DECISION-DELIVERY INTERVAL FOR EMERGENCY CAESAREAN SECTION AND PERINATAL OUTCOME IN THE UNIVERSITY OF CALABAR TEACHING HOSPITAL CALABAR, NIGERIA.

Emmanuel C. Inyang-Etoh- Lecturer- 1

Dept Of Obstetrics And Gynaecology, University Of Uyo, Uyo, Akwa Ibom State.
Saturday J. Etuk- Prof. Of Obstetrics And Gynaecology, University Of Calabar, Calabar. Cross River State.
Eric I. Archibong- Prof. Of Obstetrics And Gynaecology, University Of Calabar, Calabar. Cross River State.

ABSTRACT

The internationally recommended 30 minutes decision-delivery interval for emergency caesarean section has become a cause for concern in many maternity units especially in developing countries. The aim of this study was to evaluate the feasibility of this recommendation in the University of Calabar Teaching Hospital and the consequences of any derailment. This was an analytical study that was conducted on women who had emergency caesarean section in our center over a seven-month period. None of the 150 parturients in the study population was delivered within 30 minutes of decision for emergency caesarean section. Only seven (4.7%) of the parturients were delivered within 1 hour. The mean decision-delivery interval was 3.4 hours. The perinatal mortality rate among the study population was 73 per 1000 births. Among major reasons responsible for delay in the decision-delivery interval were engagement of the theatre and non-availability of anaesthetists. Parturients with failure to progress in labour had a mean decision-delivery interval of 3.2 hours with 3.5% having moderate to severe birth asphyxia. Parturients with fetal distress had a mean decision-delivery interval of 2.8 hours with 21.9% having moderate to severe birth asphyxia. The mean decision-delivery interval of 3.4 hours was attained in parturients with obstructed labour with 50% having moderate to severe birth asphyxia. The attainment of the recommended 30 minutes decision–delivery interval for emergency caesarean section was not feasible in the University of Calabar Teaching Hospital.

Key words: emergency, caesarean section, decision-delivery interval, perinatal outcome.

INTRODUCTION

Caesarean section is one of the oldest and most commonly performed surgical operations in women with its origin lost in antiquity.[1] In the past three decades, the rate of caesarean section has steadily increased from about 5 percent to more than twenty percent in both developed and developing countries.[2] The United states of America however has a relatively high rate of caesarean section largely due to defensive practice by obstetricians in order to evade the high rate of litigation prevalent there. Other factors leading to high rates of caesarean section in the United States of America include continuous electronic fetal heart monitoring in labour, repeat caesarean sections and a generally low threshold for caesarean section when dystocia and other complications occur in labour.[4,5]

In the beginning, caesarean section had a case fatality of nearly 100 percent due largely to poor surgical technique, haemorrhage, infections and other postoperative complications. Nowadays, caesarean section is a relatively safe surgical operation because of the remarkable developments that have taken place in the field of medicine in the last six decades. These developments include improved surgical technique, safe anaesthesia, safe blood transfusion services and effective antibiotics.[4,5]

Emergency caesarean section provides an escape route for the fetus whenever there is severe maternal or fetal complications in pregnancy or labour. It remains invariably, a quick and safe route of delivery

Corresponding Author:
Dr. E. C. Inyang-Etoh
P. O. BOX 200
Ikot Ekpene
Akwa Ibom state
Phone: 2347034038318
E- mail: emmacol2000@yahoo.com

for the compromised fetus.[2,5] In most emergency caesarean sections, time is of the essence thus a standard decision-delivery interval of 30 minutes has been recommended with medicolegal implications.[6]

This study sought to establish the decision-delivery interval for emergency caesarean section in the University of Calabar Teaching Hospital and to see whether any derailment is associated with adverse perinatal outcome. It is hoped that the findings of this study will help us to possibly improve on our standard of care in emergency caesarean sections.

MATERIALS AND METHODS

STUDY AREA

This study was conducted over a seven-month period in the maternity unit of the University of Calabar Teaching Hospital. Calabar is the capital of Cross River state, which is located in the south-east health zone of Nigeria. The population of Calabar is 371,022 people- final report of the 2006 Nigerian census. The University of Calabar Teaching Hospital is the only tertiary health facility in the state. It provides specialist obstetric care to patients who present themselves voluntarily to the hospital as well as those referred from private or public health care facilities in the state and its environs.

