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Drug utilisation in the maternity ward of a district hospital in South Africa

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RESEARCH REPORT

Drug Utilisation in the Maternity Ward of a District Hospital in South Africa

Kebinakwena Beauty Pitso
2/1/2012

Research report submitted to the Faculty of Health Sciences, University of the Witswatersrand, in partial fulfilment of the requirements for the degree of Master of Public Health in the field of Hospital Management

DECLARATION

I, Kebinakwena Beauty Pitso, declare that this research report is my own work. It is being submitted for the degree of Master Public Health in the field of Hospital Management at the University of the Witwatersrand, Johannesburg. It has not been submitted before any degree or for any examination at this or any other University.

……

JOHANNESBURG

DEDICATION

This study is dedicated to

Both my parents Mothootsile Jonas Sekobe and Dorothy Thato Sekobe

Who jointly taught us (their children) that

Perseverance is the mother of success.

ACKNOWLEDGEMENTS

To God Almighty I give thanks, praise and glory for countless blessings, of which amongst them is the privilege of good health as well as academic development.

I would like to take this opportunity to express my sincere gratitude and appreciation to the following people who sacrificed to assist and support me by providing records, collecting and capturing data from Pretoria West Hospital:

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- Edith Moyo and her team, Admissions and Records Department

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GLOSSARY OF TERMS

Drugs: In pharmacology, a drug is "a chemical substance used in the treatment, cure, prevention, or diagnosis of disease or used to otherwise enhance physical or mental well-being (Rubin, 1995).

Teratogen: Teratogen is a drug or other substance capable of interfering with the development of a fetus, causing birth defects (Rubin, 1995).

LIST OF ABBREVIATIONS

CS	Caesarean section
END	Early neonatal death
FSB	Fresh still birth
GDoHSD	Gauteng Department of Health and Social Development
HIV	Human Deficiency Virus
INJ	Injection
NHRPL	National Health Reference Price List
MSB	Macerated still birth
PIH	Pregnancy Induced Hypertension
PPH	Post Partum Haemorrhage
UPFS	Uniform Patient Fee Schedule
VBAC	Vaginal Birth After Caesarean section

EXECUTIVE SUMMARY

ABSTRACT

Background:

Use of drugs in maternity unit plays a major role in maternal health service delivery. Therefore, drug use during pregnancy requires close monitoring which includes prescription of appropriate medication to their diagnosis, correct doses, and adequate period of time. Drugs are also one of the major cost drivers in health facilities. Although maternal health services are receiving increasing attention in South Africa, very few systematic studies have been done to analyze this important component (prescribing patterns and costs of drugs) of maternal health care services in a district hospital setting.

Aims:

The overall aim of the study is to assess the drugs utilized in a maternity ward at Pretoria West District Hospital (A district hospital in the Tshwane District in the Gauteng Province) and the factors that might influence its use and their cost over a period of one year.

Methodology:

Cross-section study design was used. Retrospective review of hospital records was undertaken for 2087 maternal patient deliveries during one year study period (01 January to December 2009) and no primary data was collected. Data was extracted for variables used in the study (quantity and cost of drug used, profile of patients). The study commenced after obtaining necessary approval from the Gauteng Department of Health and Social Development and University of the

Witwatersrand “Human Research Ethics Committee (Medical)’.

Results:

The study found that all the patients were prescribed iron supplements. The second most commonly prescribed drugs are uterotonics. Besides these two items other prescription drugs were prescribed to 7% of patients. Postnatal contraceptives were seldom used. The most commonly used antibiotic was Ceftriaxone. Bezylpenicillin was prescribed only for one RPR positive patient during one month. Only 13% HIV positive received antiretrovirals which is too low as compared to number of mothers delivered. The study found under-prescription of anti-hypertensive drugs. Low use of parenteral analgesics signifies that probably patients were not given adequate pain relief during labour and this policy should be reviewed. The quantity of biological vaccines (BCG and oral polio) was prescribed routinely for all the newborn babies. However, the antiretrovirals (Zidovudine and Nevirapine syrups) were prescribed for fewer newborn babies (n= 51), in comparison to total number of babies born to a HIV positive mothers (n=266) and of concern. Total cost for the drugs used during one year study period was R 113,664.56. The average costs per mother and newborn babies were R 39.40 and R 15.08 respectively. Routine availability of affordable and effective drugs is one of the key indicators of quality health. The study showed that affordable and effective drugs were readily available in the Unit.

Conclusion:

This is probably the first study that documented the use of drugs in the maternity unit in a district hospital. Further prospective study would be able to provide more information in this important subject

CHAPTER 1

INTRODUCTION

The purpose of this study was to assess the drugs utilized in the Maternity Unit of a district Hospital in the Gauteng Province, the factors that might influence their uses and their costs. Due to the limitation of data on prescribing patterns and drug utilisation in maternity units, the study, although its focus will retain the stated aim, this will be undertaken with the limitation of lack of access or availability of robust data. The introductory chapter will cover the background to the study, statement of the problem, its aims and objectives and an outline of subsequent chapters.

1.1 BACKGROUND

Drug treatment in pregnancy presents a special challenge due to the threat of potential teratogenic effects of the drugs and maternal physiological adjustments during the pregnancy (Banhidy, Lowry, Czeizel, 2005). The physiology of pregnancy may affect the metabolism of drugs. Some drugs can reach the fetus and may cause harm in-utero (Deborah, McCarter, Spaulding, 2005). However, total avoidance of drug use in pregnancy is not possible as some women have had medical conditions (such as asthma, diabetes, epilepsy, and hypertension) and some develop these conditions during pregnancy and postpartum period (Sachdeva, Patel, Patel, 2009). These conditions require ongoing and *episodic* treatment. However, certain drugs given during pregnancy may prove harmful to the unborn child. Use of drugs during pregnancy and lactation has been associated with some crisis in the past (such as thalidomide crisis in the 1960's and the diethylstilboestrol in 1971) (Melton, 1999).

Thalidomide is a sedative drug introduced in 1950 for treating various conditions which includes insomnia, coughs, colds, headaches and morning sickness. Thousands of pregnant women took it to relieve their symptoms (http://en.wikipedia.org/wiki/Thalomid).

Late 1950's and early 1960's more than 10 000 children from 46 countries were born with deformities as a result of Thalidomide. Worldwide estimates ranges between 10 000 and 20 000. It was withdrawn in 1961 after discovering that it causes birth defects (http://en.wikipedia.org/wiki/Thalomid). Diethylstilbestrol is a synthetic synthetic nonsteroidal estrogen first synthetized in 1938 (http://en.wikipedia.org/wiki/Diethylstilbestrol).

It was given to pregnant women from 1940 – 1970 to reduce the risk of pregnancy complications and losses which was found to be a false belief. In 1960 it was mentioned in six of the seven obstetrics books that it was ineffective in preventing miscarriage (http://en.wikipedia.org/wiki/Diethylstilbestrol).

In 1971 it was reported in New England Journal of Medicine that there is a probable link between Diethylstilboestrol and vaginal clear cell adenocarcinoma in girls and young women who had been exposed to this drug in utero (http://en.wikipedia.org/wiki/Diethylstilbestrol).Later in the year the FDA Drug Bulletin was sent to U.S. physicians advising against the use of Diethylstilbestrol in pregnant women (http://en.wikipedia.org/wiki/Diethylstilbestrol).

Women who had Diethylstilbestrol prescribed during pregnancy have shown to have a modestly increased risk of breast cancer mortality. Girls exposed to Diethylstilbestrol are at an increased risk of abnormalities of the reproductive tract, including vaginal epithelial changes, an increased cervical transformation zone and uterine abnormalities such as T shaped uterus (http://en.wikipedia.org/wiki/Diethylstilbestrol).

The boys exposed to Diethylstilbestrol increased risk of testicular cancer, infertility and urogenital abnormalities in development, e.g. cryptorchidism and hypospadias (http://en.wikipedia.org/wiki/Diethylstilbestrol).

The events led the governments in different countries to establish regulatory bodies (such Food and Drug Administration in the USA, Medicine Control Council in South Africa). The Food and Drug Administration and Medicine Control Council establish regulations regarding drug labelling and the use of medication, which includes the pregnancy period (Ward, 2001).

1.2 JUSTIFICATION OF THE STUDY

Drug supply is one of the important determinants of utilization of health services (Baltussen, Ye, Haddad, et al, 2002). Use of drugs in maternity unit plays a major role in maternal health service delivery. Therefore, drug use during pregnancy requires close monitoring which includes prescription of appropriate medication to their diagnosis, correct doses over adequate period of time (Moore, Bykov, Savelli, et al, 1997). Drugs are also one of the major cost drivers in health facilities (Moore, et al, 1997; Attridge and Preker, 2005).

