

# AUDIT OF DECISION TO DELIVERY INTERVAL IN A LOW RESOURCE SETTING

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## **ABSTRACT**

**Introduction:** *Caesarean section (C-Section) is the delivery of an infant through the abdomen and it is one of the commonest surgeries performed in women of reproductive age. It is performed as an elective or emergency procedure. Emergency C-Section is carried out when an immediate decision is made to deliver the woman because if delivery is delayed, it may result in unwanted consequences which are maternal or perinatal morbidity and / or mortality. An elective C-Section is planned at a date convenient for both the patient and surgeon. The time interval from when the decision for operative delivery was made and when the delivery took place (decision-to-delivery interval) is important.*

**Aim and Objective of Clinical Audit:** *The aim of this clinical audit was to compare the decision to delivery interval with the standard set by professional associations of obstetrics, perinatology and obstetric anaesthesia which is thirty minutes.*

**Research Methodology:** *This was a retrospective clinical audit carried out at a Nigerian hospital over seven months. The sources of data were the Caesarean Section registers at the labour ward which included the C-section booking registrar, C-Section reception register and C-Section operating room register.*

**Results:** *Five hundred and twenty two emergencies C-Sections were studied. The mean decision-to-delivery interval was 218.03 minutes. Only 4.21% had emergency C-Section carried in less than 30 minutes after the decision to carry out a C-Section was made. 2.30% (12) had decision-to-delivery of less than 15 minutes. Most of the emergency C-Sections were carried out between 151-180 minutes 74(14.18%) after the decision of C-Section was taken.*

**Conclusion:** *There is a need to review and address the causes of delay in conducting a Caesarean section after a decision was made, to reduce maternal and perinatal morbidity and mortality.*

**Key Words:** *Caesarean Section, Decision, Delivery Time, Emergency.*

## Introduction

Caesarean section (C-Section) represents a significant operative intervention in obstetrics. Its development and application has saved the lives of countless mothers and infants<sup>1</sup>. C-Section is one of the oldest operations, from ancient times. It is an essential procedure and is practiced widely<sup>1-5</sup>. The operation is usually carried out in cases where vaginal delivery would put the baby or mother's life or health at risk although in recent times it has been also been performed upon request for birth that would otherwise have been natural<sup>6</sup> and can be done either as elective or emergency<sup>6-9</sup>. C-Section performed appropriately and following an appropriate medical indication are potentially life-saving procedures both for the mother and the baby<sup>10</sup><sup>11</sup>. The estimated number of caesarean deliveries in 2012 was 22.9 million<sup>12</sup>. Every year in the world, there is an additional need for 0.8-3.2 million C-Section in low income countries where 60% of the world's births occur. Caesarean section is essential for reducing neonatal maternal morbidity and mortality<sup>10,12</sup>.

The complications following caesarean delivery are maternal mortality, severe maternal morbidity, neonatal morbidity and mortality. Delays in seeking, accessing and receiving quality healthcare in facilities contribute to lower caesarean delivery rates and increase the risk of adverse outcomes following C-Section<sup>13</sup>.

Professional associations of Obstetricians and Gynaecologists recommend that the decision-to-delivery for emergency C-Section should not exceed 30 minutes<sup>14</sup>. The "30 minutes rule" for a decision-to-delivery takes its origin from the guidelines to perinatal care developed jointly by the American Academy of Paediatricians and the American College of Obstetricians and Gynaecologists<sup>15</sup>. In 1995, the Royal College of Obstetrics and

Gynaecology published the "organizational standards for maternity services" in which it was proposed that there be a maximum decision-to-delivery of 30 minutes for emergency C-Section<sup>16</sup>.

**Aim and Objective of the clinical Audit:** Decision to delivery interval is important in any obstetric unit. The aim of this clinical audit is to compare the facility where the audit was conducted with the standard decision-to-delivery interval of thirty minutes.

## Research Methodology

This was a retrospective study carried out at a Nigerian tertiary hospital. The decision to perform an emergency C-Section was made by the most senior obstetrician around who was the consultant on call or the senior registrar. When the decision for operative delivery was made it was recorded in the patients' folder, the labour ward operating theatre and the anaesthetist(s) posted to the labour ward are informed. The patient and patient's spouse were counselled. Necessary investigations were done. Written informed consent was obtained. When both patient and obstetrician were ready, the patient was transferred to the labour ward operating room and surgery commenced. The nurses keep records of time and have registers that show the time of booking the labour ward operating theatre, time the patient arrived the labour operating theatre; and time surgery commences and ends. These registers were the source of data for this clinical audit.

