TO ESTABLISH THE CAUSES OF UNDER-FIVE MORTALITY AT KAMPALA INTERNATIONAL UNIVERSTIY TEACHING HOSPITAL

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BMS/0209/81/DF

A RESEARCH DISSERTATION SUBMITTED TO THE FACULTY OF CLINICAL MEDICINE AND DENTISTRY IN PARTIAL FULFILMENT FOR THE AWARD OF DEGREE IN BACHELOR OF MEDICINE AND SURGERY

November, 2013

DECLARATION AND APPROVAL

I, **BRIAN NYAMWAYA MOSE**, declare that this research is my own work and has never been presented to any other university or institution for the award of diploma, degree or any qualification whatsoever.

Where the work of other people has been included, acknowledgement to this has been made in accordance to the text and references quoted.

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SUPERVISOR'SAPPROVAL

I have read through the manuscript of this report. I am satisfied that it is fit for presentation for the award of a bachelor of Medicine and Bachelor of Surgery degree (MBChB).

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DEDICATION

I dedicate this research to my entire family, for without your individual contributions I would not have made it this far. May the God Almighty bless you abundantly.

ACKNOWLEDGEMENTS

I wish to express my sincere gratitude to my supervisor Dr Matilda Oketch for sparing her precious time to guide and advice me as I did the research. Special thanks to the records department Kampala International University-Western Campus for availing to me the materials I needed for the research. I also want to thank my family and colleagues who, in one way or the other, made this research a success.

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LIST OF ABBREVIATIONS

UN-United Nations

MDG-Millennium Developmental Goals

ITNs-Insecticide Treated Nets

UNICEF-United Nations Children's Fund

WHO-World Health Organization

LBW-Low Birth Weight

HIV-Human Immunodeficiency Virus

AIDS-Acquired Immune Deficiency Syndrome

ARI- Acute Respiratory Infection

KIU-TH-Kampala International University-Teaching Hospital

ABSTRACT

OBJECTIVE

To establish the causes of inpatient child mortality at Kampala International University Teaching Hospital.

METHODOLOGY

A retrospective data search was done in patient records of paediatrics between January 1st and June 30th 2013. The data was processed and analyzed by use of SPSS®.

RESULTS

There were a total of 142 patients. The most commonly diagnosed disease was malaria (33.1%) followed by surgical conditions (31.7%). 29 (20.4%) patients died. The commonest cause of death was prematurity and conditions related to it (11: 38%). Malaria and other infections accounted for 17.2% each. The most deaths occurred in the neonatal period.

CONCLUSION

Neonatal conditions accounted for the highest number of deaths followed by malaria. There is still more to be done to reduce under five deaths in order to reach the WHO target stated in MDG four.

RECOMMENDATION

Establishment of a neonatal intensive care unit (NICU) and hiring adequate and well trained staff to closely monitor the patients. To intensify the process of distributing free mosquito nets especially to pregnant mothers and education on prevention of malaria.

CHAPTER 1

1.1 INTRODUCTION

Child mortality rate is the highest in low-income countries, such as countries in Sub-Saharan Africa (UNICEF 2012). In 2011, 6.9 million children under five died (UN 2012), down from 7.6 million in 2010, 8.1 million in 2009, and 12.4 million in 1990 (UNICEF 2011). About half of child deaths occur in Sub-Saharan Africa. Reduction of child mortality is the fourth United Nation's Millennium Development Goals: the goal is to reduce under-five mortality by two-thirds between 1900 and 2015.

Of the estimated 130 million infants born each year worldwide, 4 million die in the first 28 days of life, three-quarters of this deaths occur in the first week, and more than one-quarter occur in the first 24 hours (Jehan, 2008). Neonatal deaths account for 40% of deaths under the age of 5 years worldwide and therefore, efforts to achieve the UN Millennium Development Goal (MDG) 4 of reducing childhood mortality by two-thirds by 2015 are focused on reducing neonatal deaths in high-mortality countries. (Jehan, 2008)

Six conditions account for about 70% of all child deaths: Acute lower respiratory infections, mostly pneumonia(19%), which is the leading cause of death in children worldwide, killing an estimated 1.2 million children under the age of five years every year – more than AIDS, malaria and tuberculosis combined (WHO, 2013). Diarrhoeal disease (18%) is the second largest cause of death in children under five years killing around 760,000 children worldwide every year (WHO 2013). Measles, (4%) is also a leading cause of under five mortality. In 2011, it killed 158,000 children under five globally, about 430 daily and 18 hourly (WHO 2013). Malaria accounts for 8% and HIV/AIDS for 3% (WHO, 2013). Neonatal conditions, mainly pre-term birth, birth asphyxia, and infections (37%) (WHO 2013).

The relative contribution of HIV/AIDS to the total mortality of children under-five, especially in sub-Saharan Africa, has also been increasing steadily. Malnutrition is a factor in more than half of the children who die after the first month of life (WHO 2011)

Despite many efforts being made in many countries to reduce the under five mortality, it still remains very high. Countries in Sub-Saharan Africa with weak and fragile health systems, which include most countries, have not been able to reduce under-five child deaths, and especially neonatal deaths (WHO 2011). For example, almost half a million deaths each year due to malaria under-five in Sub-Saharan Africa could have been prevented with the use of insecticide-treated bed nets, shown to reduce under-five mortality by up to 20% (WHO 2011). Of the 12 countries where more than 20% of children die before their fifth birthday, nine have suffered a major armed conflict in recent (WHO 2011). Poor families are often unable to obtain even the most basic health care for their children and hence poor or delayed care-seeking contributes to up to 70% of all under-five child deaths (WHO 2011).