With maternal health services receiving increasing attention in South Africa, there is still limited systematic studies have been conducted to analyze this important component (prescribing patterns and costs of drugs) of maternal health care services in a hospital setting. The study was planned in this setting in a district hospital. The researcher hopes that this study will assist in determining the prescribing pattern and costing the actual expenditure on drugs in the maternity ward of district hospitals in South Africa.

1.3 RESEARCH QUESTION

How are the drugs utilized in a maternity ward at the Pretoria West District Hospital over a period of one year? What are the factors that might influence its use and the costs involved?

1.4 STUDY OBJECTIVES

1.4.1 BROAD OBJECTIVE

The overall aim of the study was to assess the drugs utilized in the Maternity Unit at the Pretoria West District Hospital, the factors that might influence its use and their cost over a period of one year (01 January 2009 to 31 December 2009).

1.4.2 SPECIFIC OBJECTIVES

1. To describe the drugs used in a maternity ward at the Pretoria West District Hospital, over one year period (01 January 2009 to 31 December 2009).
2. To determine the factors that might influence its use (a) Number of patients delivered during this period (b) Patient profile (socio-demographic and obstetrics)
3. To determine the costs of the drugs used in the maternity ward during this period.

1.5 SUBSEQUENT CHAPTERS

So far, the background to the research has been discussed. Then, research question and objectives were defined in this first chapter. Brief outline of following chapters are described below.

Chapter Two Literature Review:

The purpose of the literature review is to review pertinent literature and to discuss concepts related to the maternity services with particular reference to utilization of drugs in maternity units of district hospitals in South Africa and elsewhere.

Chapter Three Research Methodology:

The chapter describes the research methodology, study design, setting and scope and data management techniques used in this study.

Chapter Four: Presentation of Results:

This chapter deals with an analysis of the data collected for this study relating to its aims and objectives.

Chapter Five: Discussion:

The findings from the review of the literature are incorporated in this chapter with the results obtained from the analysis in order to address the aims and objectives of the study.

Chapter Six: Conclusions and Recommendations:

This constitutes the last chapter of the report and derives conclusions from the research related to the objectives of this study, makes recommendations and advocates areas for future research in the field of utilization of drugs in maternity units in a district hospital setting.

CHAPTER 2

LITERATURE REVIEW

In this chapter, relevant reports into drug utilization with particular reference to drug used for maternity patients are discussed. In addition to published literature, information from various unpublished sources is also reviewed.

2.1 DRUG USE IN PREGNANCY

Drug use in pregnancy present an interesting dilemma. On one hand, the use of drug is frequently life saving for mothers and babies and often unavoidable (Sachdeva, et al., 2009). On the other hand, it may cause not only congenital malformations, but also intellectual, social and functional development of babies. Venter (2003) listed the key points related to drug use in pregnancy (Table 2.1).

Table 2.1 Key points related to drug use in pregnancy

1	Drug therapy in pregnancy can adversely affect both mother and fetus
2	All drugs should be considered harmful until proven safe as any therapeutic substances could pass from mother to fetus
3	Adverse effects of drugs are dose and time related
4	Despite risk of drug use in pregnancy, their uses in certain clinical conditions are unavoidable.
5	The use of drugs would require evidence based decision on benefits and risks of such treatment. The patients should be consulted in such decision making process
6	Patients with chronic medical conditions (such as epilepsy) should be counselled about drug use before pregnancy
7	No drug should be prescribed during pregnancy without evidence, knowledge and considerations of prescribers as well as pregnant mothers
8	The risk of an early pregnancy should always be considered when prescribing to a female patient of child bearing age.

Source: Venter (2003)

All drugs and therapeutic substances should be considered harmful until proven safe, as any therapeutic substances could pass from mother to fetus (Victor, 2003). Even coffee drinking (four to seven cups a day) during pregnancy was reported to be associated with an increased risk of stillbirths (Wisborg, Kesmodel, Bech, et al, 2003).

In addition many women may present for the first time to the health care system with their problems because of the use of over the counter drugs (Johnstone, 2000).

2.2 EPIDEMIOLOGY OF DRUG USE IN PREGNANCY

Information on the use of drugs during pregnancy is scarce and rather anecdotal. As a result of that, epidemiological studies in this area are scarce particularly associated with the use of non-prescription drugs (Rubin, 1995). Drug information centers established in few countries like Norway collect routine information regarding drug use during pregnancy. Frost, Widnes and Schjøtt (2009) found physicians in Norway considered the information provided by Norwegian Drug Information Centres on drug use during pregnancy to be of high quality and of significant clinical impact. However, these centers are not usually found in developing countries. As a result of that, most of the information are coming from developed countries in Europe and North America.

About one third of women in the United Kingdom take some drugs at least once during pregnancy, although only 6% take a drug during first trimester. This excludes iron and vitamin supplementation and drug used during pregnancy (Rubin, Craig, Gavin, et al, 1986; Rubin, 1995). An overview of epidemiological studies found a similar pattern in developed countries in North America and Europe (Bonati, Bortolus, Merchetti, et al, 1990). A more recent study found almost one half of all pregnant women in the United States of America received

prescription drugs highlights the importance of the need to understand the effects of these medications on the developing fetus and on the pregnant woman. (Andrade, Gurwitz, Davis, et al, 2004). Previous studies done in the United Kingdom found a significant drop of drug use in during pregnancy. This is probably due to continued attention by news media to drug induced fetal abnormality. However, the use of drugs during puerperium was found to be increased substantially (Rubin, 1995). However, a more recent study in Germany (the PEGASUS-project) found drug utilization during pregnancy was rather common. Eighty five percent of women used at least one preparation. The most frequent groups are haematologicals, minerals, iodide, and vitamins. Interestingly, this study found that very few women recorded folic acid intake during the critical period or insufficient dosage although randomized studies had shown that peri-conceptional folic acid supplementation could considerably reduce the risk of neural tube defects (Irl, Kipferler, Hasford, et al, 1997).

Egen-Lappe and Hasford (2004) examined prescription data of a large cohort of pregnant women (41293) from a German statutory sickness fund and found 96.4% of them received at least one drug during pregnancy (median 7 drugs per women). Almost all of them received vitamins, minerals and iron. Other commonly prescribed drugs were magnesium (61%) which was seldom prescribed outside of pregnancy and iodide (31%), gynaecological anti-infectives (23%), antacids (11%), anti-emetics and anti-nauseants (8%). Potential teratogenic drugs were prescribed to 1.3% of the women.

A study done in Pakistan found all the pregnant women attending the antenatal clinics received a prescription containing at least one drug (mean 1.66 drugs). The majority of them were in third trimester (55.4%) followed by second (33.6%) and first trimester (11.0%). Nutritional supplements like iron, folate, calcium, vitamins, and iron (79.4%) were the most frequently prescribed drugs followed by analgesics (6.2%) and anti-bacterial (2.2%). However, 29 (2.3%) drugs were prescribed which are considered to be teratogenic. Misoprostol was the most

frequently prescribed (n = 6) among the teratogenic drugs for induction of labour followed by carbimazole (n = 5) and methotrexate (n = 5). Twenty nine pregnant women were prescribed these teratogenic drugs (Rohra, Das, AzamI, et al., 2008). A similar study done in Nepal found most of the women got 2-3 drugs and commonly included nutritional supplements like iron, folate, calcium, vitamins (72.8%), followed by tetanus toxoid (12.4%), gastrointestinal (5%), antimicrobials (4.6%) (Das, Sarkar, Datta, et al, 2003).

2.3 DRUG SAFETY IN PREGNANCY

Since the thalidomide crisis, it is well accepted that drugs can have adverse effects on fetus. Careful consideration of the benefit to the mother and the risk to the fetus is required when prescribing drugs during pregnancy. However, there is not enough comprehensive and valid data on the risks of various drug uses during pregnancy. Exposures to various drugs have been found associated with 2 to 3% of all birth defects. Often, the desire for doctors to treat patients in the best way possible plays a role in deciding what technology, procedure or medicine to use (Donnelly, 2009). In view of that many countries have set up systems to collect and provide information on drug safety and in pregnancy. Drug safety classifications in many countries provide estimation of risk and additional evaluations beyond these drug classification systems are often necessary for safer and more rational drug use in pregnancy (Erdeljić, Francetić, Makar-Aušperger, et al, 2010).

