

**OBSTETRIC OUTCOME IN TEENAGE PREGNANCIES AT THE
UNIVERSITY TEACHING HOSPITAL, LUSAKA**

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**A DISSERTATION SUBMITTED TO THE UNIVERSITY OF ZAMBIA IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
MASTERS OF MEDICINE IN OBSTETRICS AND GYNAECOLOGY.**

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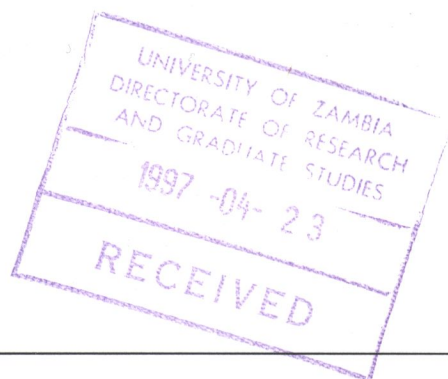
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1997



DEDICATION

I DEDICATE THIS WORK TO MY LOVELY DAUGHTER CHISANGA
WHO HAS BEEN AN INSPIRATION IN EVERYTHING I DO. MAY THE
GOOD LORD CONTINUE BLESSING HER.



ACKNOWLEDGEMENTS

I would like to sincerely thank my supervisor, Dr. Yusuf Ahmed for his advise and critique starting from the formulation of the research proposal, right through the actual study to the writing up of this final work. Without his help, this study would not have been easily achieved.

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Last but not least I would like to thank all my colleagues, family and friends for whatever help rendered and especially Charles for his encouragement and support throughout this study.

STATEMENT

I HEREBY STATE THAT THIS DISSERTATION IS ENTIRELY THE RESULT OF MY OWN PERSONAL EFFORT. THE VARIOUS SOURCES TO WHICH I AM INDEBTED HAVE BEEN CLEARLY INDICATED IN THE BIBLIOGRAPHY AND ACKNOWLEDGEMENTS.

SIGNED:.....

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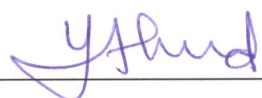
DECLARATION

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I HEREBY DECLARE THAT THIS DISSERTATION HEREIN PRESENTED FOR
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GYNAECOLOGY HAS NOT BEEN PREVIOUSLY SUBMITTED EITHER
WHOLLY OR IN PART FOR ANY OTHER DEGREE AT THIS OR ANY OTHER
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APPROVED BY: 

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APPROVAL

THIS DISSERTATION OF DR PRISCA NKOLE KASONDE IS APPROVED AS
FULFILLING PART OF THE REQUIREMENTS FOR THE AWARD OF THE
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ABSTRACT

The teenage period is between 12 and 19 years. Pregnancy in the teenager poses special social, psychological and medical risks both to the mother and her offspring. Because of the physical, physiological and emotional immaturity of the adolescent period, pregnant teenagers are prone to developing pregnancy induced hypertension, eclampsia, preterm labour, low birthweight babies, stillbirths, cephalopelvic disproportion and obstructed labour with its resultant complications.

This was a retrospective study at UTH over 1996 which looked at the incidence of teenage pregnancy and its obstetric outcome. The incidence of teenage pregnancy was 20%, and on the whole, the teenagers were found to have worse outcomes both for the mother and baby. The outcomes looked at were : mode of delivery, hypertensive disorders in pregnancy including eclampsia, low birthweight, stillbirths, asphyxia, ruptured uterus and maternal death. Teenagers had poorer maternal outcomes especially in terms of eclampsia, and had more instrumental deliveries. More of their babies had low birthweights, severe birth asphyxia and more were stillborn. Maternal death and ruptured uterus however were not significantly different from the older women.

From these results recommendations have been made to followup with a prospective study that should look at, among other things, the different possible confounding factors; need for sex education to teenagers; accessibility of family planning and antenatal care services to teenagers and dealing with obstetric problems promptly when they do occur to avoid severe complications.

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ABBREVIATIONS

APH	-	Antepartum haemorrhage
A/S	-	Apgar score
CI	-	Confidence Interval
DHS	-	Demographic and Health Survey
FSB	-	Fresh stillbirth
MSB	-	Macerated stillbirth
OR	-	Odds ratio
PPH	-	Postpartum haemorrhage
SIDA	-	Swedish International Development Agency
SAREC	-	Swedish Agency for Research Cooperation
UTH	-	University Teaching Hospital
WHO	-	World Health Organisation

INTRODUCTION

Adolescence has been defined differently by various authorities. World Health Organisation (WHO) has defined it to mean the period between 10 and 19 years of age (WHO, 1989). Teenage period in standard English usage generally means between thirteen and nineteen years. For the purpose of this study adolescence and teenage are considered synonymous and will mean nineteen years and below.

Adolescence is a period in which there is a complex interplay of physical, mental, psychosocial and behavioral development. Sometimes these normal developments may go wrong and result in several complications. Teenage pregnancy is a case in point. Teenage pregnancies have been associated with poor obstetric outcome, both in terms of fetal and maternal morbidity and mortality, as compared to the non-teenage population. Teenage pregnancy is said to be quite common worldwide. In England and Wales a sevenfold increase in the number of pregnant fifteen year olds had been documented since 1950 (Russel, 1983) with incidences of 44 per 1000, compared to 96 per 1000 in the USA and 14 per 1000 in the Netherlands (Bury, 1985). Direct obstetric complications of early childbirth include obstructed labour, hypertensive disorders of pregnancy, in particular pre-eclampsia and eclampsia, obstetric fistulae and indeed maternal death. The infant of a very young mother has a lesser chance of survival because of low birthweight and birth asphyxia. Because of the low birthweight they are also more susceptible to infection and illness in general than heavier infants.

There are biological, psychological, socio-demographic and behavioral factors that could influence the outcome of a teenage pregnancy:-

- Lack of information and access to family planning services leading to teenage pregnancy and its consequent adverse outcome.
- Being single and at school, the teenager may hide the pregnancy and therefore not utilise the available antenatal care services. She may also interfere with the pregnancy late in gestation for the same reason and end up with life threatening complications like uterine perforation, sepsis and even death.
- Underdeveloped pelvis because of the young age. The pelvis develops fully only when a girl has attained her full stature. If a young girl gets pregnant, she could therefore end up with cephalopelvic disproportion during labour and subsequently obstructed labour and its sequelae of sepsis, vesicovaginal fistula, fetal and maternal death - especially if appropriate health service intervention is not rendered timely

There is an impact not only on the health of the teenager herself, especially her future reproductive ability, but also on the cost of provision of health services in that institution or community that has to deal with some of the severe complications mentioned above. Apart from the physical health risks to the mother and baby, early childbearing also tends to restrict educational and economic opportunities for women who are already compromised to those opportunities. On top of that, in certain communities pregnant teenagers are stigmatised and this may retard the development of self-esteem which is very important for one to succeed in any endeavour, be it at school, work or socially. To address the issue of teenage pregnancies, data is needed which reflects the objective reality. Data on teenage pregnancy and its complications are inadequate, particularly throughout the developing world, including Zambia, hence the need for undertaking this study.