Therefore there is still much to be done and some of the interventions that may improve the situation include: Scaling up effective health services like administering proven low-cost preventive care and treatment which can prevent up to 60% of under-five child deaths (WHO 2011). This includes continuous breast-feeding, vaccination, adequate nutrition and in Africa, the use of insecticide treated bed nets (WHO 2011). The major causes of under-five deaths need to be treated rapidly: for example, with salt solutions for diarrhoea or simple antibiotics for pneumonia and other infections (WHO 2011). To reach the majority of children who today do not have access to this care, there is need for better trained and equipped health workers. Families and communities need to know how best to bring up their children in a healthy way and deal with sickness when it occurs (WHO 2011). Political awareness, commitment and leadership are needed to ensure that child health receives the attention and resources needed to accelerate progress towards MDG4. Better information on the number and causes of under-five child deaths will help leaders to decide on the best course of action (WHO, 2011).

1.2 PROBLEM STATEMENT

Over 7 million children under-5 years of age die each year globally mainly from preventable and treatable conditions (Maternal and Child Health Uganda, 2008). About 19,000 children under the age of five, 13 each minute, die every day, mainly from preventable causes (UNICEF 2013). Pneumonia, diarrhoea and malaria remain the leading cause of child mortality, and under nutrition contribute to more than one-third of all deaths (Maternal and Child Health Uganda, 2008). Millions of children could be saved each year if proven interventions such as antibiotics for pneumonia, oral rehydration therapy for diarrhoea, and the provision of insecticide treated nets (ITNs) to prevent malaria, were universally available. While infant and under-5 mortality rates have declined from 186 deaths per 1000 in 1990 to 135 in 2008, Uganda is not on track to meet MDG 4 to reduce the under-5 mortality by two thirds between 1990 and 2015 and is ranked 19th country globally with the highest under-5 deaths (Maternal and Child Health Uganda, 2008).

Research and experience show that six million of the almost 11 million children who die each year could be saved by low-tech, evidence-based, cost-effective measures such as vaccines, antibiotics, micronutrient supplementation, insecticide-treated bed nets and improved family care and breastfeeding practices (UNICEF 2013). Significant progress has been achieved in tackling some major childhood diseases: Measles deaths have plummeted since 2000. Deaths from pneumonia, diarrhoea and malaria, have also reduced. Polio, though resistant thus far to elimination, has fallen to historically low levels. Routine immunization has increased almost everywhere (UNICEF 2013).

Progress in meeting Millennium Goal 4 is not on track. In 2011, four of ten regions were not on track to meet the Millenium Goal. This is particularly so in sub-Saharan Africa, where 1 in 9 children dies before the age of five, and Southern Asia, where that figure is 1 in 16. 144 countries are on track to meet the Goal but 51 countries lag far behind. There are still 24 countries where at least 1 in every 10 children dies before his or her fifth birthday, 23 of them in sub-Saharan Africa. This means that there remains much unfinished business as we approach the

2015 deadline – efforts must be intensified leading up to 2015 and the momentum sustained well beyond that (UNICEF 2013).

According to a UNICEF report 2012, Uganda was ranked 27 in the world with a rate of 99 in 2010. This was an improvement from rates of 193 in 1970, 175 in 1990 and 144 in 2000. This represented a 2.8% average annual rate of reduction between 1990 and 2010.
Uganda is estimated to have about 6.4 million under five children (UNICEF, 2012). This coupled to an annual population growth and total fertility rate of 6.1, it is therefore imperative that additional measures are put in place to reduce child mortality and secure the futures of these young children.

1.3 PURPOSE OF THE STUDY

Under-five deaths have been on a decline since the 90's. However, the current rate may not enable Uganda to achieve the Millennium Development Goal 4 which is to reduce the under-five mortality rate by two-thirds by 2015. In order to improve, progress and monitor the effects of public-health interventions, accurate, up-to-date estimates of national and sub national child mortality rates are essential. Many developing countries lack vital registration systems which are present in developed countries, and child mortality has to be estimated using data collected in surveys. This study therefore aims at contributing more information to already existing ones and filling the gaps that make it difficult to reduce the under-five mortality rate.

1.4 OBJECTIVES

1.4.1 GENERAL OBJECTIVE

To establish the causes of inpatient child mortality at Kampala International University Teaching Hospital.

1.4.2 SPECIFIC OBJECTIVES

- To find out the commonest diagnosed diseases in Paediatric inpatient ward
- To investigate the leading causes of child mortality at KIUTH
- To find out the commonest age group at which most children die at KIUTH

CHAPTER 2

2.1 LITERATURE REVIEW

More than 70 per cent of almost 11 million child deaths every year are attributable to six causes: diarrhoea, malaria, neonatal infection, pneumonia, preterm delivery, or lack of oxygen at birth. Most of these deaths occur in the developing world (UNICEF 2013). 7.6 million children under the age of 5 died in 2010 (CHERG 2012); of this, 64·0% (4·879 million) were attributed to infectious causes and 40·3% (3·072 million) occurred in neonates. Preterm birth complications (14·1%; 1·078 million), intrapartum-related complications (9·4%; 0·717 million), and sepsis or meningitis (5·2%; 0·393 million) were the leading causes of neonatal death. In older children, pneumonia (14·1%; 1·071 million), diarrhoea (9·9%; 0·751 million), and malaria (7·4%; 0·564 million) claimed the most lives (Li Liu, et al, 2010). For the first time, a neonatal cause of death ranked as high on the overall list, with preterm birth complications at second. According to CHERG, 2012, there has been a decline in death due to diarrhoea (CHERG 2012). According to the World Health Organization (WHO), poor neonatal conditions are the most prominent cause of young deaths. Four million babies per year die in the first week of life.

