COMPARISON OF PREGNANCY OUTCOME AMONG STANDARD PRIMIGRAVIDAE AND LOW PARITY WOMEN DELIVERING AT MUHIMBILI NATIONAL HOSPITAL, DAR ES SALAAM, TANZANIA.

By

Dr Fadhlun Mohamed Alwy, MD (DAR)

A dissertation submitted in partial fulfilment of the requirements for the degree of Master of Medicine in Obstetrics and Gynaecology of the Muhimbili University of Health and Allied Sciences (MUHAS)

Muhimbili University of Health and Allied Sciences (MUHAS).

October, 2008.

COLLEGE LIBRARY
MUHIMBILI UNIVERSITY
COLLEGE OF HEALTH SCIENCES

CERTIFICATION

The undersigned certifies that he has read and recommend for acceptance the dissertation entitled, '**Comparison of pregnancy outcome among standard primigravidae and low parity women delivering at Muhimbili National Hospital, Dar es salaam**' in partial fulfilment of the requirements for the degree of Master of Medicine in Obstetrics and Gynaecology of the Muhimbili University of Health and Allied Sciences.

PROF. H. N. MGAYA

Supervisor

Date 26/11/13

DECLARATION AND COPYRIGHT

I, Dr Fadhlun Mohamed Alwy, declare that this dissertation is my own original work, and has not been presented and will not be presented to any other University for a similar or any other degree or award.

Signature.....

Date.....

This dissertation is copyright material protected under the Berne Convention, the Copyright Act of 1999 and other international and national enactments, in that behalf, on intellectual property. It may not be reproduced by any means, in full or in part, except for short extracts in fair dealing; for research or private study, critical scholarly review or disclosure with an acknowledgement, without the written permission of the Directorate of Postgraduate Studies, on behalf of both the author and the Muhimbili University of Health and Allied Sciences (MUHAS).

© Muhimbili University of Health and Allied Sciences (MUHAS).

ACKNOWLEDGEMENT

I wish to express my sincere gratitude to Professor H. N. Mgaya for his supervision, criticism and advice during the preparation of this dissertation.

I extend my gratitude to all specialists and consultants in the department of Obstetrics and Gynaecology of the MUHAS and MNH for their valuable inputs during this dissertation development. I am also grateful to Dr Candida Moshiro of the department of Epidemiology and Biostatistics for her professional advice.

I would like to mention Mr H. Sagaf, Mr S. Abdallah and Mr B. Haroon, and to express my appreciation for their support during my residency period.

Lastly, but not least, I would like to thank ALLAH almighty for making this work possible.

DEDICATION

This dissertation is dedicated to

My late father: Sharif M. A. Al-beity, who passed on the 5th August, 2007

My mother, Fatma M. Bajabir

My mentor, friend and teacher, Anacleit. K. L.

ABSTRACT

Background

Primigravidity has been associated with unfavourable pregnancy outcome. The standard primigravidae, a subgroup of primigravidae are known to have better feto-maternal outcome compared to the rest of the primigravidae. There is paucity of data on the standard primigravidae in our setup including their proportion and pregnancy performance.

Objective

To determine the proportion of standard primigravid women and compare their pregnancy outcome to women of low parity delivering at Muhimbili National Hospital, Dar es salaam, Tanzania.

Methodology

A cross sectional study was conducted from 1st July, 2007 to 31st December, 2007 at Muhimbili National Hospital, Dar-es-salaam, Tanzania. All standard primigravidae were identified and recruited on admission, followed by two other women of low parity with similar obstetric characteristics. Data on socio-demography, antenatal and any previous obstetric performance, intra-partum events and fetal outcomes were recorded. Modes of delivery, intrapartum complications, maternal and fetal outcomes between the two groups were then analyzed.

Results

The standard primigravidae comprised 7.0 % of the total obstetric population during the study period. Women in the standard primigravid group had a higher emergency CS rate as compared to women of low parity (22.0% versus 14.8%, p-value 0.014). Major indications for the emergency CS were similar among the two groups except for CPD which was higher in the standard primigravid women (23.1% versus 12.7%). Other indications were obstructed labour, fetal distress, poor progress and malpositions. Higher rates of oxytocin augmentation during labour and episiotomies were observed in the standard primigravid women as compared to low

parity women (61.5% versus 26.7%, p-value 0.00 and 13.9% versus 1.0%, p-value 0.00 respectively). The standard primigravidae had higher rates of prolonged labour (25.7% versus 14.6% p-value 0.03) and fetal distress (11.2% versus 5.5%, p-value 0.04) than the low parity women. Other intrapartum complications like occurrence of intrapartum eclampsia and postpartum haemorrhage were not different in the two groups. The low parity women had significantly higher proportion of severe genital tract injuries than the standard primigravida women (1.7% versus 0.9, p-value 0.038). There were two maternal deaths among the study group, both were in the low parity women. The underlying causes of deaths were obstetric haemorrhage.

There were more neonates with Apgar score < 7 at 5th minute among standard primigravidae as compared to low parity women (10.2% versus 3.8%, p-value0.001). More neonates of standard primigravidae required Neonatal unit admission as compared neonates of low parity women (13.1% versus 6.3%, p-value 0.00). The proportion of neonatal admission due to birth asphyxia was higher among the standard primigravidae than in the other group (73.2% versus 56.7%, p-value 0.05).

Conclusion and Recommendations

This study found the standard primigravidae to have a slightly higher risk of poor pregnancy outcome as compared to low parity women. Thus there is a need for a more aggressive intrapartum monitoring system in this group. There is also a need for a larger study on the performance of standard primigravidae, primigravidae in general and low parity women for a proper risk categorization and earlier planning of delivery. Regular clinical audit in the intrapartum care may help to reduce the higher morbidities among standard primigravidae.

TABLE OF CONTENTS

Certification i

Declaration and Copyright ii

Acknowledgement iii

Dedication iv

Abstract v

Table of contents v

List of tables ix

Abbreviations x

Definition of terms xi

1.0 Introduction and Literature review 1

1.1 Introduction 1

1.2 Literature review 3

2.0 Statement of the problem and Rationale 7

2.1 Statement of the problem 7

2.2 Rationale of the study 7

2.3 Research question 8

2.4 Null Hypothesis 8

3.0 Objectives 9

3.1 Broad objectives 9

3.2 Specific objectives 9

4.0 Methodology 10

4.1 Study design 10

4.2 Study area 10

4.3 Study population 11
4.4 Sample size 12
4.5 Sampling technique 12
4.6 Inclusion criteria 12
4.7 Exclusion criteria 12
4.8 Training of research assistants 13
4.9 Pilot study 13
4.10 Study tools 13
4.11 Data collection 13
4.12 Study variables 14
4.13 Data entry and analysis 15
4.14 Ethical considerations 15
4.15 Limitation of the study 16

5.0. Results 17
6.0. Discussion 27
7.0. Conclusion 32
8.0. Recommendation 32
9.0. References 33
10.0. Appendix I 37
Appendix II 43
Appendix III 49