LITERATURE REVIEW

Incidences and Rates

Pregnancy rates among adolescents worldwide are increasing even though the general fertility is declining among women (Senanayake and Ladjali, 1994). In Zambia, the total fertility rate has declined slightly in the last 15 years; in 1992 it was 6.5 (Gaise et al, 1993). In certain parts of Latin America and Africa, 30 - 40% of all adolescents experience motherhood before the age of 18 (Boult and Cunningham, 1995). One in five girls in Kenya get pregnant each year while in Dar-es-Salaam, Tanzania, teenage pregnancies account for 22% of all deliveries (Lee and Made, 1994). In Zambia one third of women have born a child by the time they are 19 (Gaise et al, 1993). The Zambian 1992 demographic and health survey found that the median age of first intercourse in 16.3 years for women. It also found that by 15 years of age, five percent of the teenagers have begun childbearing (Gaise et al, 1993). Comparative national figures by Bury (1985) showed that the incidence of teenage pregnancy (15-19 years) ranges between 96 per 1000 in USA, 14 per 1000 in the Netherlands and 44 per 1000 in England and Wales.

Problems of abortion

The problem of unwanted pregnancy may arise at any age but more so in the teenager who is likely to be unmarried and still at school. She is likely to seek abortion either legally or illegally, often in the second trimester. Teenagers aged 15-19 account for ten percent of the 50 million induced abortions that occur throughout the world (Senanayake and Ladjali, 1994). They also tend to hide their pregnancies and interfere with it late in gestation making them liable to life threatening complications like uterine perforation, sepsis and death. In Zambia, Chatterjee in 1985 found an incidence of 26% induced abortions in teenagers at the University Teaching Hospital (UTH) with 5% of them being under 15 years.

All but one of the under fifteens sought termination of pregnancy late - i.e. after the twelfth week. Charterjee's study highlighted the inexperience of the very young in recognising the symptoms of pregnancy, their ignorance about where and when to go for help and advice and their hesitation to confide in their elders. Narone at UTH also found that septic abortions were significantly higher in teenagers as compared to those between 25 and 29 years (Narone, 1983). According to a WHO report (1983), abortion contributed to 17% of all maternal deaths in 1983. If the pregnancy is allowed to proceed, it is more likely to present with complications than in their non-teenage counterparts. Factors leading to this are: early marriage, urbanisation, premarital sexual experimentation, declining age of menarche and lack of knowledge and access to family planning services (Fahthalla, 1991; Leading article- Lancet, 1969).

Although the 1992 Zambia demographic and health survey showed that teenage pregnancies are common in Zambia (Gaise et al, 1993), little research has been done on the subject of obstetric outcome in teenagers as a whole. The Chatterjee study (1985) mentioned above looked only at the socioeconomic and demographic characteristics of induced abortions. Narone in 1983 also only studied spontaneous abortions in Zambia.

Maternal and fetal outcomes

A retrospective study in Mozambique evaluated the perinatal outcome of teenage pregnancies in comparison with the population of older high risk deliveries (Bacci et al, 1993). Clinical records of 15,207 high risk deliveries were analysed. Of these, 2,185 were teenagers aged less than 19 and it was found that stillbirth rates, frequency of operative vaginal deliveries and caesarean sections were higher amongst teenagers.

A comparative analysis of some aspects of obstetric outcomes in black teenagers in two hospitals in Port Elizabeth, South Africa, found significantly higher incidences of anaemia and low birthweight amongst teenagers compared to their older counterparts. No significant differences were found with other obstetric variables however (Boult and Cunningham, 1995). Another earlier study on white women in Capetown, South Africa also showed that the incidence and severity of pre-eclampsia and prematurity was higher in teenagers (Utian, 1967). The prematurity rate was higher in teenagers. The prematurity rate in teenagers was 7% whereas it was only 2% in their controls. The pre-eclampsia incidence was 21% (36% including all other hypertensive disorders) as compared to 17% in the control group. The sample size in this study was 100 teenagers below the age of 16 and 100 controls aged 22 years (Utian 1967).

In Nigeria, more than half the pregnancies in teenagers were found to be associated with complications (Harrison, 1985). These included anaemia, pre-eclampsia, eclampsia and antepartum haemorrhage. Harrison further showed that the youngest and shortest Nigerian women had the highest prevalence of contracted pelvis, cephalopelvic disproportion and operative deliveries. Diejomoah et al (1980), at Benin Teaching Hospital in Nigeria, found an incidence of 31.4% teenagers. In this group pre-eclampsia and eclampsia were higher than in any other age group. The incidence of eclampsia was higher in unbooked than booked cases and they concluded that prenatal care is important in the prevention of eclampsia especially in the primigravids. Another study by Rossiter et al (1985) in Nigeria showed that fetal and maternal survival were poorest among primigravids less than 15 years of age. Whereas the young teenagers (up to 15 years of age) constituted only 6% of the population survey, they constituted 30% of the 174 maternal deaths in that series. Perinatal deaths rates per 1000 singleton deliveries were 180 for the young teenagers and under 100 for the others (excluding the highly parous women above 30 years who had a rate of 150) (Rossiter et al, 1985).

Donaldson in an Editorial in 1973 analysed causes of infant mortality and found neonatal and infant mortality rates of 21.6 and 35.5 per 1000 live births respectively in young mothers less than 20 years of age and a rate of 21.5 and 19.6 for all the births together (Editorial, 1973). The mean birthweight of neonates delivered from teenagers was on average 200 grams lower when compared to neonates delivered from the age group of 20-29 in the Nigerian series (Harrison, 1985). The proportion of low birthweights was also found to be two to three times higher in teenagers (Lewis and Nash, 1967; Editorial, 1971; Harrison, 1985; Freidman, 1994).

Another study in Salt Lake City, USA was undertaken to determine whether young age confers an intrinsic risk of adverse pregnancy outcome (Fraser et al, 1995). Stratified analysis of 134,088 primigravid white girls and women aged 13-24 was performed. Relative risks for subgroups of this study population were examined to eliminate the confounding influence of marital status, educational level and the adequacy of prenatal care. They concluded that a younger age does indeed confer a risk of adverse pregnancy outcomes that was independent of other confounding socio-demographic factors.

In the Netherlands a retrospective study comparing the course of 4,500 teenage pregnancies with that in women aged 20-29 years of age showed that teenage pregnancies had less favorable outcomes than those in older women (Buitendijk et al, 1993). The outcomes measured were low birthweight, preterm births, and intrauterine fetal deaths.

Similar results of worse outcomes were also found by Jacono et al in a study in Ontario, Canada (Jacono et al, 1992). Freidman in his study in 1994 also showed that the risk of death from a teenage pregnancy and childbirth is twice higher in comparison to women aged 20-30. In the Nigerian series by Rossiter et al in 1985, though young teenagers constituted only 6% of the total survey, they accounted for 30% of all the maternal deaths.