In South-central Asia -1 in 15 children die before age 5 (UN, 2011), while sub-Saharan Africa 1 in 8 children dies before age 5 (UN 2011). Two-thirds of deaths occur in just 10 countries. And the majority is preventable. Some of the deaths occur from illnesses like measles, malaria or tetanus. Others result indirectly from marginalization, conflict and HIV/AIDS. Malnutrition and the lack of safe water and sanitation contribute to half of all these children's deaths (UNICEF 2013)

In Bangladesh, serious infections were the most important cause of death among neonates (33 percent), followed by birth asphyxia (21 percent), prematurity/low birth weight (LBW) (11 percent) and acute respiratory infection (ARI) (10 percent). Among the neonates, 135 (39 percent) of the deaths were associated with prematurity/LBW and of these, the direct causes of death were: neonatal tetanus (4), congenital abnormality (7), birth Asphyxia (16), birth injury (5), diarrhea (2), ARI (15), possible serious infection (46), and prematurity/LBW (42) (El Arifeen et al, 2009). Among infants aged 29 days-11 months, ARI was associated with almost half of the deaths. A quarter of the post-neonatal deaths were due to possible serious infections,

and diarrhea contributed 15 percent of deaths in this age group (El Arifeen et al, 2009). Among older children (12-59 months), possible serious infection was the most important killer (37 percent), followed by injuries (22 percent) ─ particularly drowning (19 percent) ─ ARI (17 percent), malnutrition (11 percent) and diarrhea (9 percent) (El Arifeen et al, 2009). Overall among all under-five children (131 cases), possible serious infections (31 percent) and ARI (21 percent) were responsible for most of the deaths. This was followed by birth asphyxia (12 percent), diarrhea (7 percent) and prematurity/LBW (7 percent). Malnutrition was associated with 131 (22 percent) of all under five deaths. Of these 131 cases, the direct causes of death are: injuries (2), measles with ARI diarrhea (1), diarrhea (16), ARI (47), ARI and diarrhea (5), Possible serious infection (39), and malnutrition alone (21). Overall, a cause could not be assigned to 31 (6 percent) of the under-five deaths (El Arifeen et al, 2009).

In Iraq, illness was the leading cause of death in children under-five years of age (81.2%). The highest percentage (90.3%) was among infants 1–11 months of age, and 77.0% of neonatal deaths and 76.5% of deaths among children between 1–4 years. (Awqati, 2009. In the neonatal period difficult breathing was the leading symptom preceding the death event (42.3%), in the infancy period, diarrhea was the leading cause of death as reported by the mothers (49.8%), followed by the symptoms of cough and/or difficult breathing (26.6%), then vomiting and fever (5.0% and 5.1%, respectively). In the 12–59 months age group, diarrhea was the leading cause of death (43.4%), followed by cough/difficult breathing (14.8%), then fever (5.9%) (Awqati, 2009). Sudden death was the second cause of deaths (8.9%), being most prevalent during the first few months of life. The highest percentage was found in the neonatal period (11.9%), with only 5.8% during the infancy period. Males were affected by sudden death more than females 9.3% versus 8.4% (Awqati, et al, 2009).

According to Caulfield, 2003, a total of 1,544 deaths were analysed, 87 (6%), 225 (14%), 317 (21%) and 915 (59%) of which occurred in the periods < 1 month, 1–5 months, 6–11 months and 1–4 years respectively. Malaria was the most frequent diagnosis (42%) with peak mortality rates in infants aged 6–11 month.

More children died (3.6 million) in Sub-Saharan Africa than any other region in the world, and the rate of improvement was slower there than the global average (CHERG 2012). . Infectious disease caused nearly three-quarters of all child deaths compared to 64 percent globally. Nearly all of the malaria and AIDS deaths occurred in the region (96 percent and 90 percent, respectively) (CHERG 2012). Undernutrition is an underlying cause in more than a third of under-five deaths. Half of Africa's newborn deaths occur in just five countries – Nigeria, Democratic Republic of the Congo, Ethiopia, Tanzania and Uganda. Nigeria alone has over 255,000 newborn deaths each year (WHO, 2006). An Ethiopian child is 30 times more likely to die by his or her fifth birthday than a child in Western Europe (UNICEF 2013). Malaria is still a major killer in Sub-Saharan Africa, causing about 16 percent of under-five deaths. Sub-Saharan Africa has the highest risk of death in the first month of life and has shown the least progress. (UN, 2011). Half of Africa's newborn deaths occur in just five countries – Nigeria, Democratic Republic of the Congo, Ethiopia, Tanzania and Uganda. Nigeria alone has over 255,000 newborn deaths each year (WHO, 2006)

In Guinea the under-5 mortality was 171/1,000, the infant mortality 97/1,000, the post-neonatal mortality 47/1,000, and the neonatal mortality 50/1,000. The five most common causes of under-5 deaths were malaria (32%), acute respiratory infections (25%), diarrhea (15%), neonatal tetanus (9%), and birth asphyxia (7%). Other causes of death were malnutrition (6%), neonatal infections (4%), meningitis/sepsis (4%), and measles (2%) (Schumacher, et al, 2002).
Early neonatal mortality was about one-half of neonatal mortality, neonatal mortality about one-half of infant mortality, and infant mortality accounted for one-half of the total under-5 mortality (Schumacher, et al, 2002).

In Uganda, Rwanda, and Ghana, maternal factors and complications during pregnancy, labour, and delivery were the largest cause of neonatal deaths (deaths between 0 and 28 days of life; 20%, 42%, and 70%, respectively) while sepsis was the highest cause in Mozambique (35%) (Parcesepe et al, 2013). In all the three countries except Rwanda, malaria was the number one cause of childhood deaths (deaths between 29 days and 59 months), ranging from 42% to as high as 51% of all childhood deaths. In Rwanda, malaria was the third largest contributor to childhood

deaths (15%), after pneumonia (19%) and diarrhoea (18%). Other major causes of childhood deaths were diarrhoea, pneumonia, and malnutrition. (Parcesepe, et al, 2013)

CHAPTER THREE

3.1 STUDY AREA

The study was carried out at Kampala international University Teaching Hospital. It was opened in 2007, with a mission to positively contribute to the mandate of government "of ensuring the provision of quality equitable and accessible preventive and curative health services to the people of Uganda by providing quality medical care to patients and training health workers". The hospital is located in Ishaka – Bushenyi municipality, Bushenyi District in western Uganda. It is 300 kilometers away from Kampala city center along Mbarara-Kasese highway. The hospital comprise both private and public wing. And has the following units: outpatient, wards (pediatric, surgical, obstetrics and gynecology, medicine) accident and emergency, theatre, laboratory, x-ray, scan units. It also runs special clinics for example dental, ear, nose and throat clinics, ophthalmology clinics, antenatal, and orthopedic clinics. The hospital serves a population of approximately 125,000 people.