LIST OF TABLES

Table 1: Socio-demographic characteristics of the study population..... 18

Table 2: Obstetric characteristics of the study population..... 19

Table 3: Mode of delivery among standard primigravid women and low parity women..... 20

Table 4: Indications for caesarean section delivery among standard primigravidae and low parity women..... 21

Table 5: Intrapartum and immediate postpartum complications among the standard primigravidae and low parity women..... 22

Table 6: Early neonatal outcome among the standard primigravidae and low parity women..... 24

Table 7: Obstetric factors associated with low Apgar score..... 26

ABBREVIATIONS

APH	Antepartum Haemorrhage
CPD	Cephalopelvic Disproportion
CS	Caesarean Section
MNH	Muhimbili National Hospital
MUHAS	Muhimbili University of Health and Allied Science
PPH	Postpartum Haemorrhage

DEFINITION OF TERMS

Standard primigravida in this study **defines a 20- 34 years old woman**, ≥ 150cm in height (RCH4), with her first pregnancy, with a live, singleton fetus in cephalic presentation and does not have a known chronic medical conditions or medical complication of pregnancy on admission.

Low parity woman refer to a woman who has had one or two previous deliveries at more than 28 weeks of gestation age and is having her second or third delivery (Para 1 and 2, Gravida 2 and 3). This definition excludes women with previous abortions.

Severe genital tract injuries in this study were taken as occurrence of cervical and high vaginal tears requiring anaesthesia for repair and third degree perineal tears.

Medical complication of /during pregnancy was defined as medical conditions which were likely to results in adverse maternal and neonatal outcome such as anaemia (Haemoglobin < 8.5 g/dl), eclampsia, diabetes mellitus, renal disease, Sickle cell disease. They must have been diagnosed before admission.

Postpartum haemorrhage in this study is defined as blood loss of or more than 500 mls following vaginal delivery and 1000 mls following abdominal delivery.

Prolonged labour was taken as labour exceeding the Action Line in the partogram by two or more hours.

Immediate postpartum period was taken as the first twenty four hours after delivery of the baby

Early neonatal period is the period just after delivery to twenty four hours of life.

1.0 INTRODUCTION AND LITERATURE REVIEW

1.1 Introduction

Standard primigravida is a term used to describe a primigravida with low risk of adverse feto-maternal obstetric outcome and low rate of intrapartum intervention[1]

Patterson et al., defined the term standard primigravida, as a woman in her first pregnancy, of 20 -34 years age group, ≥ 155cm in height with singleton, live, cephalic fetus at term (gestation age ≥ 37 weeks) with no known chronic medical conditions or medical complication of pregnancy and delivered at the obstetric unit she booked at[2]. This definition has been modified further and it has been used as a tool in assessing maternity care in different maternity units [1, 3].

Over the course of years, primigravidity has been regarded as a non specific risk for adverse maternal and perinatal outcome compared to general obstetric population. There is a significant risk of hypertensive diseases of pregnancy, dysfunctional labour, perineal injury and poor neonatal outcome among primigravids as compared to parous women. Likewise, the risk of having eclampsia, ante partum hemorrhage, postpartum hemorrhage, obstetric trauma and operative delivery is high among primigravid women as compared to parous women.[4] It is important, however, to emphasize that all primigravidae are not the same. Indeed, studies show that there are different classes of primigravidae.

Low parity group of women refers to women, who have delivered a fetus more than 28 weeks once or twice i.e. Para 1-2. This group of women is known to have the lowest risk of adverse maternal and neonatal outcome provided the previous pregnancy (pregnancies) was (were) devoid of complications[4]. The risks of having these adverse pregnancy outcomes increase significantly during delivery of the fourth child and above. [4, 5]

It is important to emphasis that even the standard primigravida like any other primigravidae has longer duration of labor as compared to a multiparous woman. The rate of cervical dilatation is 1cm in 1 hour, thus time from the onset of true labour to completion of second

stage is approximately 10 hours. In contrast higher parity women have a cervical dilatation of 1.5 cm per hour (total length of labor being 8 hours). The active phase of labour takes an average of 8 hours in primigravida as compared to 6 hours in multiparous women. Active phase abnormalities including protracted and arrested cervical dilatation, arrest of descent and prolonged second stage are common and are reported in 25% of primigravida as compared to 15% of multiparous women[6]. Dysfunctional labor is commoner in primigravidae and is mostly due to hypotonic and uncoordinated uterine contractions.

Primigravida's pelvis has never been tested; that is, the functional capacity of the pelvis is unknown. The first labor is usually a trial and should be handled with caution. In contrast a parous woman has a known birth performance record (although it doesn't exclude her from other complications), and thus no much difference is expected to occur in relation to the bony pelvis.

The standard primigravida however is devoid of adverse outcomes associated with other primigravidae, contributed by extremes of maternal age, short stature and risk of cephalopelvic disproportion and medical complications which are known to increase adverse outcome for both the mother and the neonate. Risk of adverse neonatal outcome with neonatal Apgar score less than 7 at 5 minutes, neonatal unit admission and perinatal death is high in primigravid women as compared to low parity women.[5]

The concept of standard primigravida is relatively new and has been used in the past twenty years mainly in the Australia, American and European countries. It has shown to define a group within primigravidae with better maternal and neonatal outcome especially during the intrapartum events. This group is currently being used in these countries as a tool to assess performance of different obstetric units taking into account its similarities, and that they make at least 15% of the obstetric population, replacing the older tools like rate of Caesarian section delivery, rate of vaginal birth after a prior Caesarian section delivery (VBAC) and Perinatal death.

Some authors have described that, provided an uneventful course of pregnancy; primigravidity on its own does not warrant special precautions during delivery contrary to the traditional thinking[7]. The higher risk seen is rather attributed to primigravidae with variables that do not fit the standard primigravidae criteria. A primigravida with; height less than standard is associated with increased risk of caesarean delivery due to cephalopelvic disproportion, extremes of maternal age is associated with neonatal morbidity and higher rate of operative deliveries, lower gestation age and non vertex presentation are known to have poorer outcome as compared to term, vertex presentation. [1]

1.2 Literature review

Parity is a well recognized risk factor for feto-maternal outcome. Primigravidity has been associated with poor pregnancy outcome both for the mother and the neonate. Most of the studies however, have looked at the whole group of primigravidae with no further categorization into standard and non standard group.

The prevalence of primigravidity ranges between 33- 42% in different parts of the world. In a UK study by Cleary et al, standard primigravidae were found to be 42.6% of all the primigravidae and 18% of the overall obstetric population. In the study, standard primigravidae was defined as a 20 -34 year old woman, ≥ 155 cm in height, in her first pregnancy, at term with singleton vertex fetus with no known medical complication[1]. Similarly, another UK study which assessed impact of delivery guidelines on intrapartum care in standard primigravidae found the proportion of standard primigravidae to be 35.9% of all primigravidae and 14% of the entire obstetric population[3].

In Australia, primigravidae were found to be 40% of the obstetric population although they were not further subdivided into standard and nonstandard. Low parity women; para 1 and 2 were 33.6% and 16.7% respectively[4].

