pose risks from anaesthetic, obstetric and neonatal perspectives.[1,2]

The importance of communication must not be underestimated and is at the core of safe delivery and good maternal and neonatal outcomes. All members of the team should be informed of the need or potential need for caesarean section as soon as is clinically possible.

The categorization of the caesarean section is paramount within this communication, to highlight the degree of urgency.[1] Correctly identifying the category of delivery enables all members of the team to understand the clinical scenario, communicate efficiently and complete their designated tasks safely and in a time-sensitive manner.[1]

The purpose of this Audit was to assess if categorisation is used and communicated correctly, the reasons for each classification and to quantify the decision to delivery interval.

Methods

This was a retrospective chart review of the first 48 Category one or Category two Caesarean Sections completed at Cavan General Hospital in 2018. A predefined proforma was used and the RCOG and NICE Guidelines were adhered to.

Study Protocol

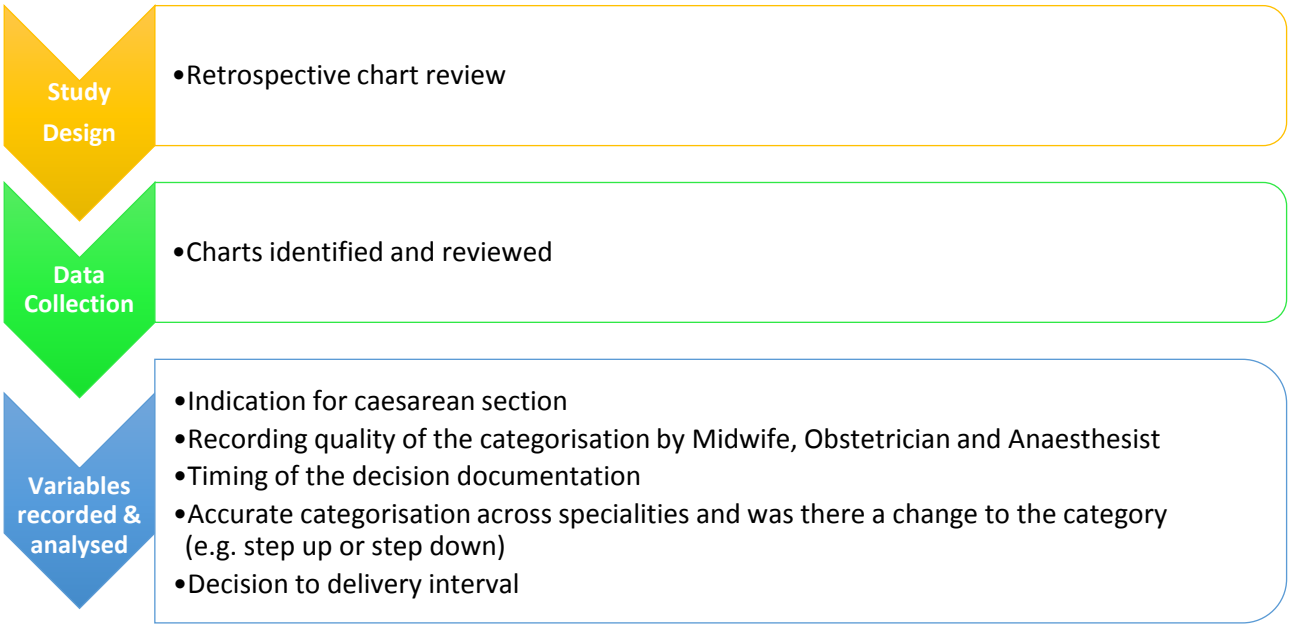

Figure 1: *Study design.*

Study Measures

The variables examined included the indication for caesarean section, the recording quality of the categorisation by Midwife, Obstetrician and Anaesthetist, timing of the decision documentation, accurate categorisation across specialities, was there a change to the category (e.g., step up or step down) and the decision to delivery interval.

Data analysis

All data was collected in an anonymized fashion and Excel was used for analysis.

Results

The indication for caesarean section was recorded each time (100%). This is depicted below in Table 1.

Table 1: *Indication for caesarean section.*

Indication for LSCS	Times cited as indication	% of cases
Abruption	1	2
Failed IOL	4	8.3
Failed instrumental delivery	3	6.25
Failure to advance/ progress	14	29
Fetal distress	22	45.8
Sepsis	1	2
>1 reason	10	20.8
Other	9	18.7

For deliveries with greater than one indication, fetal distress was the most commonly cited reason (n=6, 12.5%).

Table 2: *Breakdown of indications labelled as 'Other'.*

Indication for LSCS 'Other'	Times cited as indication	% of cases
Meconium Grade II	1	2
Placenta praevia with bleeding	2	4
Breech in labour	2	4
Non-substantial antepartum haemorrhage	1	2
Prior caesarean section with contractions	2	4
Face presentation	1	2

As shown below in Table 3. the documentation of the caesarean section categorisation was well recorded by midwifery staff. Categorisation on documentation was poor amongst both Obstetric and Anaesthetic staff.

Table 3: *Percentage of Recordings based on Medical Speciality**.***

Recording of categorisation	Number of recordings	% of cases
Midwife	48	100
Obstetrician (notes)	10	20.8
Obstetrician (operative)	18	37.5
Anaesthetist	15	31.25

Ninety-five percent of the charts had the time of decision documented. Regarding the two cases without documented timing of decision, one was a consultant-led delivery with overall poor documentation.