3.2 STUDY DESIGN

This study was a retrospective record search. Data was collected from the paediatrics ward records of patients.

3.3 STUDY POPULATION

The study included all children under the age of five who were admitted at KIU-TH between 1st January 2013 to 1st June 2013.

3.4 DATA ANALYSIS

The data was processed and analyzed by use of computer software SPSS®.

3.5 ETHICAL CONSIDERATION

Permission to access the records was sought from the Dean, Faculty of Medicine and Dentistry.

3.6 STUDY LIMITATION

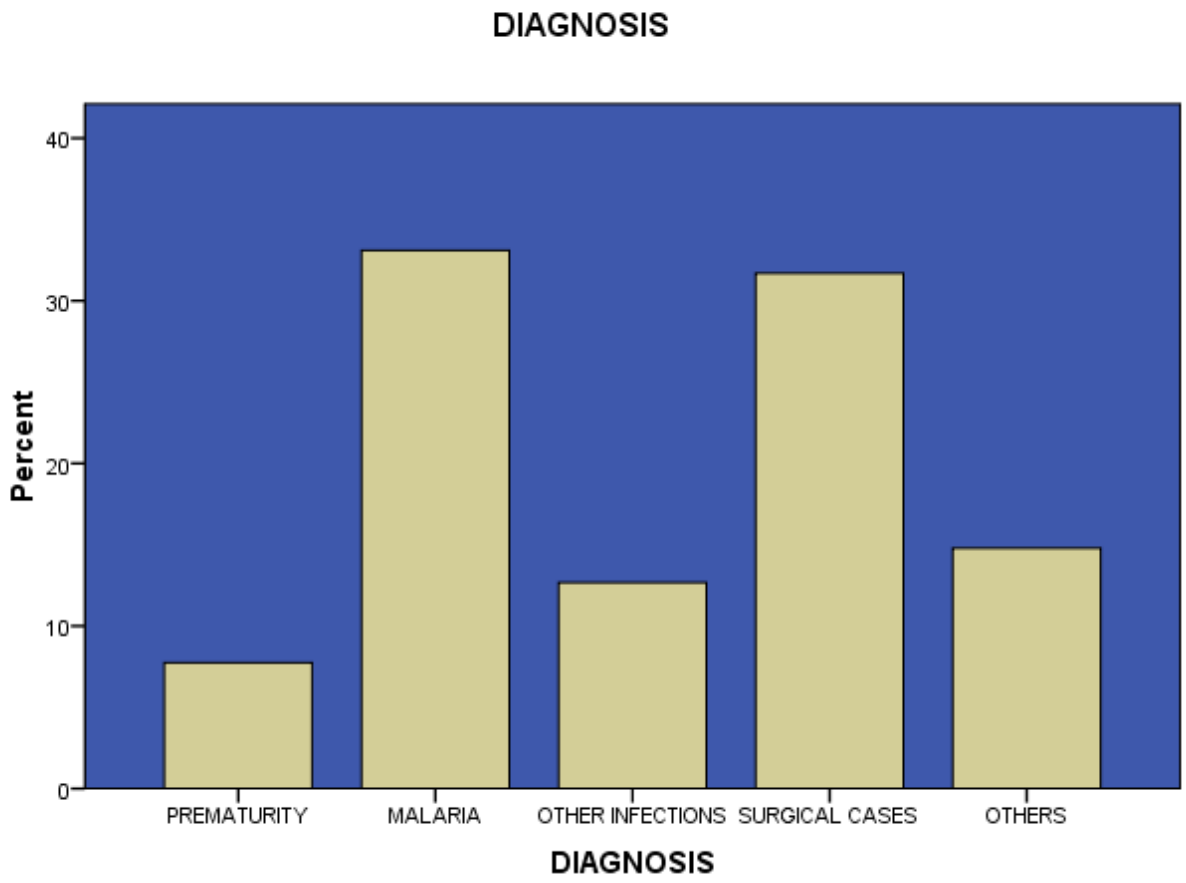
The limitations of this study were balancing between performing it and my academics and several errors in the patient files.