2.4 HOSPITAL DRUG SUPPLY

Availability of drugs is crucial to delivery of health services including maternal health services. Therefore, routine availability of affordable and effective drugs is one of the key indicators of quality health services. Patients that have access to adequate and effective drugs when needed were found to be happy with treatment they receive. Satisfaction with drugs received is a key determinant of

utilization of health services and return visits in a public sector (Attridge and Preker, 2005). On the other hand, absence of drugs in health care facilities is a sign of poor quality health services and detrimental to service delivery (Baltussen, Ye, Haddad, et al, 2002). Baultussen, et al. (2002) found that improving drug availability and financial accessibility to health services have been identified as the two main priorities for health policy action. Health policy should be formulated to improve drug availability in hospital setting. The Department of Health has published Essential Drug Lists for Primary health care facilities and Hospitals (adult and paediatric). Hospital essential drug lists provides guidelines for drugs that can be prescribed in hospitals, while essential drug list for primary health care facilities provides guidelines for drugs that can be prescribed in the clinics in South Africa (Department of Health, 2006a). Baltussen, et al. (2002) found that improving drug availability and financial accessibility to health services have been identified as the two main priorities for health policy action. Health policy should be formulated to improve drug availability in hospital setting

2.5 COST OF DRUG USE IN PREGNANCY

Use of drugs requires that patients receive drugs appropriate to their clinical needs in doses that meet their own individual requirements for the adequate period of time and at the lowest cost to them and their community (Moore, et al., 1997). .

It is important to develop an understanding of drug cost in a health facility. Attridge et al, (2005) found that drugs are the most important cost driver of health care expenditure on hospitals and ambulatory care. It is therefore important to monitor cost for drug and pharmaceuticals in a hospital (Cao, Toyabe, Akazawa, 2006).The accurate costing information regarding drugs would assist hospital management to take informed and evidence based decisions on allocation of costs for drugs and pharmaceuticals (Rlewpaiboon, Malaroji and Kongsawatt, 2007).

The Department of Health has developed pricing structure for drugs and pharmaceuticals. Uniform Patient Fee Schedule (UPFS) is used mainly in public health facilities (Department of Health. 2009), whereas National Health Reference Price List (NHRPL) is used in private health facilities (Department of Health. 2006b). The NHRPL is more realistic and UPFS which is highly subsidised price and does not truly reflect the actual cost. Although the information related to use and cost of drugs used for maternity services is readily available in public hospitals in South Africa, it is not systematically analysed.

CHAPTER 3

METHODOLOGY

The methodology for this study was selected on the basis of its aims. The study design is presented first followed by setting and scope of the study, and data collection methods, research tools and data analysis. Finally, issues surrounding ethics are discussed.

3.1 STUDY DESIGN

The study was a cross-sectional study based on retrospective record review of patient's records, pharmacy documents and prescribing protocols.

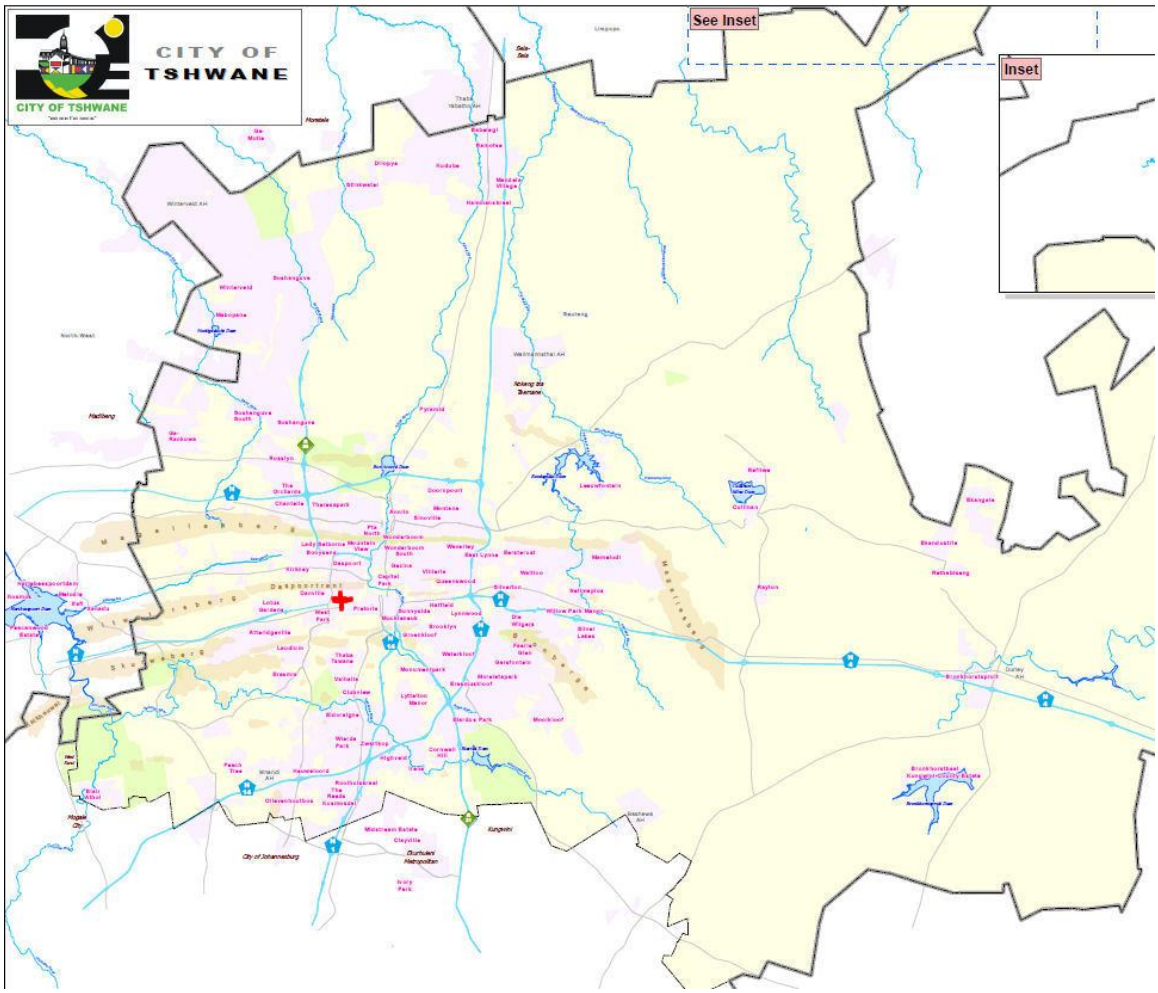
3.2 STUDY SETTING

The study was conducted at Pretoria West District Hospital Maternity Unit. It is one of the four district hospitals in Pretoria in Gauteng Province. It is situated in the western part of Pretoria.

Tshwane District

According to census of 2006, the catchment population of the Hospital is 402 980 who are from following areas: Pretoria West, Danville, Philip Nel, Proclamation Hill, Kwaggasrand, Pretoria Garden Lotus Gardens, West View, Daspoort, Hercules and West Park. The residents come from a mixture of low and middle income class.

Figure 3.1 Tshwane Health District



Pretoria West Hospital

The Hospital is a level one facility. The Maternity Unit has 30 beds. Patients admitted in this Unit are from the Hospital's antenatal clinic and referrals from five clinics and one community health centre situated in the Tshwane District. Referrals are made according to Gauteng referral system. In addition, a significant number of patients walk-in themselves. The Unit only offers level 1 care (such as normal delivery) and any patient who might require level 2 care (such as caesarean sections) are referred to Kalafong Regional Hospital.

3.3 STUDY POPULATION AND SAMPLE

Two thousand and eighty seven patients delivered in the Maternity Unit of the Hospital (n=2087) over the period January 2009 to December 2009. The records of all these patients were included. No sampling was done.

3.4 DATA MANAGEMENT

3.4.1 VARIABLES

Following variables will be used for the study.

Table 3.1 List of variables

Objectives	Variables
1	Quantity of drugs used per category
2	Number of patients delivered
	Socio-Demographic profile of patients received any drugs • Age (years) • Ethnicity • Hospital classification
	Clinical profile of patients received any drugs • Parity • Gestation age at delivery (weeks) • Antenatal diseases • Mode of delivery • Maternal outcome (discharge/ death/ transfer) and complications if any) • Fetal outcome (discharge/ death/ transfer) and complications if any)
	The indications for prescription
3	Cost per category of drugs
	Average cost of drugs per patient
	Total cost of drugs

3.4.2 DATA COLLECTION

Data used for this study were extracted from different sources (Table 3.2). Some of the data (such as demographic profile) was available electronically. The data from these sources were exported to MS Excel based spread sheet (Appendix B) designed for this study. Other information was entered manually/

Table 3.2 Data source

Objectives	Data source
1	Pharmacy records
2	Pharmacy records
	Patients' records
3	Pharmacy records
	Expenditure report from finance department.
	UPFS tariff (Department of Health)

The costing was done based on following formula:

Cost for each drug = Number of units prescribed X price per unit.

