

**THE APPLICATION OF GOOD OPERATIVE PRACTICES AND
OPTIMALITY OF THE DIAGNOSIS OF COMMON INDICATIONS
FOR EMERGENCY CESAREAN DELIVERY AT KENYATTA
NATIONAL HOSPITAL – NAIROBI KENYA
(CESAREAN AUDIT)**

DR STEPHEN OTIENO GWER (MB ChB)

A dissertation submitted in partial fulfilment of the requirements for the
degree of Master of Medicine in Obstetrics and Gynaecology of the
University of Nairobi.

June 2009

DECLARATION

I certify that this dissertation is my original work and has not been presented in any other university for the award of a degree.

SIGNED _____ **Date** _____

The undersigned, being University of Nairobi supervisors, certify that they have read and hereby recommend for acceptance by the University a dissertation entitled: *The application of good operative practices and optimality of the diagnosis of common indications for emergency cesarean delivery at Kenyatta National Hospital – Nairobi Kenya (cesarean audit)*; in partial fulfilment of the requirements for the award of the degree of Master of Medicine in Obstetrics and Gynaecology

DR. ALICE MUTUNGI

SENIOR LECTURER

DEPARTMENT OF OBSTETRICS & GYNAECOLOGY

UNIVERSITY OF NAIROBI

CONSULTANT OBSTETRICIAN AND GYNAECOLOGIST

KENYATTA NATIONAL HOSPITAL

SIGNED _____ **Date** _____

DR. JALDESSA GUYO

CONSULTANT OBSTETRICIAN AND GYNAECOLOGIST

KENYATTA NATIONAL HOSPITAL

HONORARY LECTURER

DEPARTMENT OF OBSTETRICS & GYNAECOLOGY

UNIVERSITY OF NAIROBI

SIGNED _____ **Date** _____

DEDICATION

To the everlasting memory of

ELGA AKOTH O. OTIENO

(Feb 1980 – Feb 2008)

And to our son

GORDON A. O. PACHO

Things turn out best

For people who make the best

Of how things turn out

(Anonymous)

ACKNOWLEDGEMENT

My appreciation goes to the **Ministry of Health**, for having granted me study leave and scholarship to pursue my studies.

Special thanks to **Dr. Jaldesa Guyo** and **Dr. Alice Mutungi** for their guidance, invaluable advise and support in the preparation of this dissertation, I would also extend my gratitude to the lecturers and consultants of the department for their invaluable teachings.

The staff of Labour Ward, the Maternity Wards and Newborn Unit, for their cooperation and assistance during data collection and compilation.

Jos van Roosmalen, of the Leiden University Medical Centre in the Netherlands, for his engaging conversations, one of which led to the conception of this dissertation.

Amos Salim Apel for his diligence and accuracy as a data collection assistant

Frederick Osewe, for providing a Swahili translation of the Consent Form.

Isaac Odero who proof read the penultimate draft and weeded it off grammatical errors.

I am greatly indebted to **Joseph Onam Auma**, for his inestimable help with data entry and analysis.

My colleagues in the department for having provided constructive criticism and support that made this dissertation better. And for their encouragement and best wishes

My parents **Mr. Oliver Gwer** and **Mrs. Herine Gwer**, and my brothers for their encouragement, support, prayers and belief, without which am a lesser person.

Finally to the **Almighty God**, for whom all things are possible and are to his Eternal Glory, for granting me good health and keeping me focused.

TABLE OF CONTENTS

Title.....	i
Declaration.....	ii
Dedication.....	iii
Acknowledgement.....	iv
Table of Contents.....	v
Abbreviations.....	vii
Glossary of terms.....	ix
List of figures and tables.....	xii
Abstract.....	xiii
1.0 Introduction.....	1
2.0.0 Literature Review.....	2
3.0 Study Justification.....	17
4.0 Research Question	18
5.0 Study Objectives.....	19
6.0.0 Methods	
6.1.0 Study design.....	20
6.2.0 Study site.....	20
6.3.0 Study population.....	21
6.4.0 Sample size estimation.....	22
6.5.0 Diagnostic criteria.....	23
6.6.0 Recruitment and Training of Research Assistant.....	25
6.7.0 Pretesting of Data Collection Instruments.....	25
6.8.0 Data collection and handling.....	25
6.9.0 Study variables and Outcomes.....	27
6.10.0 Data Processing and Analysis.....	27