In Zimbabwe, it was found that the proportion of primigravidae was 32% and that of low parity women was 61%[5]. According to Tanzania Demographic Health Survey conducted in 2005, 33% of all deliveries in 2000 were primigravidae, and low parity women comprised of 52% [8]. According to MNH database in 2006, 38.9% of all deliveries were primigravid women and 52.5% were low parity women. There was, however, no data available on standard primigravidae.

Cleary et al studied performance of standard primigravidae and compared their pregnancy outcome among different obstetric units as a measure of obstetric care[1]. He looked at various obstetric outcomes and found that the performance of standard primigravida was significantly favourable compared to non-standard primigravida, although differences between units existed. The rate of caesarean section, postpartum haemorrhage, labour induction, neonatal morbidity was lower in the standard primigravidae group. The proportion of prolonged labour and instrumental vaginal delivery did not differ among the two groups. There was, however, a higher rate of obstetric trauma in the standard primigravidae group as compared to non standard primigravidae group, but the possible reasons for the difference were not speculated.

Majoko et al did a study to assess the relationship between parity and pregnancy outcome in a rural community in Zimbabwe. He reported a higher rate of overall obstetric complications in nulliparous women as compared to low parity women[5]. It was reported that 30.5% of all nulliparous women had one or more obstetric complications compared to 23% of women who were para 1, 2, and 3. The cited complications were pregnancy induced hypertension, antepartum haemorrhage, postpartum haemorrhage, perineal tear and premature rupture of membranes. Overall the nulliparous woman was found to have odds ratio of 1.74 (with 95% confidence interval 1.22-1.61) of developing any obstetric complication.

Another study done in Australia, which looked at parity and pregnancy outcome, found that primigravid women with vaginal delivery had a higher risk of perineal trauma as compared to low parity women (odds ratio of 3.92)[4]. A study by Angioli et al. in Miami USA, reported a

much lower rate of severe perineal injuries for both groups, although the rate was still higher in primigravids than in the low parity women (4.6% versus 0.75% respectively) [9]. Severe perineal injury in this study; was defined as occurrence of a third or fourth degree perineal tear. The odds ratio of having severe perineal injury was found to be 4.22 (95% CI 3.57-5.28) for primigravid women. This study excluded malpresentations and multiple pregnancies. In another UK study, Primiparity was found to be a significant risk factor for developing anal sphincter laceration; 10.7% of primigravid women sustained a severe perineal injury as compared to 2.2% of multiparous women[10].

Cleary et al found high rates of episiotomy and obstetric trauma among all primigravidae[1]. In another study by Alfirevic et al which compared pregnancy outcome among standard primigravidae between units with and without written guidelines for intrapartum care, it was reported that 30% of all standard primigravidae had an episiotomy and 1.3% had a third degree tear [3].

The incidence of instrumental vagina delivery has been reported to be higher among all primigravidae as compared to that found in women of higher parity. Roberts et al reported instrumental vaginal delivery rate of 21.9% among standard primigravid women and only 3.7% in low risk parous women[11]. This rate was similar to that found by Cleary et al in the standard primigravids study, where he found that both the standard primigravidae and the Non-standard primigravidae had an operative vaginal delivery rate of 22.7% and 23.9% respectively [1].

Caesarean section deliveries have been increasing among low risk obstetric population (term, singleton, vertex fetus). There is a higher rate of CS among primigravidae than the low parity group of women. Low risk primigravidae (standard primigravidae) have a three times increased risk of having an emergency CS than the low risk low parity women[11]. An overall caesarian section rate among standard primigravidae, in UK was reported to be 10% (with a

range of 7% -14% in the different study units) [1, 3]. The rate was 20.5% among Non standard primigravidae. Neither of the two studies looked at the indications for the caesarean sections.

Certain conditions have been associated with increased risk of developing postpartum haemorrhage. Primigravidity alongside grandmultiparity, preexisting anemia, prolonged labour, previous postpartum haemorrhage, multiple pregnancy and poly-hydramnios have been associated with an increased risk of postpartum haemorrhage. In a case control study done in Nigeria on singleton vertex deliveries; previous history of postpartum hemorrhage and prolonged labour were found to be the most important risk factors of developing PPH in a subsequent delivery. Primigravidity and grand-multiparity were not significantly associated with increased risk of postpartum haemorrhage [12].

The study on parity and pregnancy outcome by Bai et al reported an increased occurrence of postpartum haemorrhage among nulliparous women, with an odds ratio of 1.39 as compared to low parity group; 1 and 0.93 for Para 1 and 2 respectively. This study did not address the standard primigravidae[4]. Cleary et al reported that 11.6% of all standard primigravidae and 16.6% of non-standard primigravidae had postpartum haemorrhage. This difference was significant, no speculation done on the possible causes for the difference between these two groups of primigravid women. Similarly, Alfiveric et al found that 13% of standard primigravidae developed postpartum haemorrhage with a range of 10% - 17% among different maternity units [3].

Primigravidity has also been associated with poor fetal outcome compared to low parity women. Infants born to primigravid women; show a slightly higher rates of neonatal morbidity, need for neonatal unit admission and perinatal death as compared to infants of low parity women[4]. Bai et al reported that primigravid women had a 1.5 more risk of having an infant with low Apgar score at fifth minute of life and perinatal death than low parity women. This study, however, generalized all the primigravidae and thus the effect of gestation age and maternal diseases could have contributed to the higher risk observed[4]. Two studies on standard

primigravida reported that 1.1% to 2.2% of newborns from these women had low Apgar score (less than 7) at 5 minutes. A neonatal unit admission rate of 2.8% to 5.8% was reported for neonates of standard primigravid women in these studies. [1, 3]

2.0 Problem statement and Rationale

2.1 Statement of the problem.

Primigravid women comprise a third of the obstetric population worldwide as well as in our country (TDHS). Most studies have looked at this group as a high risk group for adverse pregnancy outcome. Few studies have addressed a subgroup of primigravidae, the standard primigravidae and found that they have better performance than other primigravidae in general.

Low parity women have been known to have most favourable pregnancy outcome when compared to other parities. Some authors have regarded this group as the referent group [4, 11]. Data comparing the obstetric performance of this better performer among general obstetric population to the standard primigravida, which is also a better obstetric performer among primigravidae is scarce, thus the need for a study comparing the standard primigravidae and low parity women.

It is well known that any pregnancy has a potential for complications, nevertheless, it is important to categorize different groups of obstetric patients for resource allocation and planning. Thus, it is important to conduct studies that may show that some groups, in this case, standard primigravidae group may be or is at a low risk as the low parity women group, so that scarce resources allocated to maternal and child care could be more focused on the real high risk group i.e. the non-standard primigravidae rather than the entire primigravidae population.

The pregnancy outcome of Standard primigravida women as a subgroup can be used as a tool of assessing quality of care in different hospitals as has been done in developed countries.