CHAPTER FOUR

RESULTS

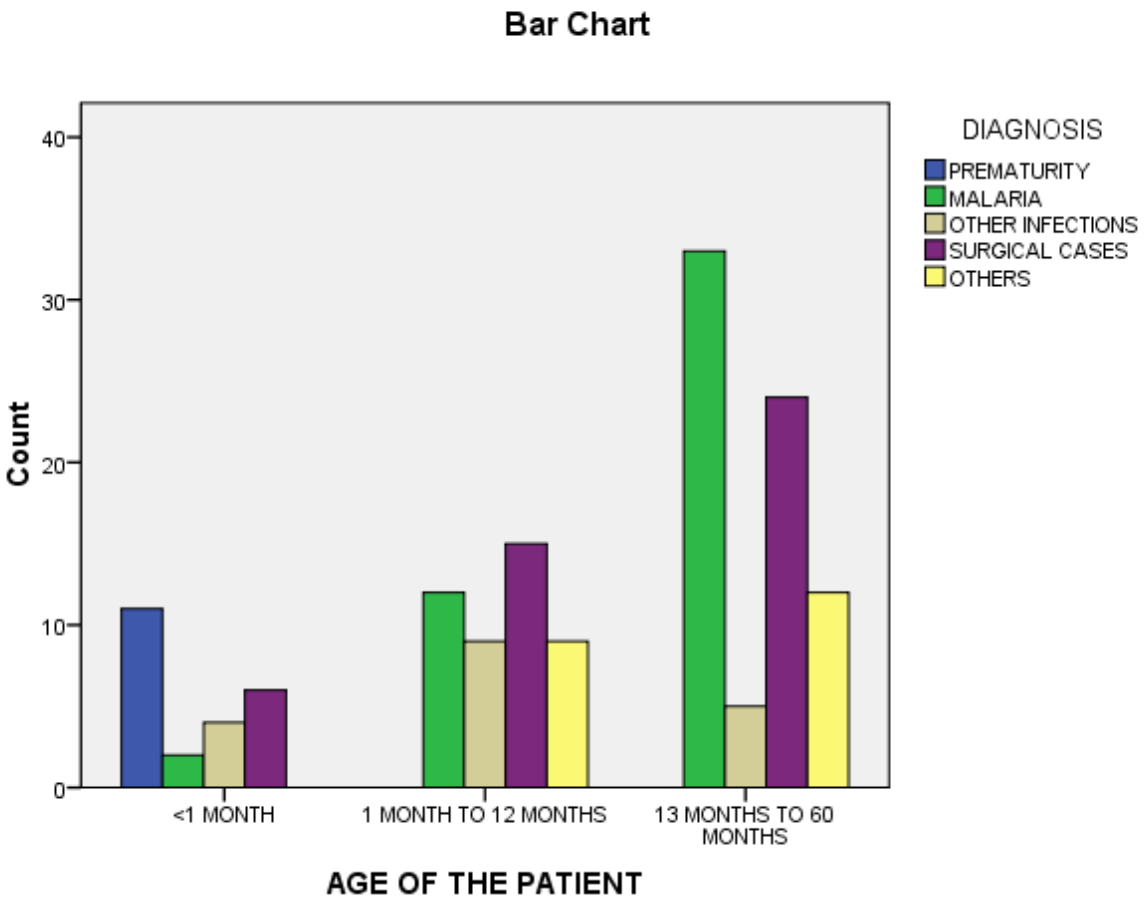
The results generated from the SPSS software are presented in figures and charts in this chapter.

FIGURE 1: Showing the commonly diagnosed diseases



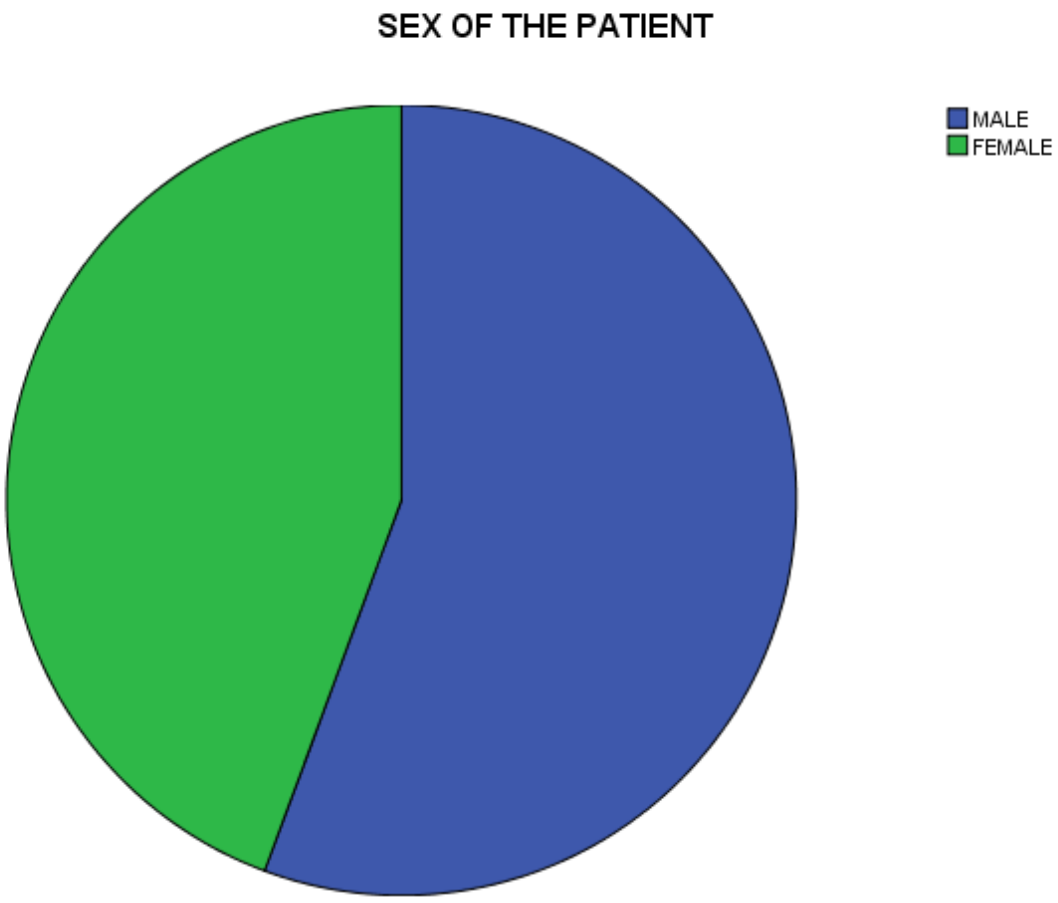
Malaria was the commonest diagnosed disease, accounting for 33.1% of the total followed by surgical cases (31.7%).