## Results

This clinical audit was conducted over seven months (November 2010 - May 2011), Five hundred and twenty two women who had emergency C-Section during the period were included in the clinical audit, 155(29.7%) were unregistered while 367(70.3%)

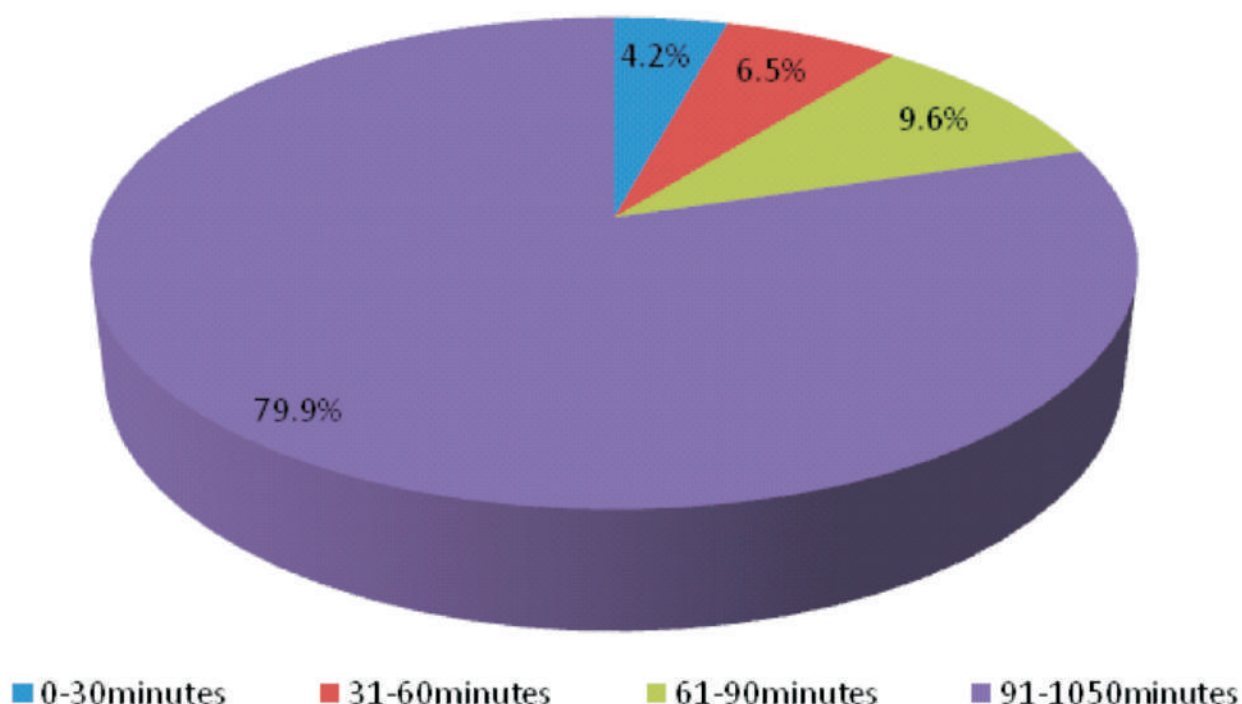
were registered clients. The decision-to-delivery interval for the 522 women is shown in Table I. The mean decision-to-delivery interval was 218.0 minutes. Most (mode) of the emergency C-Sections were carried between 151-180 minutes 74 (14.2%) after the decision of C-Section was made. Only 8(1.5%) had their emergency C-Section carried immediately the decision to deliver by C-

Section was made and 12(2.3%) in less than 15 minutes once the decision of emergency C-Section was made. For anaesthesia 87.2%(455) had subarachnoid block, 10.5%(55) general anaesthesia, 1.0%(5) local infiltration with sedation, 1.0%(5) total intravenous anaesthesia, 0.2%(1) combined spinal anaesthesia and 0.2%(1) epidural anaesthesia.