The numbers of different drugs prescribed were calculated with the costs of each drug. The total costs for each drug and for all drugs were calculated. This was presented as per patient cost.

Total cost = Σ cost for each drug used

Uniform Patient Fee Schedule (UPFS) was used for costing the drugs in Gauteng Department of Health (Department of Health, 2006b; Department of Health, 2009).

3.4.3 DATA ANALYSIS

Data were captured in MS Excel based data collection tools (Appendix B) and

were checked to eliminate errors. Then it were then analysed with NCSS (2007).

Descriptive statistics were calculated and presented as follows:

- Continuous data with normal distribution: central tendency (mean) and standard deviation
- Continuous data but not normally distributed: central tendency (median) and inter-quartile range
- Categorical date: proportion and ratios

3.5 PILOT STUDY

A pilot study was undertaken to test the data coding sheet to determine whether all the information that had been identified could be collected and that the response categories were sufficient. The pilot was carried out on 10 records of patients who delivered in the maternity ward in May 2010 before commencement of the study. The pilot study confirmed data to be used for this study was available.

3.6 ETHICAL CONSIDERATIONS

Permission for conducting research was obtained from the chief director of the Pretoria Region of the Gauteng Department of Health and Social Development. In addition, the study was approved by the Human Research Ethics Committee: (Medical) University of the Witwatersrand before commencement of the study (Appendix A).

Confidentiality of patient's records requirements were respected and complied with. The information was anonymised with patients' names replaced by unique numbers on data coding sheets. All data coding sheets were stored in a locked filing cabinet. Only the researcher had access to the data coding sheets.

CHAPTER 4

RESULTS

The results obtained from the analysis of data were described in this chapter.

4.1 NUMBER OF PATIENTS DELIVERED AT THE HOSPITAL

The total number of deliveries during the study period is described in the Table 4.1 (Figure 4.1). Total number of deliveries during this period was 2087. The mean number of deliveries was 173 (± 18). The minimum and maximum numbers of deliveries during this period were 148 and 196 respectively. The majority of the patients had normal vaginal delivery (NVD) (2065, 98.95%). Six (0.29%) had breech delivery, one (0.05%) had vaginal birth after caesarean section (VBAC) and 15 (0.72%) had ventouse delivery.

Table 4.1 Number of deliveries at the Hospital during one year

Month	Total	NVD	Breech	VBAC	Ventouse
Jan	187 (8.8%)	186 (9%)	1	0	0 (0%)
Feb.	186 (8.9%)	183 (8.9%)	1	0	2 (13.3%)
March	188 (9%)	188 (9.1%)	0	0	0 (0%)
Apr	180 (.8.6%)	180 (8.7%)	0	0	0 (0%)
May	191 (9.2%)	190 (9.2%)	0	0	1 (6.7%)
Jun	196 (9.4%)	192 (9.3%)	3	0	1 (6.7%)
Jul	183 (8.8%)	182 (8.8%)	0	0	1 (6.7%)
Aug	174 (8.3%)	173 (8.4%)	0	0	1 (6.7%)
Sept	149 (7.1%)	146 (7.1%)	1	1	1 (6.7%)
Oct	149 (7.1%)	146 (7.1%)	0	0	3 (20%)
Nov	156 (7.5%)	154 (7.5%)	0	0	2 (13.3%)
Dec	148 (7.1%)	145 (7%)	0	0	3 (20%)
Total	**2087**	**2065**	**6**	**1**	**15**

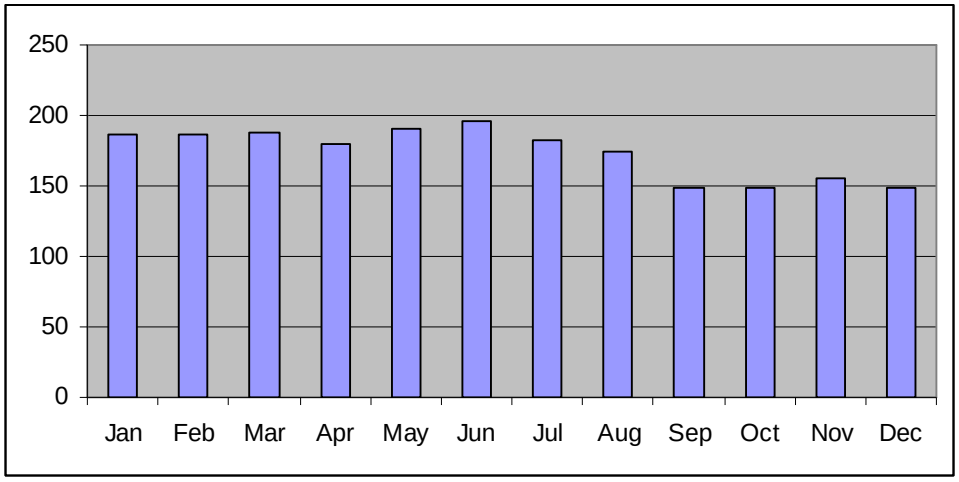


Figure 4.1 Deliveries per month

4.2 SOCIO-DEMOGRAPHIC PROFILES

4.2.1 AGE

The mean age of the subjects was 25 years (± 5.2 years) (Figure 4.2). The minimum and maximum ages were 15 years and 46 years respectively.

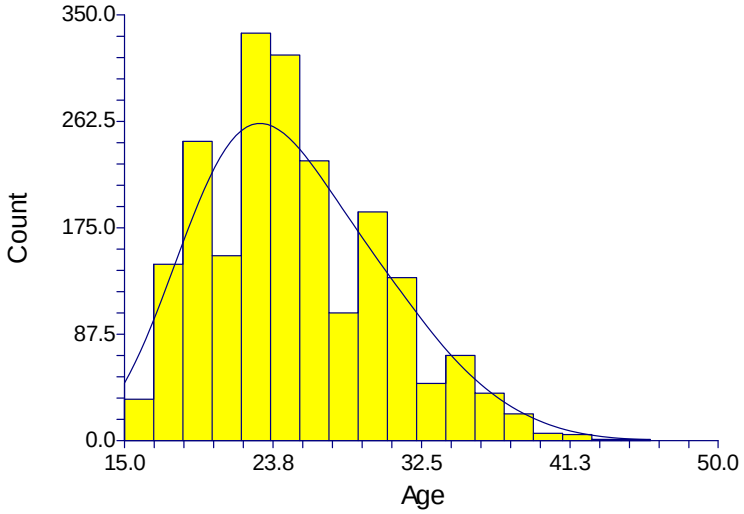


Figure 4.2 Age distribution

4.2.2 ETHNICITY

The ethnicity of the subjects is listed in Table 4.2. The majority of the subjects were black (1667, 79.88%).

Table 4.2 Ethnicity of subjects

Ethnicity	Count	Percentage
Asian	44	2.11%
Black	1667	79.88%
Coloured	42	2.01%
White	334	16%
Total	**2087**	**100%**

4.2.3 HOSPITAL CLASSIFICATION

All patients were classified as H_0 (non-paying patients.

4.3 OBSTETRICS PROFILES

4.3.1 PARITY

The parity of the subjects was described in Table 4.3 (Figure 4.3). The median parity was 1 (Interquartile range 0 to 1).

Table 4.3 Parity of subjects

Parity	Count	Percentage
0	923	44.35%
1	751	36.09%
2	296	14.22%
3	86	4.13%
4	19	0.91%
5	4	0.19%
6	1	0.05%
7	1	0.05%
Total	2087	100%

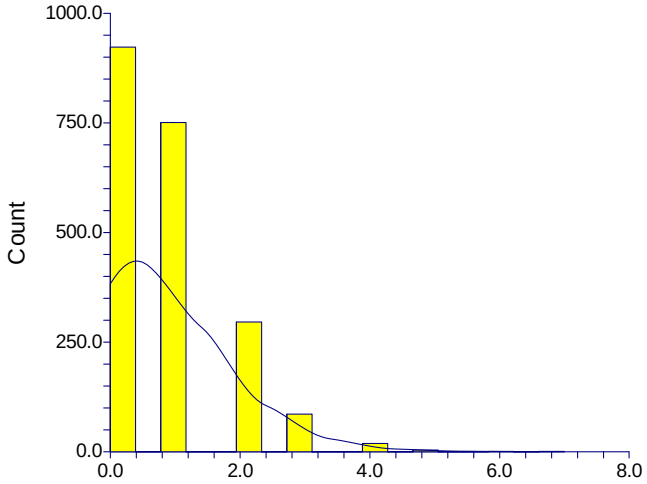


Figure 4.3 Parity of subjects

4.3.2 GESTATIONAL AGE AT DELIVERY

The gestational age of the subjects at delivery were described in Figure 4.4. The gestational age of the subjects at delivery was 38 weeks (± 2 weeks). The minimum and maximum gestational ages at delivery were 26 weeks and 45 weeks respectively.