FIGURE 2: Showing diseases by age



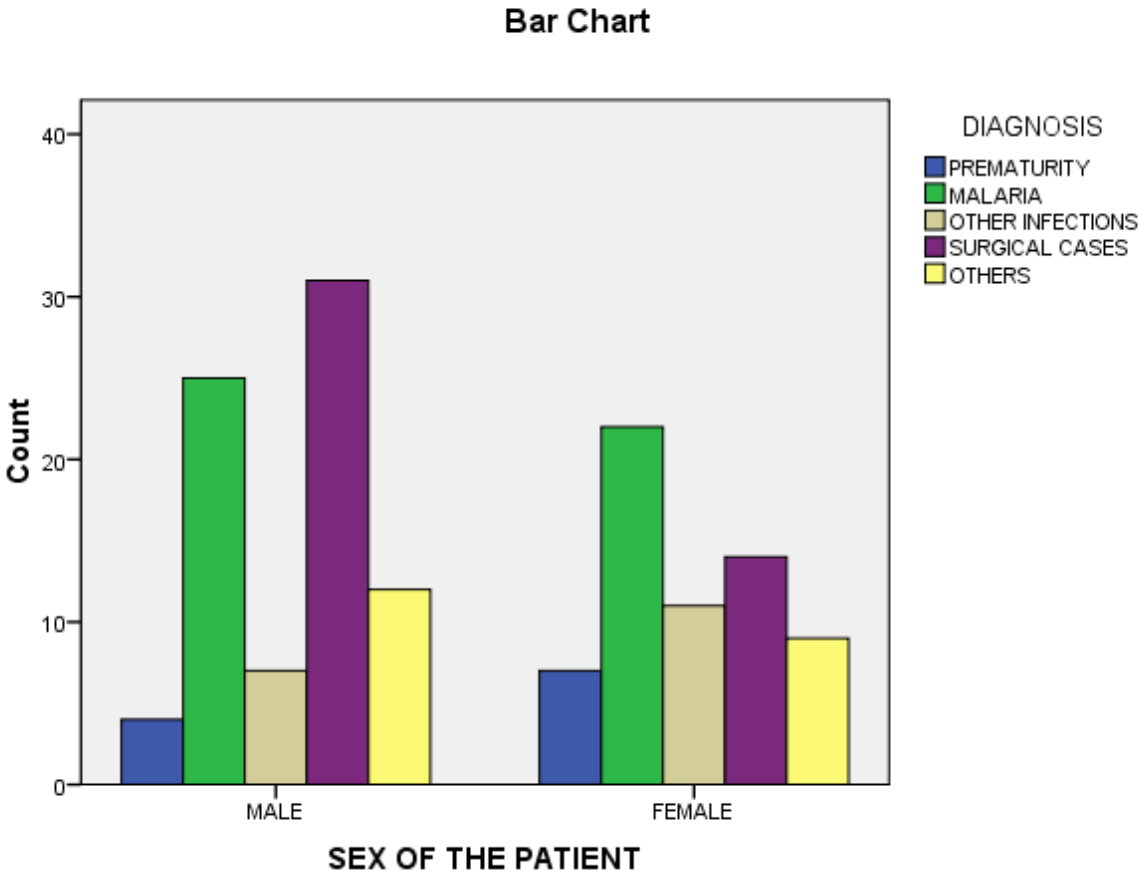
Prematurity related conditions were the commonest diseases in neonates (<1 month) while malaria was the commonest disesase in children aged between 1 and 5 years.

FIGURE 3: Showing ratio of males to females



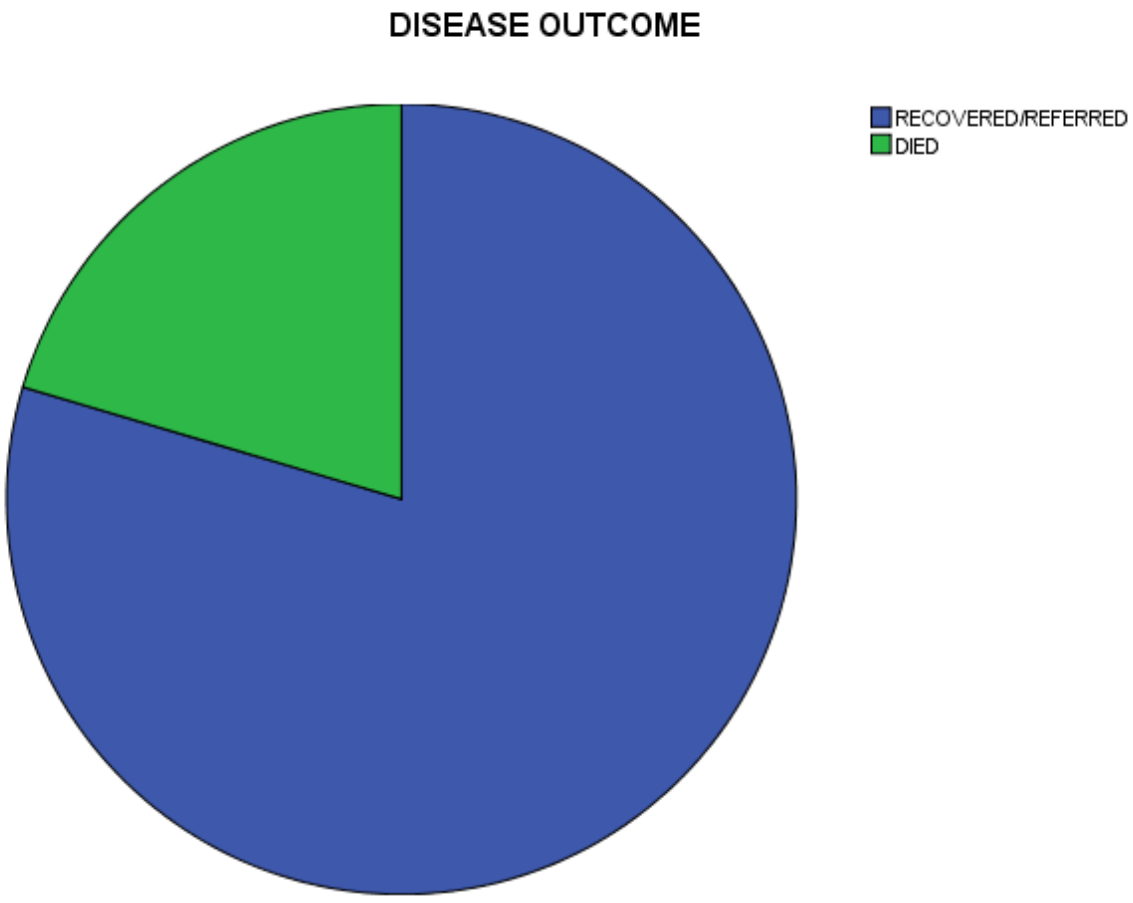
Male children were more affected (55.6%) than the females (44.4%).