Moreover, if they survive the ordeal of labour, the teenager is prone to develop severe complications like the socially incapacitating vesicovaginal and rectovaginal fistulae.

Out of 751 cases of vesicovaginal fistula which occurred in primiparous women, 581 (77%) were in teenagers (Mahfouz, 1995). The severity of the lesions was also worse in teenagers. Whereas 76% of the under 16 year olds had vesicovaginal fistula only, 17.1% had vesicovaginal and rectovaginal fistulae at the same time and the remaining 6.3% had on top of that a perineal tear. However in those aged 17-30 years, 84% had vesicovaginal fistulae only and only 14% had both vesicovaginal fistula and rectovaginal fistula and just 1.7% of them had a tear apart from the two fistulae.

Suicide has also been found to be a real risk in the teenage pregnant girl due to the emotional disturbance brought about by the pregnancy (Editorial, 1971).

Effect of prenatal care on obstetric outcomes

Much as the teenagers are said to have less favourable outcomes, some literature on teenage pregnancy and childbirth suggest that prenatal care can considerably reduce the risks. The obstetric performance of Nigerian primigravids aged 16 or under who received inadequate prenatal care was compared to those who had adequate care and additionally to another group of primigravids aged 22 years (Efiong and Banjoko, 1975). Incidences of pre-eclampsia, eclampsia, and low birthweight were higher in the teenage group and more so in those that had inadequate prenatal care.

Earlier, 103 teenagers were studied by Lewis and Nash in 1967 in Nigeria and it was found that although pregnancy presents some grave sociological problems, labour itself normally proceeds well. The caesarean section rate was only 4% as compared to 6.5% for the whole hospital. Forceps delivery rate was 10% and easy vaginal delivery was the rule.

This was in contradiction to other studies (Harrison, 1985). Stearn (1963) also found such contradictory outcomes in his study of 30 patients. There were no caesarean sections done even though 17% of the babies had birth weights of more than 4kg.

Outside Africa, the health profile of pregnant teenagers in comparison with non-teenagers was studied in Saudi Arabia and they concluded that pregnant teenagers were not a high risk group if good antenatal care is provided (Mahfouz et al, 1995). Similar observations were made in a clinical study of pregnancy in 163 young teenagers in Liverpool, England (Elliot and Beazley, 1980). Although prematurity remained a problem, many of the other hazards were the same as in the general population. It was however emphasised that this observation probably reflects the better antenatal care which that group of patients received.

In the USA, Phipps-Yonas (1980) reviewed over 250 articles on teenage pregnancies in medical, public health and social work journals dealing exclusively with the USA and revealed that, with minor exceptions, pregnant teenagers who are fifteen or older and who receive satisfactory prenatal care and nutrition are not at risk for obstetric difficulties. Molina et al (1985) in Chile also found similar results - that an adequate medical care programme for adolescents can contribute to reducing maternal and perinatal risks.

STUDY JUSTIFICATION

From the studies, including those from Africa, one can infer that pregnancy in a teenager is physically and mentally damaging, especially if there is not enough social, psychological support and prenatal care. Recent studies reflecting the obstetric outcome of teenagers in Zambia are lacking. The aim of this study therefore is to assess the obstetric outcome in teenagers here in Zambia and the University Teaching Hospital in particular. The results of this study will help to base any future interventions in safeguarding the reproductive health of teenagers in our institution in particular and the country as a whole.

RESEARCH QUESTIONS

1. What is the incidence of teenage pregnancy in the total pregnant population delivering at the University Teaching Hospital?
2. What is the age-gravidity distribution in teenage pregnancies?
3. Are there more delivery complications in teenage pregnancies as compared to non-teenagers ?
4. Is perinatal morbidity and mortality higher amongst teenagers than their non-teenage counterparts ?
5. Is maternal morbidity and mortality higher in teenagers than non-teenagers?

OBJECTIVES

Broad Objective.

To determine the extent and association of teenage pregnancies with poor obstetric outcome.

Specific Objectives

1. To determine the incidence of teenage pregnancies among the total pregnant population delivering at the University Teaching Hospital.
2. To determine the age-gravidity distribution of teenage pregnancies.
3. To establish whether there are more complications in teenagers than non-teenagers e.g. more instrumental and operative deliveries, hypertension, eclampsia etc.
4. To establish whether there is a difference in the mode of delivery between the teenagers and non-teenagers.
5. To find out whether perinatal morbidity and mortality is higher amongst teenagers than their non-teenage counterparts e.g. low birthweights, stillbirth etc.

HYPOTHESES

1. Teenage pregnancies are associated with poor obstetric outcome.
2. There are more delivery complications in teenagers than non-teenagers.
3. There is a higher rate of perinatal and maternal morbidity and mortality amongst teenagers than non-teenagers.

METHODS

An institutional based retrospective study of the obstetric outcome of teenage pregnancies at the University Teaching Hospital as compared to their non-teenage counterparts was undertaken. Approval was obtained from the Research and Ethics Committee of the University of Zambia. There were 13,065 deliveries at the University teaching Hospital during the period January 1st to December 31st 1996. 12,688 of the women who delivered at UTH had their ages indicated and were included in the study. Data on these 12,688 were collected from the labour ward admission and delivery books, emergency obstetric theatre books and labour ward special observation unit admission books.

Age distribution of all deliveries:

The ages of all women who delivered were stratified according to age. From that the incidence of teenage pregnancy (i.e. less than or equal to 19 years of age) at the UTH was calculated. The results were presented in tabular and graphic form.

Age - gravidity distribution in teenagers :

The age-gravidity distribution of all the teenagers was collated by determining for each age the number who were in their first or subsequent pregnancy.

Various outcomes listed below were analysed with respect to whether they were teenagers or non-teenagers.

- a. Mode of delivery: Caesarean section rates, vacuum and forceps delivery rates.
- b. Incidence of hypertensive disorders in pregnancy including eclampsia.
- c. Incidence of ruptured uterus.
- d. Maternal deaths and the causes in the teenagers.

Fetal outcomes that were analysed were:-

- a. Incidences and rates of stillbirths
- b. Types of stillbirths - fresh or macerated
- c. Severe birth asphyxia, - Apgar score less than five
- d.. Low birthweight less than 1.5 kg
- d. Weight between 1.5 and 2kg.
- e. Excessive birthweights more than 4kg.

For each group, the relevant outcome was collated in a 2 x 2 contingency table. The information was extracted from inspection of the registers mentioned above.

e.g. eclampsia

	With eclampsia	Without eclampsia	Totals
Less than or equal to 19 years	66	2530	2596
Greater than or equal to 20 years	78	10014	10092
Totals	144	12544	12688

From this contingency table the chi square and p-value of the significance were calculated, as were the odds ratios (with the 95% confidence intervals). This analysis was done using Epi Info version 6.