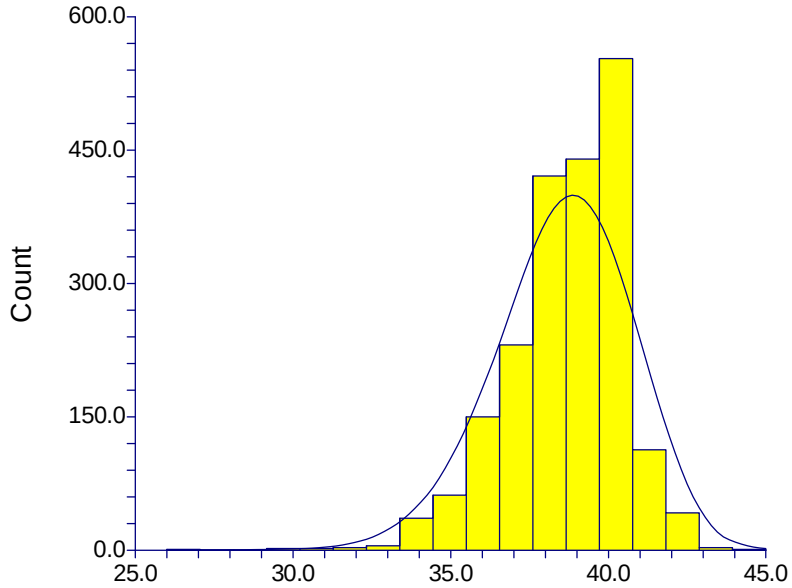


Figure 4.4 Gestational age at delivery

4.3.3 ANTENTAL DISEASES

Only few patients had antenatal diseases and this can be attributed to the screening that identifies with additional medical conditions that require specialist clinical support, and these being refered to Kalafong Hospital. Six were diagnosed with anaemia and seven had pregnancy Induced hypertension. One patient had syphilis. HIV results were available for 1764 patients. Among them 266 (15%) were HIV positive.

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4.3.4 MATERNAL OUTCOME

Postpartum complications are listed in Table 4.4 Postpartum haemorrhage and retained placenta was the most common complications. The majority of the patients were discharged home and only 15 were transferred to Kalafong Hospital for further management.

Table 4.4 Postpartum complications

Parity	Count
Perineal tear	6
Cervical tear	5
Cervical prolapse	1
Postpartum haemorrhage	55
Retained placenta	23
Symphisis Diastasis	1
Total	**91**

4.3.5 PERINATAL OUTCOME

Twelve babies were born pre-maturely. One baby developed pyrexia and two had respiratory distress. The majority of them were discharged home. Fifteen of them were admitted in neonatal ICU and 21 of them were transferred to Kalafong Hospital.

There were one macerated still birth (MSB), two fresh still births (FSB) and one early neonatal death (END) during this period

4.4 DRUG USED

Drugs used during pregnancy are described below. These drugs are organised according to South African Medicines Formulary (University of Cape Town, 2010)

4.4.1 UTEROTONIC DRUGS

The uterotonics (drugs to increase uterine contractions) used for the patients are described in the Table 4.5.

Table 4.5 Uterotonics

ITEM	Quantity	Unit price	Total price
OXYTOCIN			
OXYTOCIN INJ 5IU 1ML	560	R 5.03	R 3238.30
OXYTOCIN INJ 10IU 1ML	2415	R 4.22	R 10,301.90
ERGOMETRINE INJ 0,5MG/ML,1ML	130	R 4.49	R 584.00

Oxytocins are used during delivery to augment uterine contractions. Ergometrine is used after delivery to augment uterine contractions and to prevent postpartum haemorrhage (PPH).

4.4.2 CONTRACEPTIVES

The contraceptives used for the patients are described in the Table 4.6.

Table 4.6 Contraceptives

ITEM	Quantity	Unit price	Total price
MEDROXYPROGESTERONE ACETATE INJECTION LONG ACTING 1ML	29	R 5.83	R 168.97

Medroxyprogesterone acetate is used for women who request it during their post natal period.

4.4.3 ANTIBIOTICS AND ANTIINFECTIVES

The antibiotics used for the patients are described in the Table 4.7.

Table 4.7 Antibiotics and Anti-infectives

ITEM	Quantity	Unit price	Total price
ANTIBIOTICS			
AMOXYCILLIN 250MG 100'S	5	R 17.24	R 115.77
BENZYLPENICILLIN VIAL	1	R 1.64	R 1.64
CEFTRIAXONE FOR INJ 250MG/VIAL	92	R 2.48	R 231.56
CHLORAMPHENICOL EYE OINTMENT 3,5G	92	R 5.60	R 761.90
ERYTHROMYCIN TABLETS 250MG 100'S	23	R 45.45	R 699.64
METRONIDAZOLE 28'S	38	R 1.93	R 221.48
CLOTRIMAZOLE VAGINAL TABLET 500MG 1'S	86	R 14.85	R 1,222.15
ANTIINFECTIVES			
GENTIAN VIOLET 20ML	1	R 3.55	R 3.55

The most commonly used antibiotic was Ceftriaxone, which was used during the whole year. Benzylpenicillin was used only for one RPR positive patient during one month. Amoxycillin was given according to Doctor's prescription. Clotrimazole vaginal tablet is used for vaginal infections.

The Gentian violet lotion is used for wound treatment.

4.4.4 ANTIRETROVIRALS

The antiretrovirals used for the patients are described in the Table 4.8.

Table 4.8 Antiretrovirals

ITEM	Quantity	Unit price	Total price
ZIDOVUDINE TABLETS 60'S	1	R 17.24	R 115.77
NEVIRAPINE TABLETS 1'S	22	R 40.40	R 888.80

Zidovudine and Nevirapine are given to mother who are HIV positive.

4.4.5 GASTRO-INTESTINAL SYSTEM

The medications used for Gastro-intestinal disorders are described in the Table 4.9.

Table 4.9 Medication used for disorders of Gastro-intestinal system

ITEM	Quantity	Unit price	Total price
METOCLOPRAMIDE			
METOCLOPRAMIDE INJ 2ML	23	R 1.23	R 28.29
METOCLOPRAMIDE TABLET 10'S	7	R 0.54	R 3.78
METOCLOPRAMIDE TABLET 100'S	4	R 5.27	R 21.08
METOCLOPRAMIDE TABLET 500'S	0.33	R 18.26	R 6.03
ANTACIDS			
MAGNESIUM TRISILICATE 200ML	1	R 3.92	R 3.92
ALUMINIUM HYDROXIDE GEL 350ML	2	R 10.12	R 20.24
ALL HYDROX+MG TRISILICATE TABLET 24's	4	R 15.35	R 61.40
LIQUID PARAFFIN 200ML	3	R 11.47	R 34.41

Metoclopramide (tablets and injections) are used for nausea. Magnesium Trisilicate is used for gastric upset and Aluminium Hydroxide gel and tablet are used acid reflux. Liquid Paraffin is used for constipation. In addition, it is sometimes used for rubbing into skin of baby (baby oil).

4.4.6 RESPIRATORY SYSTEM

The medications used for disorders of Respiratory system are described in the Table 4.10

Table 4.10 Medication used for disorders of Respiratory system

ITEM	Quantity	Unit price	Total price
SALBUTAMOL 300 DOSE UNIT	5	R 21.48	R 139.43

Salbutamol is used for patients with asthma

4.4.7 CARDIOVASCULAR SYSTEM

The medications used for disorders of Cardiovascular system are described in the Table 4.11

Table 4.11 Medications for disorders of Cardiovascular system

ITEM	Quantity	Unit price	Total price
MAGNESIUM SULPHATE 50% 2ML	482	R 199.80	R 712.56
HYDROCHLORTHIAZIDE 12,5MG 28'S	6	R 2.29	R 13.74
PERINDORPIL 4MG 28'S	10	R 14.69	R 145.20
NIFEDIPINE 30MG CR 28'S	3	R 11.68	R 44.05

All the above drugs are used for hypertension. Hydrochlorthiazide and Perindorpil are used for pregnancy induced hypertension (PIH). Magnesium Sulphate and Nefedipine are used for moderate to severe PIH. Magnesium Sulphate is used intravenously whereas Nifedepine is used sublingually.

4.4.8 HAEMATOLOGICAL SYSTEM

The medications used for disorders of Haematological system are described in the Table 4.12.