2.2. Rationale of the study

The aim of this study is to define the proportion of standard primigravidae at the Muhimbili National Hospital set up; their obstetric performance and outcome as compared to that of a known low risk group: the low parity women. The study will also introduce the concept of standard primigravidae at the MNH set up. The long standing misconception and prejudice that all primigravidae are high risk obstetric patients will be looked at. It is intended that, this study may show that standard primigravidae may be or are as low risk as the low parity women.

Hopefully, this concept can be extrapolated later to other health institutions in Tanzania and be used in day to day management and decision making in the labour wards and subsequently better management of the primigravid women with subsequent reduction of unnecessary interventions.

2.3 Null Hypothesis

There is no difference in pregnancy outcome among standard primigravidae and low parity women delivering at MNH.

3.0 OBJECTIVES

3.1 Broad objectives.

To determine the proportion of standard primigravidae among mothers delivering at MNH and compare their pregnancy outcome to that of low parity women delivering at MNH.

3.2 Specific objectives.

1. To determine the proportion of standard primigravidae among women delivering at MNH.

2. To determine the rate of emergency caesarean section and their indications among standard primigravidae and women of low parity delivering at MNH.

3. To compare the proportion of standard primigravidae and low parity women developing intra-partum and immediate postpartum complications (within 24 hours of delivery).

4. To determine the early neonatal outcome of standard primigravidae and compare them to that of low parity women.

4.0 METHODOLOGY

4.1 Study design

A Cross-sectional study.

4.2 Study Area

The study was conducted at Muhimbili National Hospital (MNH) general labour ward from 1st July to 31st December, 2007. The hospital is the largest Consultant and University teaching hospital in Tanzania and is a tertiary referral centre for the Dar es Salaam municipal hospitals.

Maternity services are provided in the Maternity building that consists of seven wards. During the study period Kibasila building was being used for the maternity services as the maternity building was under rehabilitation. Four wards serve as antenatal and postnatal wards each having a capacity of approximately 60 beds. The labour ward is located on the first floor of the building together with an immediate postnatal ward. There is a special room in the postnatal ward being used as an Intensive Care Unit for the very sick obstetric patients: those with severe pre-eclampsia, eclampsia and other severe conditions. One ward is used as the Neonatal Unit where all sick neonates from MNH, municipal hospitals and other peripheral hospitals receive care. Neonates delivered by Caesarean section where their mothers can not care for them immediately afterwards are also cared for.

The hospital's labour ward receives patients from three main municipal hospitals; Amana, Mwananyamala and Temeke and occasionally patients from nearby district hospitals like Kibaha and Mkuranga. Although the labour ward was designed for high risk patients referred from other centers, majority of women admitted are self referred coming directly from home after attending antenatal care at other health levels.

The capacity of the labour ward is twenty two beds. There are five to six nurses per shift in three shifts (morning, afternoon and night). There are about twenty to twenty five deliveries in a day.

The average number of deliveries per month is 600-800. Over the years, it has been observed that there are more deliveries from January - July as compared to August- December.

The daily staff of the labour ward comprises of Nursing Officers and Midwives. There are four doctors, of different cadres (from junior Intern doctor, Registrar/Resident, Specialist and Consultant) on duty daily. A teaching major ward round is conducted in the labour ward twice daily. In addition to the regular staff, a number of medical and nursing students are involved in daily routine and emergency patients' care.

All obstetric patients in labour, referred from other centers or coming as emergencies are admitted through the maternity block reception. A medical file is issued and the woman is escorted to the labour ward. At the labour ward admission room, a nurse records the particulars of the woman, takes vital signs and attaches a partogram on the file. The patients are then admitted to the labour ward through the labour ward admission room where routine procedures like registration, partogram filling and identification of risk factors are done. Measurement of blood pressure, height, weight, temperature and pulse rate, fundal height and absence or presence of fetal heart rates and documentation are done as per general labour ward procedure.

Once in the labor ward, the intern doctor/registrar/resident on call does a thorough physical examination with emphasis on pelvic assessment. Once labour is established, the findings are transferred on the partogram and management plan recorded according to the standard labour ward protocol after this initial assessment and management plan. Women not in labour are transferred to antenatal ward for further appropriate management.

Follow up of labour progress is done hourly by monitoring maternal blood pressure, pulse rate, frequency and duration of uterine contractions and fetal heart rate. Repeat pelvic examinations are done every four hours or earlier if needed. The findings are recorded in the partogram which is used to assess the progress. Further decisions are made accordingly.

All women were followed through labour by the on call team and intra-partum events recorded in the partogram as the routine. Women who delivered without complications are observed in the Post natal ward for six to twenty four hours before being discharged home. Those who have intra-partum or immediate postpartum complications are transferred to the admitting ward for further management, after initiating appropriate initial management. Women who deliver by Caesarean section are transferred directly from the theatre to the postnatal ward of the admitting firm.

4.3 Study Population

All parturient women admitted at MNH labour ward during the study period.

4.4 Sample size

The program Epi info 6 was used to calculate the minimum required sample size for the study. The following input values were considered:

95% confidence interval

80% power of the study

Ratio of low parity women : standard primigravidae **2:1**

Expected frequency of primary and secondary degree perineal tear for low parity women was 10% while that for standard primigravidae was taken as 17% *

The minimum required sample was **584** for the low parity women and **292** for the standard primigravidae. Total study sample was **876**

*MNH database 2006.

4.5 Sampling technique

All women within the definition of standard primigravidae within the study period were recruited into the study. For every standard primigravida recruited, the second and third low parity women were recruited.

4.6 Inclusion criteria

All primigravidae within the definition of "standard primigravidae" admitted in the labour ward as identified by the definition.

Low parity women, 20 years of age or more, with singleton, live, term fetus in vertex presentation admitted during the same period.

4.7 Exclusion criteria

A low parity woman with a prior caesarean delivery, previous adverse pregnancy outcome or has a recognized medical complication during this pregnancy.

4.8 Training of Research assistants

Four Nursing Officers underwent a one day training program by the Principal Investigator. They were trained on the objectives of the study, and on identifying the two groups for the study purpose. Much emphasis was placed on identifying antenatal problems and details of the previous pregnancy in low parity women and on proper questionnaire filling. The research nurses in the labour ward were arranged in such a way that one is available during the day and night.

4.9 Pilot study

A two week pilot study was done. The flow of variables in the questionnaire and ease of obtaining information was assessed. Necessary changes and omissions were corrected.

4.10 Study tools

A structured questionnaire was used to extract important information from the patient. The questionnaire was divided into four main areas; socio demographic information, antenatal and previous obstetric performance, intra-partum events and the fetal/ neonatal outcome

The individual's partogram were used at the end of labour for clarifications and extraction of important intra-partum events.

4.11 Data collection

Recruitment was done in the labour ward admission room by one of the research assistants. Standard primigravida were identified immediately on admission by the research assistants or the principle researcher and were recruited. Every second and third admissions in the labour room that fits the low parity criteria were also recruited as per sampling technique.

The study aim and benefit were explained to the participants and their consent sought. A verbal consent sufficed for this purpose.