FIGURE 4: Showing diseases by sex



Surgical cases were diagnosed mainly in the males while malaria was the most common in females.

FIGURE 5: Showing outcome of the diseases



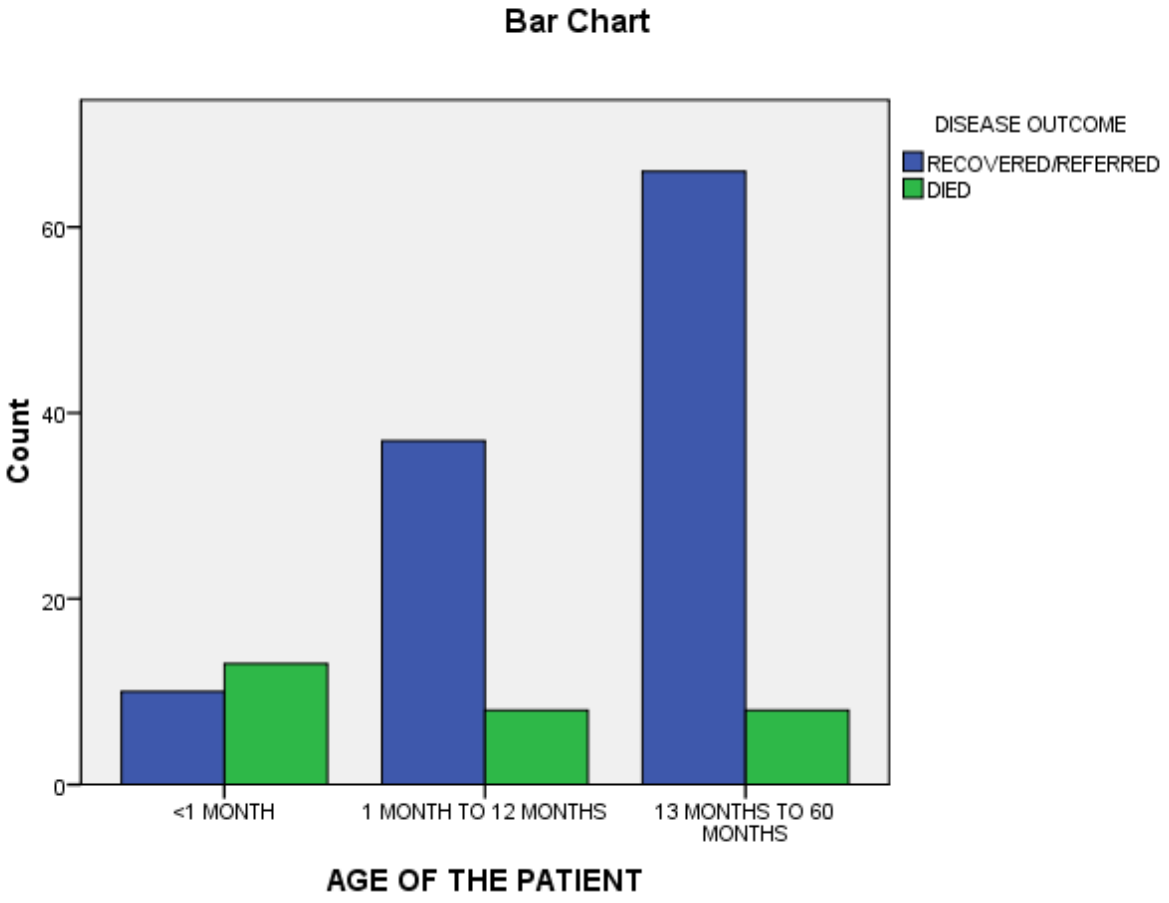
Out of all the admissions, 79.6% either recovered or were referred to another hospital while 20.4% died.

TABLE 1: Showing the number of deaths and their causes

		DISEASE OUTCOME		**TOTAL**
		RECOVERED/REFERRED	**DIED**	
DIAGNOSIS	PREMATURITY	0	11	11
	MALARIA	42	5	47
	OTHER INFECTIONS	13	5	18
	SURGICAL CASES	44	1	45
	OTHERS	14	7	21
TOTAL		113	29	142