Table 4.12 Medications for disorders of Haematological system

ITEM	Quantity	Unit price	Total price
IRON TABLETS			
FERROUS SULPHATE 28'S	28.01	R 1.70	R 47.62
FERROUS SULPH 1000'S	0.04	R 103.20	R 4.13
FE FUMARATE+FOLIC ACID 1000'S	0.04	R 103.20	R 4.13
IMMUNOGLOBULINS			
IMMUNOGLOBULIN ANTI-D(RH)	56	R 481.2	R 26,590.77

Iron tablets (Ferrous sulphate and Ferrous fumerate) are used for all pregnant women to prevent iron-deficiency anaemia.

Immunoglobulin Anti D is used for blood group (rhesus) incompatibility between mother and her baby. It is used for mothers who are rhesus negative and their newborn babies are rhesus positive.

4.4.9 VITAMINS

The vitamins used for the patients are described in the Table 4.13

Table 4.13 Vitamins

ITEM	Quantity	Unit price	Total price
VITAMIN A 200 000IU 250'S	5	R 210.00	R 1050.00
VITAMIN B COMPLEX 10ML	1	R 16.04	R 16.04
THIAMINE 10ML	1	R 20.79	R 20.79
VIT C 5ML	4	R 7.00	R 28.00
VIT B12 1ML	10	R 5.56	R 55.60

All these Vitamins are used as a supplement when required. Vitamin A is given to the mothers in the maternity ward. It is in the National Protocol and giveniven to prevent eye problems, which can lead to blindness. It is transmitted to the baby through breast milk.

4.4.10 ANALGESICS AND ANAESTHETICS

The analgesics and anaesthetics used for the patients are described in the Table 4.14.

Table 4.14 Analgesics and Anaesthetics

ITEM	Quantity	Unit price	Total price
ORAL ANAGESICS			
PARACETAMOL 100'S	56	R 9.06	R 277.02
IBUPROFEN 200MG 84'S	50	R 6.78	R 349.88
PARENERAL ANALGESICS			
HYDROXYZINE 2ML	82	R 14.98	R 1,228.36
PROMETHAZINE 1ML	2	R 2.53	R 5.06
PETHIDINE 50MG	30	R 1.25	R 37.50
PETHIDINE 100MG	80	R 1.48	R 118.40
LOCAL ANAESTHETICS			
LIGNOCAINE 1% 20ML INJECTION	674	R 5.29	R 3,729.26

Paracetamol and Ibuprofen are routinely used for pain management. In addition, Hydroxyzine, Promethazine and Pethidine are used for moderate to severe pain particularly during labour. Lignocaine injection is used for local anaesthesia during suturing episiotomy and perineal tear.

4.4.11 PARENTERALS

The parenterals used for the patients are described in the Table 4.15.

Table 4.15 Parenterals

ITEM	Quantity	Unit price	Total price
SODIUM CHLORIDE			
SODIUM CHLORIDE 0,9% 50ML	19	R 5.03	R 104.37
SODIUM CHLORIDE 0,9% 200ML	28	R 7.33	R 264.58
SODIUM CHLORIDE 0,9% 1000ML	33	R 7.63	R 249.63
RINGERS			
RINGERS 200ML	1	R 9.99	R 9.99
RINGERS 1000ML	2600	R 8.07	R 26,854.20
DEXTROSE 50% 50ML	2	R 22.59	R 44.14
HYDROXYETHYL STARCH 500ML	7	R 57.46	R 391.26
STERILE WATER			
STERILE WATER FOR IRRIGATION 1000ML	8	R 8.74	R 74.40
WATER FOR INJ 10ML	213	R 0.58	R 144.49

Unlike other Sodium Chlorides (200 ml and 1000ml), Sodium Chloride (50 ml) is used to administer IV antibiotics and to keep a line open for other IV administrations. Ringer Lactate (200 ml and 1000 ml) is used on all the patients at the time of admission to Labour ward. Dextrose 50% (50ml) is used for diabetic patients. Hydroxyethyl starch is used as plasma expander. Sterile water is used for irrigation. Water for injection is used for mixing antibiotics.

4.4.12 EMERGENCY MEDICATIONS

The Emergency medications used for the patients are described in the Table 4.16.

Table 4.16 Emergency medications used during this period

ITEM	Quantity	Unit price	Total price
SALBUTAMOL 1MG/ML 5ML	4	R 98.97	R 395.88
LIGNOCAINE AEROSOL SPRAY	1	R104.94	R 104.94
LIGNOCAINE GEL 20ML	2	R 21.91	R 43.82
ADRENALINE 1ML	8	R 1.62	R 12.96
LABETOLOL 20ML	1	R 154.6	R 154.58
AMINOPHYLLINE 10ML	1	R 1.31	R 1.31
HYDROCORTISONE	2	R 10.34	R 20.68
POTASSIUM CHLORIDE 10ML	1	R 1.84	R 1.84
ATROPINE 0,5MG 1ML	1	R 1.79	R 1.79
CALCIUM CHLORIDE 10ML	1	R 2.12	R 2.12

These drugs are only used for emergency trolleys and therefore not frequently used.

4.5 NEONATALS

4.5.1 BIOLOGICAL VACCINES

The biological vaccines used for the newborn babies are described in the Table 4.17.

Table 4.17 Biological vaccines for newborns

ITEM	Quantity	Unit price	Total price
POLIO 10DOSES.VIAL	212	R 27.53	R 5957.35
VACCINE BCG	282	R 23.22	R 8183.05

Polio and BCG are used to vaccinate newborn babies. These two items used routinely throughout the year for the newborn babies.

4.5.2 ANTIRETROVIRALS

The antiretrovirals used for the newborn babies are described in the Table 4.18.

Table 4.18 Antiretrovirals for newborns

ITEM	Quantity	Unit price	Total price
ZIDOVUDINE SYRUP 200ML	51	R 23.98	R 1,213.98
NEVIRAPINE SYRUP 240ML	1	R 40.40	R 40.40

Zidovudine and Nevirapine Syrups are given to babies whose mothers are HIV positive.

4.5.3 PARENTERALS FOR NEWBORNS

The parenterals used for the newborn babies are described in the Table 4.19.

Table 4.19 Parenterals for newborns

ITEM	Quantity	Unit price	Total price
NEONATOLYTE	7	R 13.31	R 93.17
GLUCOSE 5% 200ML	5	R 9.48	R 58.04
SODIUM CHLORIDE 0,9% 10ML	173	R 0.93	R 159.91

Sodium Chloride (10 ml) is used to wipe babies' eyes. Neonatolyte is used for newborn babies when needed (such as distress). Glucose 5% (200 ml) is used for newborn babies when needed (such as distress).

4.5.4 OTHERS

The other drugs used for the newborn babies are described in the Table 4.20.

Table 4.20 Other drugs used for newborn

ITEM	Quantity	Unit price	Total price
PHYTOMENADIONE 0,2ML	1758	R 8.75	R15,642.06
NALOXONE 0,4MG/ML,1ML	35	R 2.40	R 87.50

Phytomenadione (Vitamin K) is given to babies to prevent haemorrhage. Naloxone is used for newborn babies to counteract the effect of Pethidine administered to their mothers during delivery.

4.6 HOSPITAL DRUG SUPPLY

There was no drug stock-out during the study period. According to Pharmacy records no expired stock was identified from the Maternity Unit during the study period. Stock-outs are done weekly by a Pharmacist. Then data is correlated with the medical supply depot report on unavailability of certain items. Expired stock is done monthly. There is an electronic system assisting with batch numbers, which has expired and which will expire in three month's time. 99% accurate. Because of batch number system an item can be followed in different departments.

4.7 COST OF DRUG USED

The cost of drugs used during this period is summarised in Table 4.21

ITEM	Total price
MATERNAL	
Uterotonics	R 14,124.20
Contraceptives	R 168.97
Antibiotics and Anti-infectives	R 3,257.69
Antiretrovirals	R 1,004.57

Gastro-intestinal system	R 179.15
Respiratory system	R 139.43
Cardiovascular system	R 915.55
Haematological system	R 26,646.65
Vitamins	R 1,170.43
Analgesics and Anaesthetics	R 5,745.48
Parenterals	R 28,137.06
Emergency medications	R 739.92
Sub-total Maternal	**R 82,229.10**
NEONATAL	
Biological vaccines	R 14,140.40
Antiretrovirals	R 1,254.38
Parenterals	R 311.12
Others	R 15,729.56
Sub-total Neonatal	**R 31,435.46**
TOTAL	**R 113,664.56**

Total cost for the drugs used during one year study period was R 113,664.56. The average cost per mother (n=2087) was R 39.40 and the average cost per neonate (n=2084) (excluding 3 stillbirth) was R 15.08 respectively.