The questionnaires were administered before delivery, as the women were admitted in the labour ward admission room. Name and registration number of participants were recorded for easy tracing. The files of participants were labeled for the same purpose. Other important information including gravidity, parity, gestation age and marital status, level of education and smoking habits and antenatal information like booking age, booking facility and number of antenatal visits made were recorder in the questionnaires. Low parity women were asked about their past obstetric histories and exclusions were made.

Gestational age was calculated from the Last Normal Menstrual Period if known using the Nagele's rule of calculating the expected date of confinement; by extrapolation from the booking fundal height or extrapolation from any available ultrasound report. For those women who did not have an ultrasound or were unsure of their dates Neonatal examination was done to determine gestation age at birth by Parkin's method (Appendix III).

The questionnaires were fully completed after delivery, using information from the partograph. This was done at the post natal ward were the mothers and their newborns are observed for 24 hours after delivery. For study participants who delivered by Caesarean section or encountered a complication; their questionnaires were completed in their admitted wards. The indication for CS, as documented in the operation notes were filled in the questionnaires. Other complications were also documented. Fetal maternal outcomes were recorded.

Participants who developed a complication or life threatening condition during labour or during early postpartum period received prompt and right management from the research team and the labour ward staff while the on call team was informed.

A close follow up of research activity was conducted by the principal researcher, where all the gaps and ambiguous issues were cleared promptly. Provision of logistics and research tools was done on daily basis. Data verification was done daily by the principal researcher.

4.11 Study variables

Maternal variables included socio-demographic data, reason for admission, status at admission, spontaneous or induced labour, and membranes status.

Maternal outcomes and complications included whether the labour was of normal or prolonged duration as assessed from the partogram, ante-partum haemorrhage, pre-eclampsia/eclampsia, oxytocin augmentation, episiotomy, severe maternal genital tract injury, occurrence of PPH, delivery mode and indication if delivered by caesarean section. Other adverse outcomes were occurrence of shoulder dystocia, cord accidents, uterine rupture, retained placenta and malposition.

Neonatal outcomes were birth weight and Apgar score at 1 and 5 minutes, presence of any other neonatal morbidity and admission to neonatal unit due to a morbid condition.

4.12 Data management

Data was coded, cleaned, validated and analyzed by the Statistical Package for Social Science (SPSS) version 15. Results were presented in cross tabulation tables. Chi square test was used to determine association of variables and p-value of less than or equal to 0.05 was taken to be statistically significant.

4.13 Ethical consideration

The participants were consent was sought and obtained after adequate information about all aspects covered by the study. Voluntary participation including the right to decline being in the

study or to withdraw their participation at any time they wish to do so was emphasized. They were ensured of receiving the same care whether they agree to participate or not. A signed consent form was not mandatory since the information obtained was routine and no invasive procedure was done to the participants.

Participants found to have a complication and life threatening condition received prompt and right management while the on call team was being informed.

Participants, who suffered a catastrophic event during this pregnancy such as stillbirth, and needed to be interviewed, were interviewed regarding their prior pregnancies by the Principal investigator where precautions were taken not to cause further distress.

There was minimal influence on patient care by the research team, since at the time of completing the questionnaire the complications and any interventions had already occurred.

Ethical clearance was obtained from the Research Ethics Committee of the Muhimbili University of Health and Allied Science and the Executive director of the MNH.

4.13 Limitations of the study

Some of information was not available due to incomplete partograph use especially the duration of different stages of labour.

The study was limited to immediate intrapartum events only and did not look into adverse outcomes like perinatal death, hospital stay for both the mother and infants or any other event arising thereafter.

5.0 RESULTS

A total of 4233 women delivered at Muhimbili National Hospital labour ward from 1st July to 31st December, 2007. Among these, 1773 (41.9%) were primigravid women, 1896 (44.8%) were women of low parity and 564 (13.3%) were women of higher parity. Among the primigravidae, 297 (16.7%) were standard primigravidae and 1462 (83.3%) were non-standard. Overall the proportion of standard primigravidae was 7.0% (297).

The study recruited 296 standard primigravidae and 479 women of the low parity group. One standard primigravida woman was excluded in the analysis.

Table 1 shows socio-demographic characteristics of the standard primigravidae and low parity women. Standard primigravidae, as expected, were of a younger age group (mean age 24.39 ± 3.639 years) as compared to women of low parity (mean age 27.73 ± 4.214 years). The age difference was statistically different (p- value <0.05). A statistically significant proportion of standard primigravid women were referred from other hospitals as compared to the low parity women (20% versus 14%, p-value 0.01). A higher proportion of standard primigravidae had a higher than primary level of education.

Table 2 shows obstetric characteristics of standard primigravid women and low parity women at admission. More of the women in the standard primigravidae group had induced labour as compared to those in low parity group, this difference was statistically significant (p value =0.028). Reasons for induction were documented to be draining at term and maternal perception of reduced fetal activity.

Table 1. Socio-demographic characteristics of the study population. (N= 775)

	Standard primigravidae n (%) (N=296)	*Low parity women n (%) (N=479)*	*p-value*
Age in years			
20-24	169 (57.1)	105 (21.9)	0.00
25-29	99 (33.4)	214 (44.7)	
30-34	28 (9.5)	159 (33.2)	
Marital Status			
Married	250 (84.2)	465 (96.9)	0.00
Single	46 (15.5)	14 (2.9)	
Education Level			
No formal education	5 (1.7)	16 (3.3)	0.05
Primary	156 (52.7)	285 (59.5)	
Secondary +	135 (45.6)	178 (37.2)	
Admission status			
Home	218 (73.6)	395 (82.5)	0.01
Antenatal ward	17 (5.7)	16 (3.3)	
Referred	61 (20.6)	68 (14.2)	

Table 2. Obstetric characteristics of the study population (N=775)

	Standard primigravida n (%) (N=296)	*Low parity women n (%) (N=479)*	*p-value*
Gestation age in weeks			
37- 39+	181 (61.1)	311 (62.8)	0.64
≥ 40	115 (38.9)	178 (37.2)	
Number of antenatal visits			
≤ 3 visits	26 (8.8)	69 (14.4)	0.02
> 4 visits	272 (91.8)	410 (85.6)	
PMCT status			
Negative	245 (82.8)	342 (71.4)	0.00
Positive	15 (5.1)	59 (12.3)	
Not checked	38 (12.2)	78 (16.3)	
Labour Onset			
Spontaneous	276 (93.2)	463 (96.7)	0.03
Induced	20 (6.8)	16 93.3)	

Table 3. Mode of delivery among standard primigravidae and low parity women. N=775

Delivery mode	Standard primigravida n (%) N= 296	low parity women n (%) N=479
Vaginal Delivery	231 (78.0)	408 (85.2)
Caesarean section	65 (22.0)	71 (14.8)

p =0.011

Table 3 shows standard primigravid women had a statistically significant higher emergency CS rate as compared to low parity women. *One woman in the standard primigravid group delivered by LCVE earlier during the study period but was excluded from the analysis as instrumental vaginal delivery was not practiced due to absence of proper working instruments.*