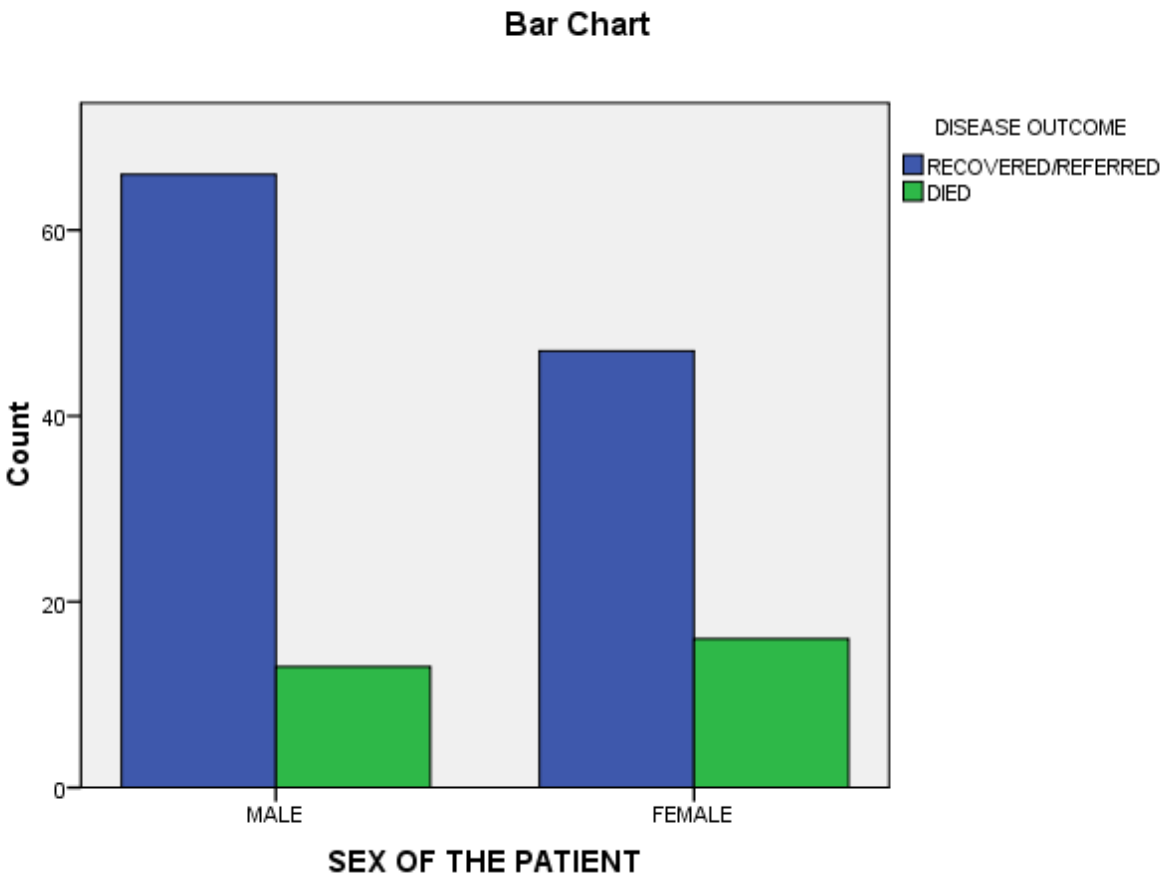
Prematurity related cases accounted for the most deaths, 11, followed by other causes and malaria and other infections tie at 5 each.

FIGURE 6: Showing outcome of disease by age



More children died in the neonatal periods than any other with the most recovering between the ages of 1 and 5.

FIGURE 7: Showing the disease outcome by sex



More males recovered/referred while more females died.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 DISCUSSION

5.1.1 INTRODUCTION

This study was conducted to determine the causes of inpatient under five mortality, the commonest diagnoses, the outcome of disease by gender and age at Kampala International University Teaching Hospital.

The study population was all the paediatric patients admitted at Kampala International University Teaching Hospital between January 1st 2013 to June 30th 2013. They were 142 in number.

5.1.2 THE COMMONEST DIAGNOSED DISEASES

There were a total 142 patients in the period of 6 months starting January 1st 2013. The commonest disease diagnosed was malaria accounting for 47 cases and giving a percentage of 33.1%. Surgical cases which included circumcision, phimosis, hypospadias, head injuries, spina bifida, intestinal obstruction and thyroglossal cyst among others accounted for 45 of the cases representing 31.7%. Others which included cases such as organophosphate poisoning, hypoglycaemia, and dog bites were 21 (14.8%). Other infections were pneumonia, meningitis, typhoid fever and sepsis were18 (12.7%). Prematurity related conditions such as respiratory distress and birth asphyxia accounted for 11 cases (7.7%).

5.1.3 DIAGNOSIS BY AGE

The ages were subdivided into three groups, <1 month (neonates), 1 month to 12 months, and 13 months to 60 months. In the first group, there were 23 diseases mostly resulting from prematurity and this represented a 16.2%. Between 1 and 12 months there were 45 cases (31.7%) mostly resulting from surgical cases. In the third group there were 74 cases (52.1%) mostly resulting from malaria.

5.1.4 DIAGNOSIS BY SEX

In male patients, surgical cases were the commonest (31) followed by malaria (25) while for females it was the reverse, malaria (22) and surgical cases (14).

5.1.5 DISEASE OUTCOME

Out of the 142 cases, 113 recovered or were referred and 29 died. The most deaths occurred in the premature category (11; 38%), followed by the others category (7, 24.1%), and malaria and other infections (5 each; 17.2% each)**,** and lastly surgical cases (1; 3.4%). More females than males died. The females accounted for 55.2 % (16) of the 29 deaths while males accounted for 44.8% (13). According to the ages, the neonates accounted for the most deaths (13; 44.8%), and the other two categories tied at 8 cases each; 27.6%). This is in line with existing data that states that malaria accounts for 8% (WHO, 2013), neonatal conditions 37% (WHO, 2013) of all under five deaths worldwide.

5.2 CONCLUSION

In conclusion, neonatal conditions for example prematurity accounted for the highest number of deaths, followed by malaria and other infections such as pneumonia.

There is therefore much more to be done to reduce these deaths even further and hopefully reach the target set by the WHO in the MDG goal 4.

5.3 RECOMMENDATIONS

Establishment of a neonatal intensive care unit (NICU) with proper facilities such as incubators and neonate size resuscitation equipment to support the lives of the premature babies until their organs are well developed to function independently and tolerate the environment. Hiring of adequate sufficiently trained staff to man the NICU all through for close monitoring of the babies.

To intensify, with help from the Ministry of Health (MoH), the process of giving free insecticide treated mosquito nets to pregnant mothers and educating others on the importance of acquiring them; this coupled to education on ways for preventing malaria like cutting bushes around the house and draining stagnant water.

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APPENDIX 1:

DEFINITIONS:

Under-five mortality: the probability of dying between birth and the fifth birthday.

Neonatal mortality: the probability of dying within the first month of life.

Post neonatal mortality: the arithmetic difference between infant and neonatal mortality.

Infant mortality: the probability of dying between birth and the first birthday.

Child mortality: the probability of dying between exact age one and the fifth birthday.