CHAPTER 5

DISCUSSION

In this chapter, the results obtained from the analysis of the data are discussed and compared with those from other published studies.

5.1 INTRODUCTION

This study was done in order to assess the drugs utilized in the maternity ward at Pretoria West District Hospital. The study also looked at the factors that might influence their uses and their costs during one year study period (1st January to 31 December 2009).

The study population includes the records of all patients who delivered at the Maternity Unit of the Pretoria West District Hospital during the study period. The total number of deliveries was 2087, and the records of all these patients were included as they were readily available. The researcher believes that the sample size for this study is reasonable and the findings of this study could be extrapolated to the Maternity units of other district hospitals in South Africa.

5.2 DEMOGRAPHIC PROFILES

The mean age of the subjects was 25 years (± 5.2 years). Two hundred ninety seven (14%) subjects were teenagers. The majority of the subjects were black (1667, 79.88%).

5.3 OBSTETRICS PROFILES

The median parity of the subjects was 1 (Interquartile range 0 to 1). Almost half of them (44.3%) were primipara and only five of them (0.2%) were grandimultipara (5 or more previous pregnancies).
Only few patients had antenatal diseases probably because the majority of the patients were referred to Kalafong Hospital. Six of them had anaemia and seven had PIH. One patient had syphilis, who was treated with Benzyl Penicillin. Two hundred sixty six (15%) were HIV positive, but only 51 babies received anti-retroviral. The result raises concerns around the effectiveness of the program in place to reduce vertical transmission/mother to child HIV transmission as well as an indication of failure to adhere to Prevention of Mother to Child Transmission Programme (PMTCT). PMTCT is primary prevention of IV infection among child-bearing age women.

It has been estimated that 75 000 children die in South Africa before they reach five years of age. Though there are number of health challenges contributing to these deaths, it is argued that HIV related illnesses account for a large proportion. It is further stated that the most common route for HIV infection for children under age of five years is through mother to child transmission (MTCT) which can occur during pregnancy, labour, delivery and breastfeeding.

It is further estimated that over 90% of new HIV infections among infants and young children may occur through MTCT. If no interventions between 20% and 45% of infants may be infected with HIV through MTCT with risk of 5 – 10% of infections occurring during pregnancy, 10 – 20% during labour and delivery and 5 – 20% through breastfeeding (Strengthening PMTCT through communication: A review of the literature August 2009).

The purpose of prevention of mother to child transmission (PMTCT) programme is to decrease the number of HIV infected babies born to HIV mothers

(Strengthening PMTCT through communication: A review of the literature August 2009).

A comprehensive package of interventions was developed, among which is single dose nevirapine to newborn babies (Policy Guidelines for the Implementation of PMTCT programme.(Department of Health 2008).

The gestational age of the subjects at delivery was 38 weeks (±2 weeks). Twenty three percent (n= 491) had a preterm labour (delivered at gestational age 37 weeks or less). But surprisingly, no anti-tocolytics (to stop uterine contractions) were used. The majority of the patients had normal vaginal delivery (NVD) (2065, 98.95%) as expected in a district hospital. However, the Hospital does not offer CS and refer all patients to Kalafong Hospital.

Postnatally, postpartum haemorrhage (n=55, 2.3%) and retained placenta (n=23, 1.1%) were the most common complications. The majority of the patients were discharged home and only 15 were transferred to Kalafong Hospital for further management.

Twelve babies were born pre-maturely, although 491 mothers had a preterm labour. It implies that the gestational age might not be calculated adequately. The majority of them were discharged home. There were very few perinatal death (n= 4), signifying a good quality services.

5.4 DRUG USED

The use of drug is frequently life saving for mothers and babies and often unavoidable (Sachdeva, et al., 2009) on the other hand, it exposes unborn babies to increase risk of congenital malformations as well as it may impact their intellectual, social and functional development. Venter (2003) listed the key points related to drug use in pregnancy, but in many places this was not always

followed. This study was done in a Maternity unit of a district hospital to develop an understanding of the drugs used in that Unit. The study did not find any drugs used in the Unit which are potentially teratogenic. The Unit has a very low perinatal mortality rate indicating relatively well-managed clinical services in the Unit. Many pregnant women do take over the counter the drugs without prescription (Johnstone, 2000). However, the study did not interview the patients to record if they have used any over-the counter medicines or from other sources. A prospective study would be required to address this.

5.4.1 MATERNAL

The prescription drug use in pregnancy varies between countries. While in the United Kingdom it was reported 33% of the women take some drugs at least once during pregnancy (Rubin, Craig, Gavin, et al, 1986; Rubin, 1995). Similar figures were reported from the United States of America (50%) (Andrade, et al, 2004) as high as 85% in Germany (Irl, et al, 1997). This study found 147 (7%) of the women used drugs. This figure does not include iron and vitamin supplementation. Iron tablets (Ferrous sulphate and Ferrous fumerate) are used for all pregnant women to prevent iron-deficiency anaemia (Rubin, Craig, Gavin, et al, 1986; Rubin, 1995). In this study, all the women were given iron supplement, which is the most commonly used drugs among the patients. Probably because of that there were only six cases of diagnosed anaemia.

Egen-Lappe and Hasford (2004) reported in a study done in Germany frequent use of following drugs namely iodide (31%), gynaecological anti-infectives (23%), antacids (11%), anti-emetics and anti-nauseants (8%) and potentially teratogenic drugs (1.3%). This study found the uterotonics (drugs to increase uterine contractions) were used widely. Ergometrine (to stop PPH) was used for all the patients. Probably because of that only 2.3% patients had PPH. Only 29 (less than 2%) patients were given postnatal contraceptives. This requires urgent attention.

The antibiotics were used in few patients like those reported in other studies (Rohra, et al, 2008). The most commonly used antibiotic was Ceftriaxone, which was used during the whole year. Bezylpenicillin was used only for one RPR positive patient during one month. Only 35 mothers out of 266 HIV positive mothers received antiretrovirals which was too low as compared to the number of mothers delivered during this period, who were HIV positive (n= 266). This requires urgent attention.

Metoclopramide (anti-emetics) and antacids are commonly used drugs in pregnancy but their uses are found to be limited among the subjects. Only few patients (n=7) were treated with PIH. But use of Magenium sulphate and Nifedipine during labour indicated presence of undiagnosed PIH among the subjects. Immunoglobulin Anti D is used for blood group (rhesus) incompatibility between mother and her baby. It is one of the most expensive drugs used in the hospital.

Rohra, et al (2008) reported that nutritional supplements like iron, folate, calcium, vitamins, iron (79.4%) were the most frequently prescribed drugs, which is similar to this study. The vitamins (Vitamin A, Vitamin B complex, Vitamin B12, Thiamine, Vitamin C are used as supplement. However, it is not clear what the indications for their uses were.

Oral analgesics were mainly used antenatal period, whereas parenteral analgesics were mainly used during labour, which is similar to the findings of other study (Rohra, et al, 2008). However, low use of parenteral analgesics signifies the patients were not given adequate pain relief during labour and this policy should be reviewed. Lignocaine injection was used for local anaesthesia during suturing episiotomy and perineal tear.

The parenterals used for the patients were mainly during labour. Ringers Lactate was one of the most expensive items (in terms of total cost) used at the Unit.

Hydroxyethyl starch (used as plasma expander) was one of the items with a high unit cost and used in case of bleeding (such as PPH).

The Emergency medications are found to be seldom used in the Hospital.

5.4.2 NEONATALS

The quantity of biological vaccines (BCG and oral polio) used for the newborn babies are optimum in comparison to number of deliveries.

The antiretrovirals (Zidovudine and Nevirapine syrups were used for fewer newborn babies (n= 51), in comparison to total number of babies born to a HIV positive mothers (n=266) and of concern.

Phytomenadione (Vitamin K) were used for prophylaxis to prevent bleeding as one of the most expensive drugs in terms of total cost.

5.5 HOSPITAL DRUG SUPPLY

Satisfaction with drugs received is a key determinant of utilization of health services and return visits in a public sector (Attridge and Preker, 2005). On the other hand, absence of drugs in health care facilities is a sign of poor quality health services and detrimental to service delivery (Baltussen, et al, 2002). The study found little wastage in the hospitals. The Hospital never had a stock-out during the study period. This was probably due to fewer items used by the Unit. According to Pharmacy records no expired stock was identified from the Maternity unit during the study period.