Table 4. Indications for emergency caesarean section delivery among standard primigravidae and low parity women. (n = 136)

Indication	*Standard primigravidae* *n (%)* *n= 65*	*Low parity women* *n (%)* *n=71*
Obstructed labour	16 (24.6)	20 (28.2)
Poor progress	14 (21.5)	12 (16.9)
CPD	15 (23.1)	9 (12.7)
Fetal distress	7 (10.8)	11 (15.5)
Malposition	7 (10.8)	7 (9.9)
Failed Induction	4 (6.2)	4 (5.6)
Others	2 (3.1)	8 (11.3)

p= 0.272

Caesarean section indications among the two groups were not statistically different as seen in Table 4. Other indications included PMCT1 status with premature membranes rupture, placenta praevia, early placenta abruption and congenital anomaly (hydrocephalic baby)

COLLEGE LIBRARY
MUHIMBILI UNIVERSITY
COLLEGE OF HEALTH SCIENCES

Table 5. Intrapartum and immediate postpartum complications seen among the standard primigravidae and low parity women.

COMPLICATIONS	*Standard primigravidae n (%) N=296*	*Low parity women n (%) N=479*	p-value
Oxytocin augmentation	182 (61.5)	128 (26.7)	*p = 0.000*
Prolonged labour**	76 (25.7)	70 (14.6)	*p =0 .003*
Fetal distress	33 (11.2)	26 (5.5)	*p =0.004*
Episiotomy rate *	32 (13.9)	4 (1.0)	*p = 0.00*
Postpartum hemorrhage	17 (5.7)	22 (4.6)	*p = 0.477*
Eclampsia/pre-eclampsia	3 (1.0)	5 (1.1)	*p = 0.961*
Severe genital tract Injury*	2 (0.9)	7 (1.7)	*p = 0.038*
Maternal death	-	2 (0.4)	
Ruptured uterus	-	1 (0.2)	
Others	5 (1.7)	8 (1.7)	*p = 0.983*

**rates taken among total number of vaginal delivery.*

Severe genital tract injury was taken as cervical tears, high vaginal tears requiring anesthesia for repair and third degree perineal tears.

Other complications included Abruption placenta, shoulder dystocia, Malposition and cord accidents.

**Women admitted in second stage and those without documentation were excluded from analysis.

There were statistically significant differences in intrapartum and immediate postpartum complications amongst the two groups as seen in Table 5. Standard primigravidae had higher rates of fetal distress, prolonged labour, oxytocin augmentation and episiotomies. Women in low parity group had higher rates of severe genital tract injury. Two maternal deaths occurred among the low parity women. The first maternal death was a 26 years old woman, gravida 3 with two prior normal vaginal deliveries admitted in active labour. On admission she looked exhausted but otherwise stable. The initial examination revealed poor fetal heart rate pattern and a decision to operate was reached. The intra-operative finding was a uterine rupture and she died during surgery. The second maternal death was a 31 years old woman, gravida 2 with one prior normal delivery. She was in good general condition on admission and had a good labour progress. She sustained a third degree perineal tear and died shortly after surgery.

Table 6. Early neonatal outcome among the standard primigravidae and low parity women.

Neonatal outcome	*Standard primigravidae n (%) N=296*	*Low parity women n (%) N=479*	*p value*
Birth weight (gm)			
< 2500	26 (8.8)	32 (6.7)	p = 0.482
2500-3500	224 (75.7)	359 (74.9)	
> 3500	46 (15.5)	88 (18.4)	
Apgar score at 5min			
≥ 7	263 (89.8)	455 (96.2)	p =0.001
< 7	30 (10.2)	18 (3.8)	
Stillbirth	3 (1.0)	6 (1.3)	p=0.021
Neonatal admission	41 (13.9)	30 (6.3)	p =0.00
Reason for admission			
Birth Asphyxia	30 (73.2)	17 (56.7)	p =0.05
Sepsis	4 (9.8)	5 (16.7)	
Respiratory distress	6 (14.6)	2 (6.6)	
Others	1 (2.4)	6 (20.0)	

Sepsis in the neonates was taken as those infants born from women with infected liquor or had conjunctivitis, cord sepsis and septic spots.

Other reasons for neonatal unit admission were congenital malformations and birth trauma; these included facial swelling in those infants with face presentation, soft tissue injury and brachial plexus injury during shoulder dystocia

Table 6 shows the comparison of early neonatal outcome among the standard primigravidae and women of low parity. The mean weight for the neonates among the standard primigravidae was 3056.82± 481gm and for low parity women was 3146 ± 481gm, this difference was not statistically significant.

A statistically significant proportion of standard primigravidae had neonates with low Apgar score at 5 minutes, stillbirths and neonatal admissions. Birth asphyxia was the leading cause of neonatal admission in both groups and was significantly higher among the standard primigravida.

Three neonates in the standard primigravidae and four from the low parity women died within few minutes of delivery. Among these, one neonate of a standard primigravidae had a good Apgar score but died within a short time of delivery. One was from the woman with ruptured uterus. The other five had very low Apgar score and could not be resuscitated. This was due to prolonged labour and cord accidents.

Table 7 Obstetric factors associated with low Apgar score

	Apgar score < 7 At 5th minute (%)	Apgar score ≥ 7 At 5th minute (%)	p-value
Duration of labour			
Prolonged	28 (58.3)	113 (15.7)	0.00
Normal	17 (35.4)	568 (79.1)	
Admission status			
Referred	25 (52.1)	99 (13.5)	0.00
Home	18 (37.5)	592 (82.5)	
Antenatal ward	5 (10.4)	27 (3.8)	
Delivery mode			
SVD	30 (62.5)	602 (83.8)	0.001
CS	18 (37.5)	116 (16.2)	
Birth weight (gram)			
< 2500	1 (2.5)	55 (7.7)	0.001
2500-3500	37 (77.1)	539 (75.1)	
> 3500	10 (20.9)	124 (17.3)	

Table 7 shows association of low Apgar score at the fifth minute of life and obstetric factors generally in all women. Neonates with low Apgar score were significantly associated with referrals and prolonged labour. More than seventy percent were of normal birth weight.

6.0 DISCUSSION

Obstetric patients have been divided into different risk categories in terms of performance and outcome of pregnancy by their parity. One such category is the primigravid women. This study aimed at defining a subgroup of primigravid women known as the "Standard primigravidae" and assessed their performance as compared to a low risk group of women, the "low parity women". The two groups of women are considered to have low risk of poor pregnancy outcome and are known to require minimum obstetric interventions[11, 13].

The study recruited 296 standard primigravidae and compared them to 479 of the referent group, the low parity women. The low parity women were twice the number of the former group; this aimed at increasing possible measured outcome in this low risk group.