METHODOLOGY

Clinical records of patients who were delivered by caesarean section during the period under review were obtained from the postnatal wards of the University of Calabar Teaching Hospital within 48 hours after delivery. The clinical records of patients who were delivered by emergency caesarean section were selected for in depth study. Parturients who had preterm delivery, narcotic analgesic during labour, gross congenital malformation, intrauterine fetal death and difficult caesarean delivery were excluded from the study because of their possible adverse effects on the Apgar scores of infants. Information abstracted from the clinical records included: maternal age, booking status and indications for emergency caesarean section. Other pieces of information obtained included reasons for delay if any, decision-delivery interval and the 5-minute Apgar scores. Data obtained were analysed with descriptive and inferential statistics. The Pearson coefficient was used to assess for any association between decision-delivery interval and the incidence of moderate to severe birth asphyxia. Moderate to severe birth asphyxia was defined as 5-minute Apgar scores of 5 or less.[7]

RESULTS

During the period under review, 219 caesarean sections were performed in the maternity unit of the University of Calabar Teaching Hospital. One hundred and fifty-five (155) were emergencies, while sixty-four (64) were elective cases. This gave an emergency caesarean section rate of 70.8 percent during the period. Five parturients were however excluded from the study because they did not meet the inclusion criteria for the study.

Out of the one hundred and fifty patients who were used for the study, none was delivered within 30 minutes of decision for emergency caesarean section. Only seven (4.7%) patients were delivered within one hour following the decision for emergency caesarean section. The mean decision-delivery interval for all patients was 3.4 hours. There were 11 (7.3%) perinatal deaths among the study population giving a perinatal mortality rate of 73 per 1000 births during the study period.

Table I shows the age distribution and booking status of parturients in the study population. The highest number 130 (86.7%) of emergency caesarean sections were performed among age group 25-34 years and the majority (63.0%) were booked parturients. Age group, 35-44 years had the lowest rate 17 (11.3%) of emergency caesarean sections during the period. Overall, majority (78.7%) of the parturients were booked while the rest of the parturients accounted for 21.3 percent.

The indications for emergency caesarean section in the study population are shown in table II. Failure to progress in labour accounted for the highest indication of 38 percent, while fetal distress accounted for 21.3 percent. Obstructed labour was indication for emergency caesarean section also in 21.3 percent of parturients. Footling breech presentation in labour was the least indication for emergency caesarean section in the study population.

Table III shows the various reasons for delay from decision to delivery by emergency caesarean section in the study population. In 18.0 percent of patients, the theatre was engaged, while the anaesthetist was not available in 10.6 percent of cases. In the majority (55.3%) of parturients, the reason for delay was not documented in the case notes.

Table IV shows a cross tabulation of the indications,

the mean decision-delivery intervals and the 5-minute Apgar scores. The mean decision-delivery interval for parturients with failure to progress in labour was 3.2 hours and 3.5% had Apgar scores of 5 or less. Parturients with fetal distress had a mean decision-delivery interval of 2.8 hours and 21.9% had a 5-minute Apgar scores of 5 or less. There was a perfect positive correlation (r= 1.0) between decision-delivery interval and the incidence of moderate to severe birth asphyxia among parturients with failure to progress in labour and parturients with fetal distress. Parturients with obstructed labour had a mean decision-delivery interval of 3.4 hours and 50 percent had a 5-minute Apgar scores of 5 or less. There was a positive correlation (r= 0.9) between decision-delivery interval and the incidence of moderate to severe birth asphyxia among parturients with obstructed labour.

DISCUSSION

It has become necessary to evaluate the feasibility of the internationally recommended decision-delivery interval of 30 minutes for emergency caesarean section in maternity units across the world. None out of the 150 caesarean sections in this study was performed within 30 minutes of decision for emergency caesarean section. This finding displays the inability of our centre to attain the recommended 30 minutes interval. This is however similar to results obtained by Onah et al[8] in eastern Nigeria where none of the 224 caesarean sections in their study was performed within 30 minutes interval.[8] Nonetheless, results of studies done in Britain contrasted with ours. In one of such British studies, 66.3% of the caesarean deliveries were performed within 30 minutes and in another study, 71% of the parturients were delivered within the recommended 30 minutes interval from decision.[6,9]

This study reveals that only 4.7% of the parturients in the study population were delivered within 1 hour of decision for emergency caesarean section. This finding and others done in other parts of Nigeria and Africa seems to suggest that the earliest decision-delivery interval attainable in our environment is 1hour.[8,10,12] In contrast, 88.3% of parturients were delivered within 40 minutes in a British study.[9]

The perinatal mortality rate during the period under review was 73 per 1000 births. The reason for this relatively high perinatal mortality rate in this study is not clear but may be due to the fact that the study population comprised patients with various complications warranting emergency caesarean section. Some of these complications were associated with severe fetal compromise. Delay in decision-delivery interval probably also had its influence on the perinatal outcome of patients in the study population. Onwudiegwu[10] obtained a rather low perinatal mortality rate of 37 per 1000 births in his study. Failure to progress in labour constituted the highest (38%) indication for emergency caesarean section in the study population. This probably reflects vigilant intrapartum care as most cephalopelvic disproportion are initially associated with failure to progress in labour before they progress to the stage of obstruction. This finding was similar to a result obtained in another centre in Nigeria.[10] Oladipo[11] et al on the other hand had obstructed labour leading to the highest indication for caesarean section in their study.