Working definitions

- a. Teenager/ Adolescent - Unless otherwise specified, teenager, meaning up to and including 19 years of age, is used in this dissertation.
- b. Maternal Mortality - Death of a woman while she is pregnant or within 42 days after her pregnancy ends including deaths from abortions (WHO definition)
- c. Perinatal Mortality - All stillbirths and neonatal deaths i.e. deaths of babies in the first seven days of delivery

RESULTS

Age distribution

During the period January 1st to December 31st 1996, there were 13,065 deliveries at the University Teaching Hospital. Out of the 12,688 who had their ages indicated, 2596 (20%) were teenagers (19 years or less) (Table 1 and Figure 1), and 505 (4%) were 16 years and less (Table 2 and Figure 2).

The age distribution ranged from 12 years to 48 years . The mean was not calculated as only age groupings were used for the distribution. In the analysis of the age-gravidity distribution of the teenagers it was found that the majority of them were in their first pregnancies i.e. 83.8% of them were primigravidas while 13.7% and 2% of them were already in their second and third pregnancies respectively. One of the teenagers was in her fifth pregnancy - she was 19 years of age (Table 3 and Figure 3).

The following were comparisons made between teenagers and the rest of the mothers delivering at UTH in relation to various outcomes :-

Mode of Delivery

Of the 2596 teenagers, 348 of them (13.4%) were delivered either by caesarean section, vacuum extraction or forceps delivery (Table 4). Of those who had operative or instrumental deliveries, 222 teenagers below or 19 years of age were delivered by caesarean section, as compared to 1077 of their non-teenage counterparts. The odds ratio was 0.78 ($0.67 < OR < 0.9$) indicating that the teenagers were less likely to have caesarean sections than their non-teenage counterparts. For vacuum and forceps deliveries, 103 and 21 teenagers respectively were delivered by these modes while 167 and 19 non-teenagers were delivered by vacuum and forceps respectively.

Odds ratios were 2.46 ($1.9 < OR < 3.18$) for the vacuum and 4.32 ($2.23 < OR < 8.40$) for the forceps deliveries. The p-values were less than 0.000001 for both vacuum and forceps deliveries - very highly significant (Table 5).

Eclampsia

Of the 144 cases of eclampsia during 1996, 66 (45.9%) were in teenagers - that is 2.5% of the total pregnant teenage population at UTH. The remaining 78 (54.1%) were in the non-teenagers - comprising only 0.7% of the total number of non-teenagers in this study (Table 6). Further computed analysis brought out a highly significant odds ratio of 3.35

($2.38 < OR < 4.72$), chi square 57.52 and p-value of 0.00000001- (Table 7), meaning teenagers had more risk of eclampsia than others. The rest of the hypertensive disorders in both the teenagers and non-teenagers did not show significant difference. 6.9 % of teenagers and 7.3% of non-teenagers had hypertension (Table 6 and 7).

Apgar Scores of the Newborn

As shown in Table 8, fresh stillbirths as an outcome is almost of a similar rate in both the teenagers and older mothers. Odds ratio was 0.89 ($0.65 < OR < 1.21$), chi square 0.62 and p value 0.432. However, macerated stillbirths and severely asphyxiated babies (Apgar score less than 5) were significantly higher in teenagers than their older counterparts. The odds ratio was 1.42($1.14 < OR < 1.76$), chi square of 10.67 and p-value of 0.001 for macerated stillbirths and odds ratio 1.54 ($1.26 < OR < 1.87$), chi square 19.62 and p-value of 0.0000094 for severely asphyxiated babies (Table 9).

Low Birthweight

Teenagers had more babies with low birthweight. 193 (29.6%)of all the babies with birthweights below 1.5kg were to teenagers - i.e. 7.4% of the total teenage population, as compared to the remaining 459 (70.4%) - i.e. 4.5% of the total non-teenage population. 208 (27.8%) babies weighing between 1.5 and 2kgs were to teenagers while 540 (72.2%) were to their older counterparts (Table 10). The difference is statistically significant as shown by the odds ratios , chi square and p-values in Table 12.

Excessive Birthweight

For babies with birthweights of over 4kg however, the teenagers had the least, only 7(4.1% of the heavier babies) out of the 2596 - that is 0.3% of the total teenage population as compared to 165 (95.9% of the heavier babies) out of 10,092 - that is 1.6% of the total non-teenage population (Table 11). The difference is highly statistically significant (Table 12).

Ruptured Uterus

No significant difference was found in the cases of ruptured uterus between teenagers and non-teenagers. There were 25 cases of ruptured uterus in 1996. 2 (8%) were in teenagers (i.e.0.07% of the total teenage population). The 23 (92%) non-teenagers who had ruptured uterus were only 0.2% of their total population in the study (Table 13). Statistically therefore, there is not much difference - odds ratio is 0.34 ($0.06 < OR < 1.47$), chi square 2.39 and p-value of 0.122 (Table 7).

Maternal Death

Out of the 105 cases of maternal deaths recorded at UTH, 17 were teenagers i.e. 16.2% of all deaths as compared to 88 (83.8%) non-teenagers (Table 14). There was no statistically significant difference (Table 7). It was noted that 10 (58.8%) of the deaths in the teenagers were due to malaria while eclampsia was responsible for 3 (17.6%) of the deaths. The other causes of death were postpartum haemorrhage, chorioamnionitis, peritonitis, and Guillan-Barre syndrome which contributed 1 (5.8%) each (Table 15).

Analysis of outcomes in teenagers up to the age of 16

A further breakdown of the teenagers 16 years and below compared those 17 and above. In this analysis statistical significance was found in the following outcomes:-

- a. Low birthweights
- b. High birthweights
- c. Eclampsia

The rest of the outcomes did not yield any differences (Table 16).

DISCUSSION

Almost 20% of all deliveries in this study were attributed to teenagers. This is similar to what has been found in other studies in the region. Teenagers accounted for 20% of all the delivered in Dar-Es- Salaam, Tanzania, while one in five girls in Kenya get pregnant each year (Lee and Made, 1994).

There were 3 teenagers in this study who were 12 years old - the youngest. Even though the majority of the teenagers (2172 i.e.83.8%) were only in their first pregnancies, 358 (13.8%) were in their second pregnancies. Of these, 34 (1.3%) were actually below 16 years. In fact two 15 year olds were already in their third pregnancies, while one 19 year old was in her fifth pregnancy (table 3). Another age-gravidity distribution done at the UTH in 1992 found almost similar figures - 2662 i.e. 75% of those below 19 years were in their first pregnancy, 516 i.e.19.3% in their second pregnancy and 4 (0.1%) 16 year olds were already in their third pregnancy (Malama, 1992). This would have a bearing on their health as it reflects lack of spacing of their pregnancies with consequent anaemias, low birthweight babies etc. They would also end up being grandmultips early in their twenties or thirties as they are still young and productive.