In this study the standard primigravidae were found to be 7.0% of the total obstetric population, and 16.7% of all the primigravidae admitted during the study period. These figures were lower than those found in UK and US studies; 15% of total obstetric population, and 40% of all primigravidae [1, 3]. One of the reasons for the lower findings in this study could be that the study area was a tertiary hospital and that most standard primigravidae were more likely to have delivered at the municipal and other peripheral hospitals. A higher proportion of low parity women were admitted from home as compared to the standard primigravid women, who were referred from other hospitals. There are a significant number of adolescent pregnancies and short stature women along the coastal region which could have further reduced the number of the eligible study group. Overall the proportion of low parity women was similar to that seen in other studies within the region and worldwide [4, 5]

This study found a higher rate of emergency CS among standard primigravid women as compared to the low parity women. The overall rate of emergency caesarean section was 17.5%. A recent study done in the same hospital by Mselenge on emergency CS, evaluation of indications and pregnancy outcome reported an overall higher rate of emergency CS of 29.5%. This author did not look into different risk categories [15]. No specific data on

emergency CS rates was available for different groups such as standard primigravidae and low parity women without a prior CS in the hospital.

The emergency CS rate for standard primigravidae found in this study was still higher when compared to that in another study done at this same hospital by Lyamuya in 2002, which looked at obstetric performance of adolescent primigravidae in comparison to that of non adolescent primigravidae. The non-adolescent primigravidae were of the same age range as the standard primigravidae. They were found to have an emergency Caesarean section rate of 10.4%. Other characters like gestation age and vertex presentation, were not however, considered by Lyamuya[16]. Caesarean section rate among low risk primigravidae ranged from 7.9% to 17% in developed countries; still a lower value than the rate found in this study[1, 3, 17]. Other researchers reported a lower rate of emergency CS among the two groups; the standard primigravid women and low parity women. The risk of having an emergency Caesarean section, however, was three times more among the standard primigravidae as compared to that in women of low parity group [11, 18].

The high emergency CS section rate, seen in this study among both groups could be contributed to by several factors. One is the general increase in interventions among obstetric patients as projected by a report on Healthy people by 2010 [13]. The CS rate among low risk obstetric patients has increased to 27% in 2003. Another reason could be absence of instrumental deliveries at our centre during the study period. This contributed to a high proportion of women who could have been delivered by low cavity vacuum extraction to have an emergency caesarean section instead. The higher proportion of standard primigravidae with the indication of cephalopelvic disproportion could be another reason. A low parity woman is less likely to have an emergency Caesarean section due to CPD as her pelvis had already been tried and those with a prior caesarian delivery were excluded.

The major indications for emergency CS were obstructed labour, CPD, poor progress and fetal distress (excluding previous CS) which were similar to those found in prior studies in the same

area [15, 19, 20]. The rates of these indications were similar in both the standard primigravid women and low parity women with the exception of CPD.

Oxytocin augmentation during labour was seen 61.5% of standard primigravidae as compared to 26.7% of low parity women. Indications and effectiveness of augmentation was not recorded. These results matched those found in two other studies which looked at the intervention rates among low risk nulliparous [3, 18, 21]. Roberts et al reported lower rates of oxytocin augmentation among both groups; still the rate of augmentation was higher in low risk primigravidae [11]. This was not unexpected; primigravid women; regardless of their standard or non standard status, have higher rates of dysfunctional labour with hypotonic and uncoordinated uterine contractions. The diagnosis of uterine dysfunction is difficult to be made early in a busy ward. In the hospital different obstetricians use different approaches in caring for a primigravid woman in labour. Some of the obstetricians use Oxytocin augmentation more liberally than others and hence the high rate seen in this study.

The Standard primigravid group in this study had more than ten times episiotomy rate as compared to the Low Parity group (1.0% versus 13.9%). These rates, however, were lower as compared to other developing countries like Congo, Zambia, India, Tibet and Brazil where a rate of 90% in primiparous and 44% in multiparous women was observed [22, 23]. The low rate of episiotomy at MNH is consistent to the current recommendation of WHO is an episiotomy rate of 10% of all spontaneous vaginal deliveries[24].

This study found a low level of significant maternal genital tract injury in both standard primigravidae and low parity women. The overall rate of significant genital tract injury was 1%. There were two third degree tears and five cases of cervical tear with high vaginal tears in the low parity women. The findings reported in this study is contrary to many earlier studies were primigravidity is a risk factor for developing a third/fourth degree tear or extension of episiotomy to a third/fourth degree tear [1,9,10,11,14,25,26].

The rates of significant genital injury in this study, when viewed separately, give an impression that there are more injuries occurring in low parity women. The group is perceived to be of low risk and perceived to be capable to go through labour with less supervision. Such believes by the health professionals in the labour ward could have contributed to the higher occurrence of the injuries as compared to the standard primigravida who had more episiotomy and consequently less of severe genital tract injuries.

Absence of instrumental vaginal delivery and high rates of emergency caesarean section could also be contributing factors to a lower rate of significant genital tract injuries seen. The cases of severe genital tract injuries, however, were too few to make any significant interpretation.

The occurrence of other complications including occurrence of PPH and pre-eclampsia/eclampsia were not different among the two groups. Malposition, ante-partum hemorrhage, cord accidents, shoulder dystocia and ruptured uterus were very few for any comparison to be made

Two maternal deaths occurred among the study participants. Both were in the low parity group of women. One maternal death occurred in a low parity woman who sustained a third degree tear and had severe haemorrhage. She died shortly after surgery possibly due to massive haemorrhage. The second maternal death was due to ruptured uterus. Thus, maternal mortality amongst this group was extrapolated to be 423 per 100000 live births, still a big number taking into account their low risk status.

Bai et al. in the study on parity and pregnancy outcome have reported higher risk of neonatal morbidity among primigravid women [4]. This is consistent with our study finding of poor neonatal outcome among standard primigravida with more neonates having low Apgar score at fifth minute of life and more neonatal admission as compared to low parity women (10.3% versus 3.8%, p value 0.001 and 13.9% versus 6.3% p value 0.00 respectively). In developed countries neonatal outcome of standard primigravida alone showed lower proportions of

neonates with low Apgar score [1, 3]. The figures in our study are alarmingly high in both groups. The main concern is both groups were expected to have healthy neonates due to their low risk status and had quite healthy fetuses on admission based on physical examination and fetal heart rate pattern. More women in the standard primigravid group had prolonged labour and thus could have compromised the fetus and subsequently, the score at delivery. More of the standard primigravidae were also referred from other hospitals as opposed to low parity women and hence the better fetal status in the later group due to possible earlier interventions. Seventy three percent of the admitted neonates among those of standard primigravidae were admitted due to Birth Asphyxia as compared to fifty percent in the low parity women group.

Contrary to the expected results of good neonatal outcome in both groups as there was no questions of prematurity and few low birth weight babies (mostly associated with low score), this study showed quite a poor fetal outcome in both groups especially among the standard primigravida. One can speculate on many underlying causes for such alarming findings. One reason of the poor neonatal outcome could be lack of/inadequate intrapartum fetal and maternal surveillance and poor skills among the junior health care members in diagnosing and managing fetal distress despite the routine use of partograph. From personal experience and studies done at the hospital; the use of partogram is substandard. More of neonates with low Apgar score at fifth minute of life were delivered vaginally; their mothers had prolonged labour and were referred from peripheral hospitals. More than seventy percent of the neonates with poor Apgar score were of normal birth weight. Even the women diagnosed to have fetal distress and planned for emergency CS underwent several delays before the delivery including long delay in transfer to theatre and theatre space. Another reason could be poor maternal condition such as dehydration, poor efforts during second stage of labour and psychological unprepared-ness among the primigravida.