Although inadequately documented, the matching of categorisation between Anaesthetics and Obstetrics when documented was very good (93%). Of the three that did not match, one was a consultant-led delivery, one was a failed instrumental in theatre and there was one change from a Category one to a Category two.

The change in categories (n=2) and the reasons for these changes were well documented on both occasions.

Decision to Delivery Interval (DDI)

Category one n=7 average time: 22.85 minutes, range 14-43 minutes.

Category two n=41 average time: 41.3 minutes, range 11-96 minutes.

Regarding breach of recommended DDI, there was one delivery completed at 43 minutes with the indication cited as fetal distress. For category two deliveries, there were three that were outside the recommended DDI. One was delivered at 96 minutes from decision, with fetal distress as the indication. A DDI of 89 minutes was identified for a delivery indicated for previous caesarean section. Finally, a DDI of 88 minutes was identified for a delivery that had been downgraded from Category one to two, the indication for this delivery was fetal distress.

Neonatal and maternal outcomes were beyond the scope of this audit.

Discussion

The most frequently identified issue was poor documentation by both medical teams. This is a safety issue and highlights the importance of understanding categorisation in order to achieve safe delivery in optimum timing. Correct documentation is also central to good communication, an area often noted as needing improvement within Obstetrics.[1]

By correctly categorising and documenting this category, all members of the multidisciplinary team can be informed of the level of urgency and speed this delivery warrants.[1]

Although there was poor documentation of category, the majority of cases matched correctly between the two medical teams. This is reassuring as it identifies good verbal communication in emergency settings and reinforces that all members of the team were informed of degree of urgency and of the potential outcomes if there were delays. The introduction of electronic charts may provide a significant improvement in categorisation recording across medical disciplines and midwifery and this would be a useful audit for future audit cycle completion.

The decision to delivery intervals were excellent for both categories and are in line with European standards. The unit performed well with average DDI for Category one being 22 minutes and 41 minutes for Category two. This is reassuring and provides positive ground to build upon. As discussed by RCOG[1] and NICE[2], a DDI of 30 minutes for Category one and 30 to 75 minutes for Category two are reasonable targets and auditable standards for a unit. Although there were breaches of recommended DDI, on case review it is possible that two of the Category two deliveries would retrospectively be categorised as Category three. The knowledge garnered from this review reinforces that these targets are both reasonable and achievable. Inevitably, there will be clinical scenarios that require delivery sooner. In addition, all members of the multidisciplinary team must remember that 'undue haste' to reach a target can lead to poor outcomes from both maternal and neonatal perspectives.[1] It is important to note that NICE advise using the above DDI targets as 'audit standards only and not to judge multidisciplinary team performance for any individual caesarean section'.[2]

There has been debate regarding the 30 minute DDI for Category one caesarean section. Malaysian research suggests that 30 minutes is not an achievable target[6,7] however issues surrounding in-house obstetricians, access to theatre and lack of essential drugs were identified which are far less applicable in an Irish maternity unit setting. To contrast this, a Canadian paper showed that a DDI of 30 minutes is achievable. Their DDI target was achieved in 98% of cases and the median DDI was only 16 minutes.[6,8] These findings show the NICE targets are reasonable and this audit confirms this in an Irish peripheral unit.

The strength of this retrospective study lies in the thorough review of 48 cases. By identifying many variables including indications for emergency delivery, categorization and documentation as well as decision to delivery interval an overarching view of this maternity unit's performance at emergency caesarean section is highlighted. The limitation of the study relates to the smaller sample size which only provide a snapshot of a bigger picture in one unit. However, in reviewing the first 48 cases of 2018 a systematic approach was used to assess an important marker of clinical safety in maternity care.

This audit highlighted various aspects of communication and documentation that can be improved upon. Cavan General Hospital should continue to use this classification system and should continue to adopt an individualised approach to assessment of urgency for varying clinical scenarios.[1]

As highlighted by RCOG, good communication is key to good maternal and neonatal outcomes. All possible avenues to facilitate clear communication amongst the multi-disciplinary team should be explored and implemented, especially in the case of Category one delivery.[1] The practice of 'formal drill' is an excellent method to test this communication and allows for practical application of categorisation of caesarean section in an educational setting.[1] The effect of this simulation-based training across the multi-disciplinary team has been shown through various studies with the proportion of emergency caesareans sections being completed within 30 minutes increasing after educational simulation.[6,9,10]

Regarding future audit, there is scope to increase the sample size of cases reviewed. In addition, identifying the reasons for delayed DDI should be included. These reasons are relevant to varying degrees, depending on the level of service a unit can provide, and this has been highlighted in previous research.[6,7,8]

In conclusion, this retrospective study highlights the importance of categorisation of caesarean section and the need for improvement in how it is understood and used. Overall, the unit's performance is within European expectations. By building on the findings of this audit, education regarding categorisation, use of 'formal drill' and re-iterating the importance of documentation can lead to improvements in staff communication and ultimately both maternal and neonatal outcomes can be enhanced.

Declaration of Conflicts of Interest:

I, Dr. Jennifer Stokes hereby declare that this research titled Categorisation of Caesarean Section and Decision to Delivery Time in a Peripheral Maternity Unit is my own original work under the guidance of Dr. Salah Aziz at Cavan General Hospital. There are no conflicts of interest.

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