Grandmultiparity would predispose them to iron deficiency anaemia, postpartum haemorrhage and ruptured uterus. Fuchs et al (1985) found that postpartum haemorrhage is more common and ruptured uterus up to 20 times more common in these groups of grand multips. At the Riyadh Armed Forces Hospital, Mesleh (1986) in an analysis of 12,636 consecutive deliveries found that 8.7% were to women in their eighth or subsequent pregnancy. There was no case of ruptured uterus in this group but there was one maternal death.

The incidence of breech, unstable lie, cord prolapse, multiple pregnancy, caesarean section, postpartum haemorrhage and antepartum haemorrhage due to placental abruption were particularly common and increased with parity .

In this study at UTH, in the analysis of the various outcomes which were under study, it was found that there were significant differences in the mode of delivery between teenagers and non teenagers. Teenagers were less likely than their older counterparts to be delivered by caesarean section. However they had significantly higher incidences of forceps and vacuum extraction deliveries even when the instrumental deliveries were combined (Table 5). This is almost similar to what has been found by Stearn (1963) who had no caesarean sections and also by Lewis and Nash (1967) who had only 4% respectively in their series.

Another outcome which was significantly high in teenagers was eclampsia. Of the 144 cases, 66 (45.8%) and 78 (54.2%) were to teenagers and non-teenagers respectively. They represented 2.5% and 0.7% of their respective total populations. The odds ratio was 3.35(2.38<OR<4.72), chi square of 57.52 and p-value of < 0.00000001 (Table 7). In an earlier analysis of 110 cases of eclampsia at the UTH in the period of September 1993 to September 1994, it was found that 58.2% were to women up to the age of 20 years (Brock, 1994). Out of 12 deaths due to eclampsia in this Brock's series, 75% were to women below and up to 20 years - a very high figure compared to the older women. This has also been found in studies in Cape Town, South Africa and Nigeria (Utian, 1967; Harrison, 1985).

Low birthweight as an outcome was also statistically significantly higher in teenagers than non teenagers (Table 10 and 12), just as has been shown in other studies (Fuchs et al, 1985 Buitendijk et al, 1993). This would probably be explained by the fact that they are smaller and therefore their babies will be smaller. Furthermore, being at school or unmarried, they might hide their pregnancies and not utilise the antenatal care services.

Consequently anaemias, syphilis or any other conditions that may lead to low birthweight or intrauterine growth retardation are not picked up early and treated where possible. They are also prone to pre-eclampsia which may also lead to intrauterine growth retardation and low birthweight as well.

For birthweights of over 4kg however, the older women had significantly higher numbers - 1.6% for them as compared to only 0.3% in the teenagers (Tables 11 and 12).

Macerated stillbirths and severe birth asphyxia were more common in teenagers than non-teenagers in this study with odds ratios of 1.42(1.14 <OR< 1.76) and 1.54(1.26<OR<1.87) respectively (Tables 8 and 9). Poor antenatal attendance may be a factor here and teenagers are usually poor users of antenatal care services. As a result syphilis and other infections, which can cause intrauterine fetal death are not picked up and treated early.

Hypertensive disorders like pre-eclampsia or eclampsia also can be contributing factors to these fetal deaths. Teenagers, and primigravida in particular, are particularly prone. Similar results of poor fetal survival have been shown by Rossiter et al in Nigeria (1985). The perinatal death rates were 180 per 1000 singleton deliveries in teenagers as compared to 100 per 1000 in non-teenagers. In Mozambique, Bacci et al (1993) found higher stillbirth rates as well in teenagers.

Two teenagers had ruptured uteruses. Their non-teenage counterparts had 23. Though statistically not significantly different, one would postulate that being a hospital based study, all cases of suspected cephalopelvic disproportion or obstructed labour were dealt with promptly by way of delivery by caesarean section. Those with mild disproportion would have been delivered by instrumental delivery. Being a retrospective study such details were not available from the delivery books. Because of the poor record keeping, it was not possible to get records for all the patients.

There were 105 cases of maternal deaths in this series. Of these, 17 (i.e. 16.1% of all deaths) were teenage maternal deaths. The main causes of death were malaria - 10 patients, followed

by eclampsia with 3 patients. PPH, chorioamnionitis, peritonitis and Guillan-Barre syndrome accounted for one each (Table 15). So teenagers were not at particular risk to maternal death (Table 7) contrary to other studies like the one by Rossiter et al in Nigeria (1985) who found a 30% death rate in teenagers even though they comprised only 6% of the study population.

On the whole, even in this study, teenagers have been found with less favourable outcomes both in terms of maternal and fetal outcomes.

STUDY LIMITATIONS

This study was retrospective and had a few limitations :

Being retrospective, some data was not available in the admission/delivery book which would have been useful to scrutinise. For example we would have been able to look at confounding factors like booking status, prenatal care, level of education and marital status to compare whether it had an effect on the outcomes or not. In a prospective study such information would have been more accurately determined from the case and by interviewing patients.

Some patients were excluded for the study because the ages were not indicated in the books. If it had been a prospective study, on interview, the ages may have been found out. Although their data is not presented, it did not appear as if these cases had anymore caesarean sections, instrumental deliveries or adverse outcomes.

Data was collated by inspection of various outcomes in the teenage and non-teenage age categories. If all variables had been entered on a spreadsheet, more detailed analysis could have been carried out including multivariate analysis.

Classifications like hypertension in pregnancy was not rigidly defined. It was noted if mentioned in the registers Accordingly this would have included all degrees of hypertension, at any stage of pregnancy.

Most of these limitations could be addressed in a prospective study.

CONCLUSION

This study has shown that teenage pregnancy and deliveries is common at the University Teaching Hospital. This probably reflects a generally high prevalence in the town as well as some of these patients are referred from all over the city of Lusaka and the peripheries. These teenagers have generally worse maternal and fetal outcomes - they have more instrumental deliveries, eclampsia and their babies are of low birthweight and more likely to be asphyxiated or stillborn.

Having said that it has been shown from the literature review that maternal age is not an isolated factor leading to poor obstetric outcome. Just as important is the quality of antenatal care the teenager receives (including health education), her nutritional status, living conditions and emotional support that she gets from the family and community.



RECOMENDATIONS

I therefore make the following recommendations:-

- (a) To follow up with a prospective study which will take into account possible confounding factors to obstetric outcomes like marital status, level of education , booking status and quality of prenatal care and nutritional status.
- (b) Improve on the quality and accessibility of antenatal care especially for the teenagers.
- (c) Make family planning services more readily accessible to teenagers in order to reduce the incidence of teenage pregnancy
- (d) Sex education to teenagers - the more they know about their sexuality, the less they will want to experiment subsequently.
- (e) Promptly dealing with obstetric problems when they occur to avoid catastrophies like obstetric fistulae, eclampsia and maternal death.