**Table I:** Decision to Delivery Interval for Emergency Caesarean Section

Decision to Delivery Interval(min)	N	%
0	3	0.6
31	6	1.2
61	9	1.7
91	12	2.3
121	15	2.9
151	74	14.2
181	21	4.0
211	24	4.6
241	27	5.2
271	30	5.7
301	33	6.3
331	36	6.9
361	39	7.5
391	42	8.0
421	45	8.6
451	48	9.2
481	51	9.8
511	54	10.4
541	57	10.9
571	60	11.5
601	63	12.1
631	66	12.6
661	69	13.2
691	72	13.8
721	75	14.4
751	78	14.9
781	81	15.5
811	84	16.1
841	87	16.7
871	90	17.2
901	93	17.8
931	96	18.4
961	99	19.0
991	102	19.5
1021	105	20.1
Tota	1	100.0

**Figure 1: Decision To Delivery Interval**



## DISCUSSION

The use of C-Section is reduced in Africa<sup>13</sup>. C-Section is a complex multidisciplinary procedure<sup>17</sup>. Obstetric emergencies are the leading causes of maternal mortality worldwide and particularly developing countries where literacy, poverty, lack of antenatal care, poor transport facilities and inadequate equipment /staffing combine to magnify the problem<sup>18</sup>. Also there are several myths and taboos surrounding C-Section and the woman may be ridiculed in many Nigerian communities. When emergency C-Section is performed, it is widely advocated that the interval between the decision to operate and delivery of the baby should be less than 30 minutes. The recommendation states that a unit should be able to be ready to perform C-Section within 30 minutes, implying that the interval between decision and delivery may be a little longer<sup>17</sup>. The Obstetric Anaesthetists Association recommended minimum standard in emergencies is that the time from informing the anaesthetist to start

of surgery should not exceed 30 minutes<sup>19</sup>. In this clinical audit only 4.21% emergency C-Section were done within 30 minutes after making the decision. Some of the emergency C-Section were carried out 10 hours after taking the decision to operate. Two (0.03%) emergency C-Section were carried out 1021-1050 (17hours-17hours 30 minutes) after the decision was made.

In the community where the hospital studied is located, women who had C-Section are often mocked by their fellow women as they are seen as infidel, not strong enough to bring forth a child. The extended family system is established such that in some cases the woman cannot give consent for the surgery until she has obtained permission from her in-laws. Even the spouse sometimes has to obtain permission from his own parents and those influential in the family before giving consent for the surgery hence the delay in obtaining consent which increases the decision-to-delivery interval.

Most of the emergency C-Section had a decision-to-delivery interval of 151-180 minutes (14.18%) which is below the acceptable standard of 30 minutes<sup>14</sup>. Many previous studies have demonstrated that for grade 1 and 2 C-Section performed when there is an immediate threat to the life of the woman or foetus or when there is evidence of maternal or foetal compromise which is not immediately life threatening maternal and perinatal outcomes deteriorate measurably when the decision-to-delivery interval exceeds 75 minutes<sup>20</sup>. Emergency C-Section should be performed as quickly as possible in keeping with the capabilities of the institution. Decision-to-delivery interval is an important and integral part of critical conduct interval in acutely compromised foetus<sup>15</sup>. The 30 minutes decision-to-delivery interval for emergency C-Section, despite being a pragmatic rather than evidence-based rule is widely accepted<sup>21</sup>. Once a decision to deliver has been made, delivery should be carried out with urgency appropriate to the risk to the baby and the safety of the mother; the time taken for a patient to reach the operating theatre is a critical predictor of the decision-to-delivery interval<sup>20</sup>.

A decision-to-delivery interval of 30 minutes has been accepted as a gold standard but it seems that the time from the decision for C-Section is taken; transfer of the patient to the operating room, preparation of the team for the surgery and administration of anaesthesia lasts for more than 30 minutes<sup>14</sup>. Various teaching and general hospitals have carried out audits on their response time for emergency C-Section to assess if the proposed standards could be met in their institutions<sup>16</sup>. Though this audit did not compare the outcome following C-Section, emergency C-Section is associated with more neonatal mortality and morbidity probably due to prolonged labour, birth asphyxia and sepsis while

elective C-Section is associated with fewer neonatal deaths<sup>13</sup>.

## CONCLUSION

Reduction in the decision-to-delivery interval will decrease maternal and perinatal morbidity and mortality rates. In most Nigerian cultures, women that have undergone C-Section are ridiculed as they are seen as not strong enough to bring forth a child hence the delay sometimes in obtaining consent. Women education should be encouraged because in Nigeria, most women cannot give consent on their own except their husband or in-laws are present even at the detriment of the health of the woman and the unborn child. A second clinical audit (re-audit) cycle will be carried out to find out at what stage in the preparation for the emergency C-Section that the delay occurs, if it is from delay in obtaining consent, delay in transferring the patient from the labour ward to the operating room, delay in notifying the anaesthetist, delay in the arrival of the anaesthetist or surgeon to the theatre, delay of commencement of the surgery itself or other factors. Recommending and then implementing strategies to eliminate the causes of the delay.

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