6.11.0 Ethical Considerations	27
6.12.0 Study Limitations.....	28
7.0.0 Results	
7.1.0 Socio Demographics.....	29
7.2.0 Optimality of Diagnosis.....	31
7.3.0 Senior Consultation.....	33
7.4.0 Decision to Delivery Interval.....	33
7.5.0 Incision, Anaesthesia, Prophylaxis.....	34
7.6.0 Maternal Outcomes.....	35
7.7.0 Fetal Outcomes.....	36
8.0 Discussion.....	40
10.0 Conclusion.....	50
11.0 Recommendations.....	50
12.0 References.....	52
13.0 Appendix	
13.1.0 Appendix I (Questionnaire).....	58
13.2.0 Appendix II (Consent Form).....	63
13.3.0 Diagnostic Criteria.....	66
13.4.0 Budget.....	73
13.5.0 Mselenge's Publication.....	74

ABBREVIATIONS

1 PS.....	One Previous Scar
ACOG	American College of Obstetricians and Gynecologists
ANC	Ante Natal Care
APH.....	Ante Partum Haemorrhage
AVD	Assisted Vaginal Delivery
CD.....	Cesarean Delivery
CPD	Cephalo Pelvic Disproportion
CS.....	Cesarean Section
CSR.....	Cesarean Section Rate
DDI.....	Decision to Delivery Interval
ECV	External Cephalic Version
EPMR.....	Early Perinatal Mortality Rate
FBS.....	Fetal Blood Sampling
FHR	Fetal Heart Rate
FSB	Fresh Still Birth
FIGO.....	International Federation of Gynaecologists and Obstetricians
GA	General Anaesthesia
GNP	Gross National Product
GoK.....	Government of Kenya
ISO	International Standards Organization
KDHS.....	Kenya Demographic and Health Survey
KNH.....	Kenyatta National Hospital.
LUSCS	Lower Uterine Segment Cesarean Section.
MMed.....	Master of Medicine (Degree)
MMR.....	Maternal Mortality Rate
MOH.....	Ministry of Health
MSB	Macerated Still Birth
MSL	Meconium Stained Liqueur
MTRH.....	Moi Teaching and Referral Hospital
NBS	Nairobi Birth Survey

NNDR.....Neonatal Death Rate
RCT..... Randomized Control Study
SBR.....Still Birth Rate
SUMI Sub Umbilical Midline Incision
SVD Spontaneous Vertex Delivery
TOLTrial Of Labour
UoN.....University of Nairobi.
VBAC.....Vaginal Birth After Cesarean
WHO.....World Health Organization

GLOSSARY OF TERMS

These terms are defined with emphasis to the meaning implied in this study

Best practices at cesarean delivery – These are interventions and practices for which there is current evidence that they lead to optimal outcomes for both the mother and the baby and are therefore recommended as part of standard practice.

Cesarean Section / Cesarean Delivery - delivery of a fetus (that has reached the age of viability), placenta and membranes through an incision in the anterior abdominal and uterine walls.

Cesarean section rate – the percentage of all live births delivered by cesarean delivery.

Common indications for cesarean delivery – the common diagnoses that lead to emergency cesarean delivery at KNH (as used in these study). They are; previous cesarean, presumed fetal compromise, hypertensive disease in pregnancy, dystocia, mal-presentation commonly breech, and third trimester bleeding.

Cross sectional study - The observation of a defined population at a single point in time or time interval. Exposure and outcome are determined simultaneously.

Decision to delivery interval – the length of time it takes between the decision to deliver a mother via cesarean and the start of the surgery, or delivery of the baby by other means (be it vaginal, or laparotomy for ruptured uterus)

Diagnostic criteria – the standards set in this study that had to be met in making a diagnosis of one of the common indications (defined above) for emergency cesarean delivery (defined below). The diagnoses that met this criteria were considered optimal while those that did not meet the criteria were considered sub optimal.

Emergency Cesarean Delivery – delivery by cesarean that is indicated due to either: an immediate threat to either the mother or the fetus; or suspected maternal or fetal compromise though not life threatening, or circumstances demanding an immediate operative delivery to optimize outcome.

Maternal mortality ratio - The number of maternal deaths per 100,000 live births. This is considered more accurate measure of the risk of obstetric death than the **Maternal Mortality Rate** which is the number of maternal deaths per 100,000 women of reproductive age (15 -49) during a given period

Optimal diagnosis – A diagnosis for one of the common indications (defined above) that meets the diagnostic criteria (as defined above) set for it. Optimal is the adjective that describes the diagnosis, optimality is thus the quality possessed by the diagnosis that lends it that description, e.g. equal and equality. See sub optimal diagnosis below.

Partograph – The graphical representation of labour progress, events and interventions, which is recommended by WHO, a blank copy of which is usually provided in all files of patients admitted to labour ward KNH.