APPENDIX - TABLES AND FIGURES

Table 1 - Age distribution of all women delivering at UTH in 1996 (n=13065)

Age (years)	Number of patients	Percent
19 and below	2596	19.9
20-24	3912	29.9
25-29	2991	22.9
30-34	1805	13.8
35-39	1099	8.4
40 and above	285	2.2
Unknown	377	2.8
Total	13065	100

Table 2 Age Distribution of Teenagers delivering at UTH in 1996 (n=2596)

Age (years)	Number of patients	Percent
12	3	0.1
13	8	0.3
14	37	1.4
15	139	5.4
16	318	12.2
17	506	19.5
18	797	30.7
19	788	30.4
Total	2596	100

Table 3 - Age - gravity distribution in teenagers at UTH in 1996.

AGE	12	13	14	15	16	17	18	19	Total	Percent
GRAVIDITY										
G1	3	8	35	133	290	465	658	584	2172	83.7
G2	0	0	2	4	28	35	119	170	358	13.8
G3	0	0	0	2	0	4	17	30	53	2.04
G4	0	0	0	0	0	2	3	3	8	0.3
G5	0	0	0	0	0	0	0	1	1	0.03
TOTAL	3	8	37	139	318	506	797	788	2596	100

Table 4- Mode of Delivery of all women with known ages delivering at UTH in 1996 (n=12688).

Mode	Age (years)	Vacuum		Forceps		Spontaneous		Total	Percent
		Caesarean	%	extraction	%	Delivery	%	vaginal	%
16 and below	53	4	18	6.6	03	7.5	431	3.9	4
17-19	169	13	87	32	18	45	1817	16.4	16.5
20-34	885	68.1	158	58.1	17	42.5	7648	69.0	68.6
35-39	146	11.2	09	3.3	02	5	942	8.5	8.7
40 and above	46	3.5	-	-	-	-	239	2.2	2.2
TOTAL	1299	100	272	100	40	100	11077	100	100

Table 5 - Analysis of Mode of Delivery.

OUTCOME	TEENAGERS (n=2596)		NON-TEENAGERS (n=10092)		Odds Ratio (95%CI)	Chi Square uncorrected (Yates corrected)	P-Value uncorrected (Yates corrected)
	Number	Percent	Number	Percent			
Mode of delivery							
Caesarean Section	222	8.55	1077	10.7	0.78(0.67<OR<0.91)	10.10(9.87)	0.0014(0.0016)
Vacuum Extraction	105	4	167	1.6	2.46(1.90<OR<3.18)	53.13(52.03)	0.000000026
Forceps Delivery	21	0.8	19	0.18	4.32(2.23<OR<8.40)	25.3(23.37)	0.0000005
Combined - Operative and Instrumental Deliveries	348	1263	1263	12.5	1.08(0.95<OR<1.23)	1.48(1.40)	0.224(0.237)

Table 6 - Hypertensive Disorders by age groups.

Age (years)	Eclampsia	Percent	Hypertension in Pregnancy	Percent
16 and below	21	14.6	32	3.5
17-19	45	31.3	147	15.9
20-34	69	47.9	612	66.2
35-39	07	4.9	103	11.1
40 and above	02	1.4	30	3.2
Total	144	100	924	100

Table 7- Analysis of various maternal outcomes at UTH in 1996.

OUTCOME	TEENAGERS		NON-TEENAGERS		Odds Ratio (95%CI)	ChiSquare		P-Value	
	(n=2596)		(n=10092)			uncorrected	(Yates corrected)	uncorrected	(Yates corrected)
	Number	Percent	Number	Percent					
Hypertension	179	6.9	745	7.4	0.93(0.78<OR<1.10)	0.72(0.65)		0.394(0.418)	
Eclampsia	66	2.5	78	0.8	3.35(2.38<OR<4.72)	57.62(56.05)		0.0000000	
Maternal Death	17	0.6	88	0.8	0.75(0.43<OR<1.29)	1.19(0.94)		0.276(0.333)	
Ruptured Uterus	2	0.07	23	0.2	0.34(0.06<OR<1.47)	2.39(1.68)		0.1221(0.194)	

Table 8 - Incidence of stillbirths and severe birth asphyxia at UTH in 1996.

Age (years)	FSB	Percent	MSB	Percent	A/S	Percent
16 and below	16	5.5	23	4.9	27	6.7
17-19	38	13.1	100	21.5	117	21.2
20-34	199	68.6	300	64.5	349	63.2
35-39	28	9.6	35	7.5	35	6.3
40 and above	09	3.1	7	1.5	14	2.5
Total	290	100	465	100	552	100

FSB - Fresh stillbirths

MSB - Macerated stillbirths

A/S - Apgar score

Table 9 - Analysis of stillbirths and severe birth asphyxia.

OUTCOME	TEENAGERS (n=2596)		NON-TEENAGERS (n=10092)		Odds Ratio (95%CI)	Chi Square	P-Value
	Number	Percent	Number	Percent			
Apgar Score							
Fresh Stillbirth	54	2.0	236	2.3	0.89(0.65<OR<1.21)	0.62(0.5)	0.432(0.476)
Macerated Stillbirth	123	4.7	342	3.3	1.42(1.14<OR<1.76)	10.65(10.27)	0.00110(0.0013)
Severe Birth Asphyxia (A/S less than or equal to 5 at one minute)	154	5.9	398	3.9	1.54(1.26<OR<1.87)	19.62(19.15)	0.000009(0.000021)

Table 10 - Incidence of low birthweights at UTH in 1996.

Birthweight less than 1.5kgs			Birthweight between 1.5 and 2kgs	
Age (years)	< 1.5kgs	Percent	1.5-2.0 kgs	Percent
16 and below	39	6.0	45	6.0
17-19	154	23.6	163	21.8
20-34	422	64.7	488	65.2
35-39	16	4.0	43	5.7
40 and above	11	1.7	09	1.2
Total	652	100	748	100

Table 11 - Incidence of excessive birthweights at UTH in 1996.

Age(Years)	Number of patients	Percent
16 and below	-	-
17 - 19	7	4.1
20 -34	124	72.1
35 - 39	27	15.7
40 and above	14	8.1
Total	172	100

Table 12 - Analysis of birthweights.

OUTCOME	TEENAGERS (n=2596)		NON-TEENAGERS (n=10092)		Odds Ratio (95%CI)	ChiSquare (Yates correction)	P-Value (Yates correction)
	Number	Percent	Number	Percent			
Birth Weight							
Birth weight 1.5kg and below	193	7.4	459	4.5	1.69(1.41<OR<2.01)	35.29(34.70)	0.00000002(0.00000000)
Birth weight between 1.5 and 2kg	208	8.0	540	5.3	1.54(1.30<OR<1.83)	26.37(25.89)	0.00000003(0.00000004)
Birth weight more than 4kg	7	0.26	165	1.6	0.16(0.07<OR<<0.36)	28.78(27.77)	0.0000001(0.00000001)

Table 13 - Incidence of Ruptured Uterus at UTH in 1996.