Various reasons were responsible for delay in the decision-delivery interval in the study population. Among major reasons for delay were engagement of the theatre and non-availability of the anaesthetists on duty. There is a peculiar problem in our maternity unit where only one functioning operating suite is reserved for obstetric surgeries. There is also chronic shortage of anaesthetic personnel in our centre because resident doctors shy away from aneasthesia as a specialty for various reasons. Similar reasons for delay were found in other studies in Nigeria.[8,10] A rather worrisome finding was a situation where the reasons for delay for majority (55.3%) of parturients were not documented in the patients' case notes. The reason for this aberration is not understood, although, it is probable that in those cases, there were no specific reasons for delay; such delays may therefore reflect a rather slow response to surgical emergencies in our centre at the time of the study. The mean decision-delivery interval in the study population was 3.4 hours. This was shorter than the mean decision delivery interval of 4.4 hours obtained in another centre in Nigeria and a different centre in Africa.[10,12] Relatively short mean decision-delivery intervals were obtained in studies done in Britain.[9,13] There was a perfect positive correlation (r= 1.0) between decision-delivery interval and incidence of moderate to severe birth asphyxia among parturients with failure to progress in labour and patients with fetal distress. Parturients with obstructed labour also had a positive correlation (r= 0.9) between decision-delivery interval and incidence of moderate to severe birth asphyxia. This finding suggests that for certain indications,

increasing interval between decision and caesarean delivery is associated with low Apgar scores. It is however important to note that some workers have failed to obtain a positive correlation in their studies for the same indications.[8,9] Such workers have opined that several factors may be responsible for low Apgar scores in infants of parturients delivered by emergency caesarean section. Due to lack of agreement of results obtained from relevant studies, the college of Obstetricians and Gynaecologists of New Zealand and Australia has recommended the categorization of the indications for emergency caesarean section into four based on the severity of the threat to maternal and fetal lives.[14] This recommendation is based on the knowledge that perinatal outcome also depends on the pathogenesis of the specific condition warranting emergency caesarean section and the intrinsic ability of the fetus to withstand such insults.[15] Thus, some parturients with a certain indication for emergency caesarean section could have the decision-delivery interval linger for several hours without any adverse effect on the fetus while others would result in intrauterine fetal death if the fetus is not delivered early.

CONCLUSION/RECOMMENDATIONS

In conclusion, the attainment of the internationally recommended 30 minutes decision-delivery interval in emergency caesarean section could not be achieved in the University of Calabar Teaching Hospital, Calabar-Nigeria. This was due largely to inadequate theatre facility, dearth of anaesthetic personnel and perhaps, a generally slow response to surgical emergencies in the centre. Although there was a positive correlation between decision-delivery interval and incidence of moderate to severe birth asphyxia among the major indications for emergency caesarean section in the study population, perinatal outcome is likely to be influenced by multiple factors. It is therefore reasonable to consider categorization of the indications for emergency caesarean section based on the clinical evidence of urgency with every single case being considered on its merit. While the recommended 30 minutes decision-delivery interval may remain as the standard, efforts should be made to improve response to surgical emergencies in our centre in order to keep the decision-delivery interval as short as possible for improved perinatal outcome.

TABLE I: AGE DISTRIBUTION AND BOOKING STATUS OF PARTURIENTS IN THE STUDY POPULATION

Age(Years)	Booked	Unbooked	Referred	De faulted	Total
16-24	22	7	0	1	30
25-34	82	14	4	3	130
35-44	15	1	1	0	17
Total	119	22	5	4	150

TABLE II: INDICATIONS FOR EMERGENCY CAESAREAN SECTION IN THE STUDY POPULATION

Indications	No. of patients (%)
Failure to progress in labour	57 (38.0)
Fetal distress	32(21.3)
Obstructed labour	32(21.3)
Footling breech	6(4.0)
Uterine rupture	7(4.6)
Intrapartum haemorrhage	8(5.3)
Severe pre-eclampsia	8(5.4)
Total	150(100.0)

TABLE III: REASONS FOR DECISION -DELIVERY DELAY AMONG PARTURIENTS IN THE STUDY POPULATION

Reasons for delay	No. of patients (%)
Awaiting blood	2 (1.3)
No electricity	4(2.7)
Theatre not ready	4(2.7)
Patients refusal	7(4.7)
Surgeon not available	7(4.7)
Anaesthetist not available	16(10.6)
Theatre engaged	27(18.0)
Not stated	83(55.3)
Total	150(100.0)

TABLE IV: INDICATIONS, MEAN DECISION -DELIVERY INTERVAL (DDI) AND APGAR SCORES AMONG PARTURIENTS IN THE STUDY POPULATION

Indications	Mean DDI (Hours)	5-minnute Apgar scores over 10			
		7-10	6	4 or 5	0-3
Failure to preogress	3.2	46	9	2	0
Fetal distress	2.8	16	9	4	3
Obstructed labour	3.4	20	4	1	7
Footling breech	2.2	6	0	0	0
Uterine rupture	2.1	0	0	2	5
Intrapartum haemorrhage	4.0	6	1	1	0
Severe pre-eclampsia	6.2	2	3	1	2

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