5.6 COST OF DRUG USED

It is important to develop an understanding of drug cost in a hospital as drugs are the most important cost driver of health care expenditure on hospitals and ambulatory care (Attridge et al, 2005). It is therefore important to monitor cost for drug and pharmaceuticals in a hospital (Cao, et al, 2006; Rlewpaiboon, et al, 2007). Total cost for the drugs used during one year study period was R 113,664.56. Uterotonics, (R 14,124.20) and parenterals (R 28,137.06) were most expensive items used in the Unit. In addition, medications for haematological system (more specifically Anti D Immunoglobulins) were identified as one of the most expensive items (R 26,646.65). The average cost per mother (n=2087) was R 39.40. For the newborns, biological vaccines (R 14,140.40) and Phytomenadione (Vitamin K) (R15,642.06) were given to all the newborns and costed the hospital a significant amount of money. The average cost per neonate (n=2084) (excluding 3 stillbirth) was R 15.08.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

In this chapter, the results obtained from this study were assessed in relation to the aims and objectives of the study, so that appropriate conclusions can be drawn. The limitations of the study were listed. Based on the findings of the study, appropriate recommendations and suggestions for future research were included.

6.1 CONCLUSIONS RELATED TO THE AIMS OF THE STUDY

This was a cross-sectional study that looked at broad issues pertaining to the utilization of drugs in a maternity ward at a district hospital in the Gauteng Province and the factors that might influence its use and their cost over a period of one year.

6.1.1 THE DRUGS USED IN A MATERNITY WARD AT PRETORIA WEST DISTRICT HOSPITAL, OVER ONE YEAR PERIOD

Iron tablets (Ferrous sulphate and Ferrous fumerate) were effectively used for all pregnant women to prevent iron-deficiency anaemia. The second most commonly used drugs are uterotonics (drugs to increase uterine contractions), probably because of that only 2.3% patients had PPH. Postnatal contraceptives were seldom used. The most commonly used antibiotic was Ceftriaxone. Bezylpenicillin was used only for one RPR positive patient during one month. Only 13% HIV positive received antiretrovirals which is too low as compared to number of mothers delivered. Metoclopramide (anti-emetics) and antacids are commonly used drugs in pregnancy but their uses are found to be limited among the subjects. Only few patients (n=7) were treated with PIH. But use of Magenium sulphate and Nifedipine during labour indicated presence of

undiagnosed PIH among the subjects. Immunoglobulin Anti D is used for blood group (rhesus) incompatibility between mother and her baby. It is one of the most expensive drugs used in the hospital. The vitamins (Vitamin A, Vitamin B complex, Vitamin B12, Thiamine, Vitamin C are used as supplement. However, it is not clear what the indications for their uses were. Oral analgesics were mainly used antenatal period, whereas parenteral analgesics were mainly used during labour. Low use of parenteral analgesics signifies the patients were not given adequate pain relief during labour and this policy should be reviewed. Lignocaine injection was used for local anaesthesia during suturing episiotomy and perineal tear. The parenterals used for the patients are mainly during labour. Ringers Lactate was one of the most expensive items (in terms of total cost) used at the Unit. Hydroxyethyl starch (used as plasma expander) was one of the items with a high unit cost and used in case of bleeding (such as PPH). The Emergency medications were found to be seldom used in the Hospital.

The quantity of biological vaccines (BCG and oral polio) used for the newborn babies were optimum in comparison to number of deliveries. The antiretrovirals (Zidovudine and Nevirapine syrups) were used for fewer newborn babies (n= 51), in comparison to total number of babies born to a HIV positive mothers (n=266) and of concern. Phytomenadione (Vitamin K) were used for prophylaxis to prevent bleeding as one of the most expensive drugs in terms of total cost.

6.1.2 THE FACTORS THAT MIGHT INFLUENCE ITS USE

NUMBER OF PATIENTS DELIVERED DURING THIS PERIOD

The total number of deliveries during this period was 2087. The majority of the patients had normal vaginal delivery (NVD) (2065, 98.95%) as expected in a district hospital. However, the Hospital does not offer Caesarean Sections (CS) and refer all patients to Kalafong Hospital.

PATIENT PROFILE (DEMOGRAPHIC AND CLINICAL)

The mean age of the subjects was 25 years (± 5.2 years), 14% of them were teenagers. The majority of the subjects were black (1667, 79.88%). The median parity of the subjects was 1 (Interquartile range 0 to 1). Almost half of them (44.3%) were primipara. Only few patients had antenatal diseases (anaemia, PIH and syphilis) probably because the majority of the patients were referred to Kalafong Hospital. Two hundred sixty six (15%) were HIV positive. Twenty three percent (n= 491) had a preterm labour (delivered at gestational age 37 weeks or less) although no anti-tocolytics were used. Postnatally, postpartum haemorrhage (2.3%) and retained placenta (1.1%) were the most common complications. Twelve babies were born pre-maturely, although 491 mothers had a preterm labour. It implies, the gestational age might not be calculated adequately. There were very few perinatal deaths (n= 4), signifying a good quality services.

6.1.3 THE COSTS OF THE DRUGS USED IN THE MATERNITY WARD DURING THIS PERIOD

Total cost for the drugs used during one year study period was R 113,664.56. Uterotonics, (R 14,124.20) and parenterals (R 28,137.06) were most expensive items used in the Unit. In addition, medications for haematological system (more specifically Anti D Immunoglobulins) are also one of the most expensive items (R 26,646.65). The average cost per mother (n=2087) was R 39.40.

For the newborns, biological vaccines (R 14,140.40) and Phytomenadione (Vitamin K) (R 15,642.06) were given to all the newborns and costed the hospital a significant amount of money. The average cost per neonate (n=2084) (excluding 3 stillbirth) was R 15.08.

6.2 LIMITATIONS OF THE STUDY

The limitations of the study were found to include the following:

- Missing information from ten records in the electronic data base was retrieved from manual records.
- Missing information can cause inaccuracy in data collection leading to inaccurate findings.
- No primary data collection was done for this study therefore the study did not record any self prescription or drugs prescribed by other service providers other than this hospital.
- If primary data was collected it would give the impact and effects of self prescription as well as prescription by the service providers.

The study did not include antenatal clinic. If it was included it would be more useful because some factors such as prescriptions for HIV positive mothers, which would help in early communication of important programmes such as Prevention of Mother to Child Transmission.

Quality of records is also very important for it reflects what was done and given to the patient. If drugs are given to the patient and not recorded this leads to inaccurate information. Quality of data may be affected due to incomplete records

6.3 RECOMMENDATIONS

This project is the first systematic study to be done at the Maternity Unit of the Pretoria West District Hospital. This would assist the Hospital management to develop corrective measures such as better communication between the Maternity Unit and Hospital Pharmacy. The results of the study will be disseminated to the Hospital management, and Chief Director for the District.

Summary of Recommendations:

- Strengthening Prevention of Mother to Child Transmission (PMTCT) by communicating the importance to the patients as well as highlighting the dangers of mother to child transmission.
- Training of all nurses in the maternity ward and antenatal clinic on these programmes will contribute to their strengthening.
- Establishing family planning clinic in the hospital so that mothers can all be attended by a family planning nurse before discharge.
- Strengthening of record keeping through training on data capturing forms.
- Strengthening of clinical audit through auditing files after discharge

6.3.1 FUTURE RESEARCH

Based on findings of this study, the researcher would like to suggest following future studies:

- A prospective study including interview of patient to record self-prescription and drugs prescribed by service providers other than this Hospital.
- A long term prospective study is necessary to understand the long term impact on the babies.
- A prospective study on pain management during labour should be looked at.

6.4 SUMMARY AND CONCLUSIONS

This is probably the first study that documented the use of drugs in the maternity unit in a district hospital. The study found that all the patients were prescribed iron supplements. The second most commonly used drugs are uterotonics. Besides these two items other prescription drugs were prescribed to 7% of patients. Postnatal contraceptives were seldom used. The most commonly used antibiotic was Ceftriaxone. Bezylpenicillin was used only for one RPR positive patient during one month. Only 13% HIV positive received antiretrovirals which is too low as compared to number of mothers delivered. The study found under-prescription of anti-hypertensive drugs. Low use of parenteral analgesics signifies that probably patients were not given adequate pain relief during labour and this policy should be reviewed. The quantity of biological vaccines (BCG and oral polio) used routinely for all the newborn babies. However, the antiretrovirals (Zidovudine and Nevirapine syrups) were used for fewer newborn babies (n= 51), in comparison to total number of babies born to a HIV positive mothers (n=266) and of concern. Total cost for the drugs used during one year study period was R 113,664.56. The average costs per mother and newborn babies were R 39.40 and R 15.08 respectively. Routine availability of affordable and effective drugs is one of the key indicators of quality health. The study showed that affordable and effective drugs were readily available in the Unit. Further prospective study would be able to provide more information in this important subject.

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APPENDICES:

APPENDIX A: ETHICS CLEARANCE CERTIFICATE AND LETTERS OF PERMISSION

APPENDIX B: DATA COLLECTION SHEET