Age (years)	Number	Percent
16 and below	01	4
17-19	01	4
20-34	20	80
35-39	02	8
40 and above	01	4
Total	25	100

Table 14 - Incidence of Maternal death at UTH in 1996.

Age (Years)	Number Of Cases	Percent
16 and below	04	3.8
17-19	13	12.4
20-34	73	69.5
35-39	12	11.4
40 and above	03	2.9
Total	105	100

Table 15 - Causes of deaths in the teenagers at UTH in 1996 (n=17).

Age	Cause of death (number of patients).
15	Eclampsia (1)
16	Malaria (2)
	Eclampsia (1)
17	Malaria (4)
	Guillan-Barre syndrome (1)
18	Malaria (2)
19	Malaria (2)
	Eclampsia (1)
	Postpartum haemorrhage (1)
	Chorioamnionitis (1)
	Peritonitis (1)

Table 16 - Analysis of various outcomes in teenagers up to the age of 16years.

Outcomes	Teenagers less than or equal to 16 (n=505)	Non-teenagers more than or equal to 17 (n=12183)	Odds Ratio (95% CI)	Chi square		P-value
				Uncorrected	(Yates corrected)	Uncorrected
Caesarean Section	53	1246	1.03(0.76-1.39)	0.04(0.01)		0.84(0.90)
Vacuum Extraction	18	254	1.74(1.03-2.88)	5.06(4.38)		0.02(0.03)
Forceps delivery	3	37	1.96(0.48-6.65)	1.30(0.54)		0.25(0.46)
Fresh stillbirths	16	274	1.42(0.82-2.42)	1.83(1.45)		0.17(0.22)
Macerated stillbirths	23	442	1.27(0.80-1.90)	1.18(0.93)		0.27(0.33)
Birthweights less than 1.5kgs	39	613	1.58(1.11-2.24)	7.20(6.66)		0.007(0.009)
Birthweights between 1.5 and 2kgs	45	460	1.60(1.15-2.21)	8.62(8.05)		0.003(0.004)
Eclampsia	21	123	4.25(2.58-6.96)	4.28(40.09)		0.000000
Maternal dearth	4	101	0.96(0.30-2.70)	0.01(0.03)		0.92(0.87)