Perinatal mortality rate- the no of stillbirths and early neonatal deaths (occurring within the first week) per 1000 total births. **Early Perinatal Mortality Rate (EPMR)** is the number of still births and neonatal deaths occurring within the first 24 hours per 1000 live births.

Prophylactic antibiotics - antibiotics prescribed to be given pre- or intra-operatively with the aim of preventing post operative (operation site) infection. Separate from the one usually prescribed and given post operatively.

Senior consultation – the opinion of a senior registrar or consultant in obstetrics, which was sought to support the decision to deliver a patient by emergency cesarean section.

Sub optimal diagnosis - diagnosis for one of the common indications (see above) that does not meet the set diagnostic criteria.

LIST OF TABLES AND FIGURES.

Table (i) How to arrive at the optimal diagnosis using the criteria.....24

Table (ii) Study Variables and Outcomes.....27

Table (iii) Definition of terms to describe FHR patterns.....70

Table (iv) Budget.....73

Table 1 – Outline of the Deliveries29

Table 2 – Socio Demographic Characteristics30

Table 3 – Proportion of Sub Optimal Diagnosis per indication.....31

Table 4 – Mode of delivery vs. Optimality.....32

Table 5 – Senior Consultation vs. Optimality.....33

Table 6 – DDI vs. Mode of Delivery.....34

Table 7 – Incision, Anaesthesia & Prophylaxis.....35

Table 8 – Maternal Outcome vs. Optimality.....36

Table 9 – Fetal Outcome vs. Optimality37

Table 10 – Frequency of Baby Weights by Category.....38

Figure 1 – Baby Weights in Categories.....38

Figure 2 – Sex Ratio.....39

ABSTRACT

This study evaluated the diagnosis of common indications for emergency cesarean delivery at Kenyatta National Hospital (KNH). It focused on optimality of the diagnoses and evaluated some of the practices at cesarean delivery that are associated with favourable outcomes.

Design: Cross sectional descriptive study

Study site: The study was conducted at KNH Department of Obstetrics.

Methods: Case note for all deliveries in KNH between 18th January and 23rd February 2009 both dates inclusive were sought and perused daily. Eligible consecutive pregnant women, for whom a decision to undergo emergency cesarean delivery for the following diagnoses; Prior uterine scar, presumed fetal compromise, hypertensive disease in pregnancy, breech presentation, dystocia and third trimester bleeding, were recruited to the study. These had been determined to be the six leading indications for emergency CD in the unit. A questionnaire was filled by obtaining details from their case notes, nursing care notes and treatment sheets.

Optimality of diagnosis, Decision to Delivery Interval, Senior consultation, use of prophylactic antibiotics and of regional anaesthesia was determined and described. Data was analyzed using SPSS version 11, descriptive statistics are presented. Chi square tests were used to determine significance.

Results: One thousand and eighty women were delivered during the study duration, 409 via cesarean (CSR-37.9%). 306 of 327 eligible women were recruited. 51% had a sub optimal diagnosis with Prior uterine scar and presumed fetal compromise being the main contributors (72%). Most (88%) of the time there was no senior consultation. Only 10% were delivered within an hour of decision. Most (97%) were not given prophylactic antibiotics and 57% were offered spinal anaesthesia. Maternal and fetal outcomes were worse in those with an optimal diagnosis. The Still birth rate (SBR) was 12.5; Early Perinatal Mortality Rate (EPMR) was 58.8, Neonatal Death Rate (NDR) of 12.2 per 1000

live births. One participant died during the study duration due to haemorrhage giving a case fatality rate of 0.33%.

Conclusions: The CSR was high; with the common indications we sought contributing 68% of all the cesarean deliveries (Emergency and Elective cases) and 85% of the emergency sections. Prior uterine scar and presumed fetal compromise were the largest contributors to suboptimal diagnosis. Rarely were the consultants' opinions sought prior to decision and few of the patients were delivered within an hour of decision. Pre operative antibiotic prophylaxis was hardly (3%) ever prescribed, with over half of the women being offered spinal anaesthesia. Maternal and fetal outcomes were worse amongst those found to have an optimal diagnosis.

Recommendations: Strategies to increase optimal diagnosis for emergency cesarean deliveries be formulated. Measures to: promote consultation prior to decision, shorten the decision to delivery interval, ensure provision of preoperative antibiotic prophylaxis, and promote the use of regional anaesthesia be instituted, for women undergoing emergency cesarean section. A more comprehensive study should be done in the future to check the trends and assess other parameters like the sepsis rate and other long term complications.