The high proportion of sick neonates in our hospital is of concern, and urges a need to look at the possible causes. The general labour ward at the study area was designed for a much smaller population and its facilities including the single emergency operating room appears

COLLEGE LIBRARY
MUHIMBILI UNIVERSITY

inadequate to deal with the workload. There are also the questions of referral time, decision to intervention interval and quality of intrapartum care for these women.

8.0 Conclusion

The standard primigravid women comprise a small percentage of the overall obstetric population at the MNH. They make eighth of the entire primigravida population in the set up. This study compared the performance of the standard primigravida women to the low parity women, both groups perceived to be low risk obstetric patients as compared to the general obstetric population. The standard primigravida had slightly higher adverse intrapartum events and poorer early neonatal outcome than the low parity women. On the contrary, the low parity women had more serious genital tract injuries and fatal complications including maternal deaths.

This study therefore; brings into light that no pregnancy should be regarded as low risk, and that obstetric complications can arise in any women, and may lead to grave consequences for the individuals, families and the health professionals. Facilities and health care professional have to be well prepared at all times to tackle such emergencies to ensure the health of our women and their neonates.

9.0 Recommendations

There is a need for a larger study to compare the performance of standard primigravidae, primigravidae in general and low parity women for a proper risk categorization. Until such a study reveals otherwise, all pregnancies should be regarded to have a potential of developing a life threatening complication. Emergency obstetric care facilities should be strengthened and be readily available at all levels.

There is also a need to have regular clinical auditing of the intrapartum care as a means of reducing maternal and neonatal morbidity and mortality and improve on maternal and newborn health.

10. References

1. Cleary R, Beard RW, Chapple J, Coles J, Griffin M, Joffe M et al, The standard primipara as a basis for inter-unit comparison of maternity care, Br J Obstet and Gynaecol 1996; 103: 223-229

2. Paterson CM, Chapple JC, Beard RW, Joffe M, Steer P, Wright CSW. Evaluating the quality of maternal service; a discussion paper. Br J Obstet Gynaecol 199; 98: 1073-8

3. Alfirevic Z, Edwards G, Platt MJ. The Impact of delivery suite guidelines on intrapartum care in standard primigravid. Eur J Obstet Gynaecol Reprod Biol 2004; 115; 28-31

4. Bai J, Wong FW, Bauman A, Mohsin M. Parity and pregnancy outcome. Am J Obstet Gynecol 2002; 186: 274-8.

5. Majoko F, Nystrom L, Munjanja SP, Mason E and Lindmark G. Relation of parity to pregnancy outcome in a Rural Community in Zimbabwe. Afr J Reprod Health 2004; 8(3)198-206.

6. Cunningham FG, Leveno KJ, Bloom SL, Hauth JC, Gilstrap III LC, Wenstrom KD. Williams Obstetrics, 22nd edition. USA: Mc Graw- Hill companies' Inc.1997.

7. Windschut HI, Social demographic factor, age, parity and ethnicity: High Risk Pregnancy and Management options. 2nd edition. UK: WB Saunders; 1999.

8. Tanzania Demographic and Health Survey, Ministry of Health 2004/05 at www.nbs.go.tz/DHS.

9. Angiolo R, Gomez-Marin O, Cantuaria G, O'Sullivan MJ. Severe perineal lacerations during vaginal delivery; the University of Miami experience. Am J Obstet Gynecol 2000; 182:1083-5.

10. Richter HE, Brumfield C, Cliver S, Burgio KL, Neely CL and Varner E. Risk factor associated with anal sphincter tear; A comparison of primiparous patients, vaginal birth after caesarian deliveries, and patient with previous vaginal delivery. Am J Obstet Gynecol 2002; 187: 1194-8

11. Roberts CL, Algert CS, Douglas I, Tracy SK and Peat B. Trends in labour and birth interventions among low risk women in New South Wales. Austr N Z J Obstet Gynaecol 2002,42:2:176-181

12. Selo-Ojemo DO, Okonofua FE. Risk factors for primary postpartum hemorrhage. Arch of Gynecol Obstet 1997; 259: 179-187

13. http:www.healthypeople.gov/publications (Accessed 22/05/07)

14. Lowder JL, Burrows LJ, Krohn MA, Weber A. Risk factors for primary anal sphincter lacerations; a comparison of cohorts by parity and prior mode of delivery. Am J Obstet Gynecol 2007; 196: 344

15. Mselenge HM. Emergency CS: Evaluation of Indications and Pregnancy outcome at Muhimbili National Hospital. A Dissertation for Master of Medicine in Obstetrics and Gynaecology, University of Dar es salaam, 2005.

16. Lyamuya R, Obstetric outcome among adolescent primigravid delivering at Muhimbili National Hospital. A Dissertation for Master of Medicine in Obstetrics and Gynaecology, University of Dar es salaam, 2002.

17. Main EK, Moore D, Farrell B, Schimel LD, Altman R J et al. Is there a useful caesarian birth measure? Assessment of the nulliparous term singleton vertex caesarian birth rate as a tool for obstetric quality improvement. Am J Obstet Gynecol 2006; 194, 1644-52

18. Carry AJ. Intervention rates in spontaneous term labour in low risk nulliparous women. Austr N Z J Obstet Gynecol 1990, 30(1):46-51

19. Kilama L, Indications and Fetal outcomes of Caesarean Section at Muhimbili Medical Centre. Obstetric long commentary, MMed dissertation in Obstetric and Gynaecology, University of Dares salaam,1998

20. Mawalla DG, Incidence, indication and outcome of CS at Muhimbili Medical Centre. Obstetric long commentary, MMed dissertation in Obstetric and Gynaecology, University of Dares salaam, 1983.

21. Svardly K, Nordstrom L, Sellstrom E. Primipara with or without oxytocin augmentation. J Clin Nurs 2007; 16,179-184

22. Graham ID, Carroli G, Davies C, Medves JM. Episiotomy rates around the world, an update. Births 2005, 32:3,219-223.

23. Kropp N, Hartwell T, Arthabe F. Episiotomy rates from eleven developing countries. Int J Gynaecol Obstet 2005, 91, 157-159.

24. World Health Organization. Care in normal births, a practical guide. Report of technical Working Group, Department of Reproductive Health and Research. Geneva: WHO 1999.

25. Carrol G, Belizan J, Stamp G. Episiotomy for vaginal births (Cochrane Review) in Cochrane Library issue 3, Oxford: update software, 2001.

26. Williams FLR, Florey C, Mines KJ and Ogslon. Episiotomy and perineal tears in low risk UK primigravidae. Journal of Public Health Medicine 1998; 20(4), 422-427