Figure 1

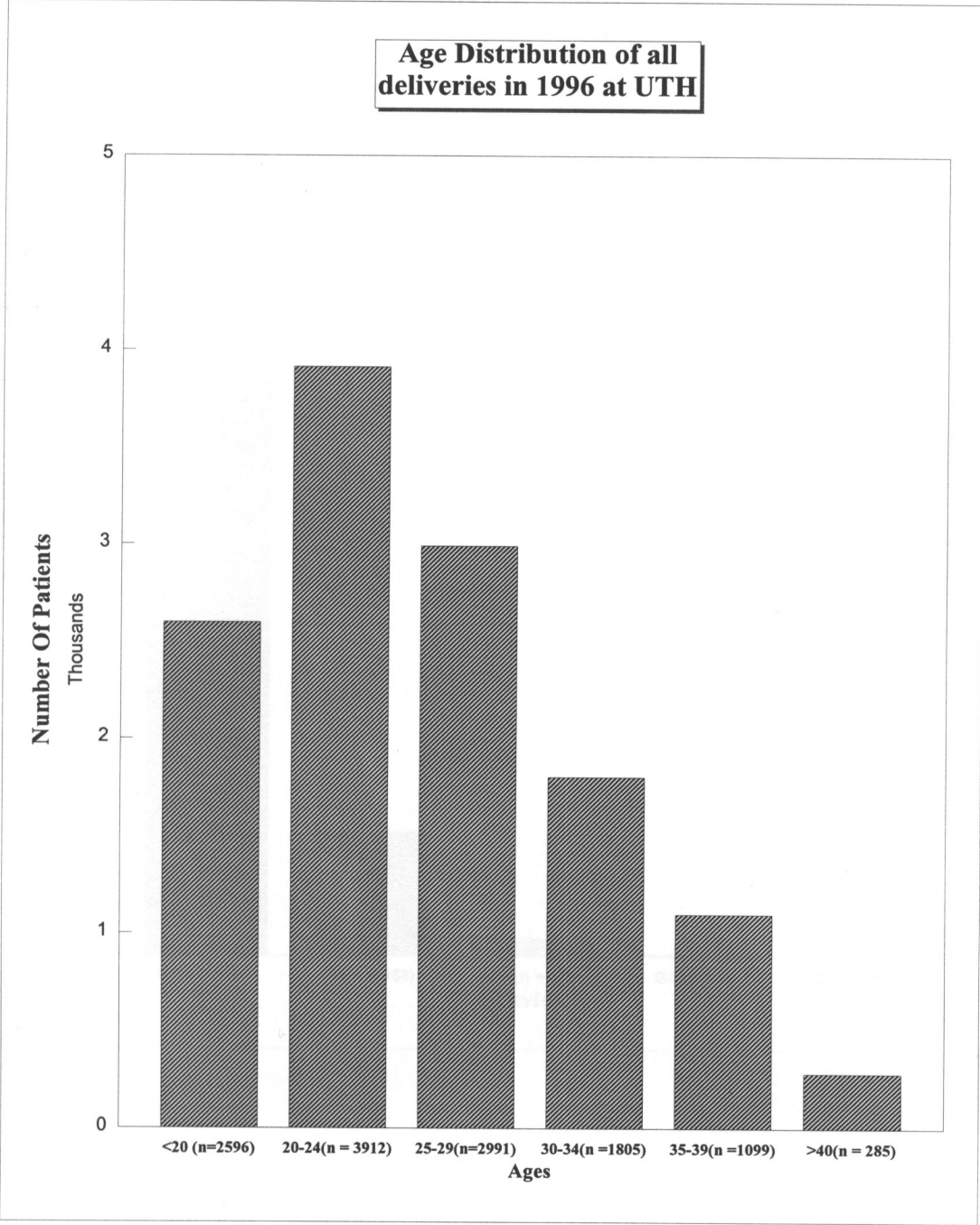


Figure 2

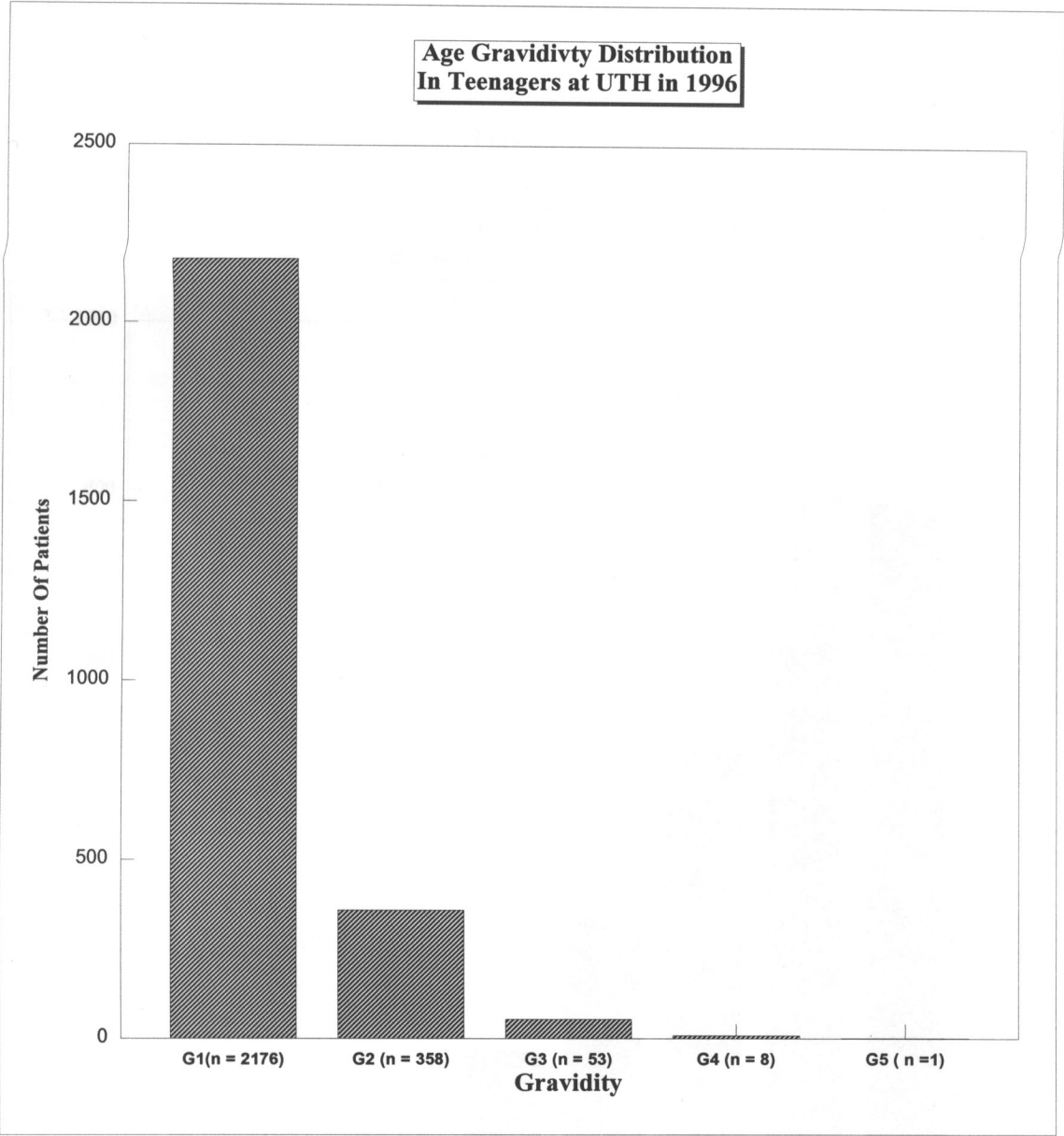
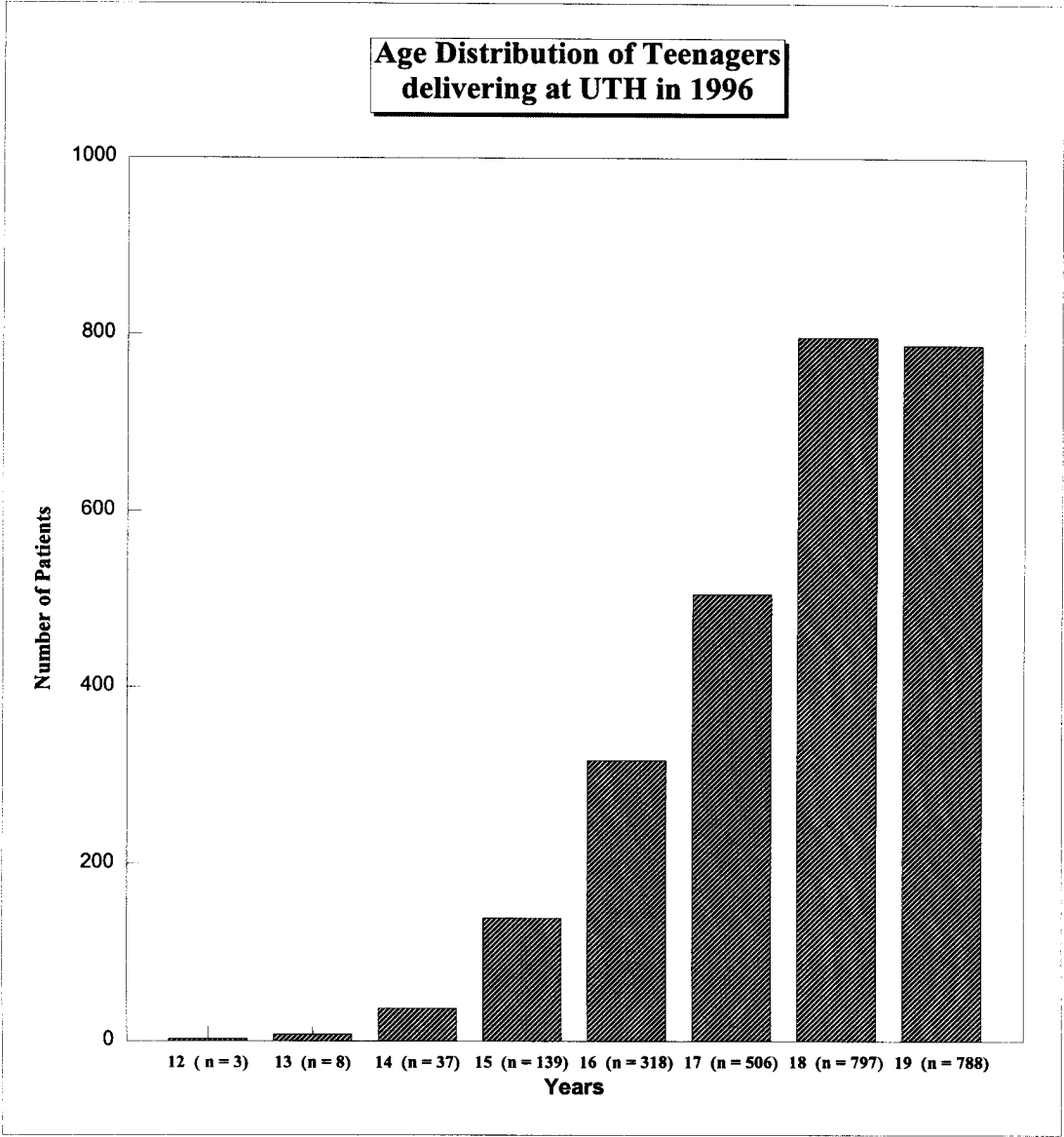


Figure 3



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