REPRODUCTIVE AND CONTRACEPTIVE KNOWLEDGE AMONG WOMEN WITH HYPERTENSIVE AND CARDIAC DISEASE

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University of Cape Town

Dissertation presented in partial fulfilment of the requirements for the MMed in Obstetrics and Gynaecology

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TABLE OF CONTENTS

DECLARATION BY CANDIDATE

I, Nwabisa Giyose, declare that the work contained in this dissertation is my original work, and work by others has been acknowledged as such.

This study was conducted while I was a registrar in the Department of Obstetrics and Gynaecology at the University of Cape Town, as required by The College of Obstetricians and Gynaecologists of South Africa in partial fulfilment of the requirements of the FCOG II examination.

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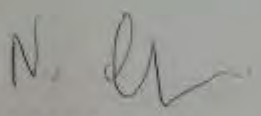
Signature: 

Date: 8 April 2014

DECLARATION BY SUPERVISOR

I have supervised the research which Nwabisa Giyose has undertaken and presented in this dissertation.

I am satisfied that this is her original work and that this dissertation should be submitted in part fulfilment of the requirements for the FCOG (SA) Part II examination.

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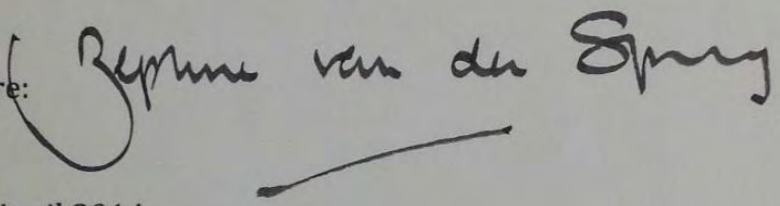
Signature: 

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LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

- ACE - Angiotensin Converting Enzyme
- ANC – Antenatal clinic
- BMD – Bone mineral density
- CAR- cardiac
- CMACHE - Centre for Maternal and Child Health Enquiries of the United Kingdom
- COC- combined oral contraceptive
- HIT – Heparin-induced thrombocytopenia
- HIV – Human immunodeficiency Virus
- HYP-hypertension
- IUCD - Intrauterine contraceptive device
- IUS – Intrauterine system
- INR - International Normalised Ratio, used to monitor anticoagulation activity of vitamin K antagonists such as warfarin
- IQR- Interquartile Range
- KZN – Kwa Zulu Natal
- MDG – Millennium Development Goals
- NCCEMD - National Committee for Confidential Enquiry into Maternal Deaths (South Africa)
- NHANES - National Health and Nutrition Examination Survey
- NYHA - New York Heart Association
- SADHS - South African Demographic and Health Survey
- SLE - Systemic Lupus Erythematosus
- UK – United Kingdom

- USA – United States of America
- TOP - Termination of pregnancy
- WHO – World Health Organisation

ABSTRACT

INTRODUCTION: This study aimed to assess reproductive knowledge and use of contraception in women of reproductive age with cardiac disease or chronic hypertension attending outpatient clinics.

METHODS: This was a prospective descriptive study. Women aged between 18 and 45 years attending cardiac or hypertension clinics at Groote Schuur Hospital, Khayelitsha and Mitchells Plain Day Hospitals were recruited. The study tool was an administered questionnaire which included social, demographic and medical information, knowledge about their condition and the contraceptive history.

RESULTS: Two hundred women were interviewed, 100 with cardiac disease and 100 with chronic hypertension.

Among the 84 cardiac and 90 hypertensive women who had previously been pregnant, there were 193 and 262 pregnancies respectively. Of these participants, 72% cardiac and 70% hypertensive women reported at least one unplanned pregnancy. Unemployed hypertensive women were more likely to have unplanned pregnancies (81%), than their employed counterparts (65%) ($p < 0.03$). In the cardiac group employment did not affect planning of pregnancies.

Forty cardiac and 46 hypertensive women were married. Married women in both groups had more planned pregnancies (46% cardiac, 43% hypertensive) in contrast to those who were not in a relationship (20% cardiac 21% hypertensive)($p<0.03$ cardiac, $p<0.006$ hypertensive).

Sixty two percent cardiac and 82 % hypertensive participants were aware of at least one possible complication from their medical condition while 44% cardiac and 52% hypertensive women knew about some obstetric complication resulting from their medical condition.

Out of 200 women, only 2 were unaware of any contraceptive methods. One hundred and fifty eight participants were using modern contraceptive methods. None of the women accessed contraception at their routine medical clinics and less than half had received contraceptive advice there.

CONCLUSION: This study showed that many pregnancies among participants with medical conditions were unplanned, and there was poor knowledge about the impact of their medical condition on pregnancy. There is an unmet need for reproductive health education in women with medical conditions, and ideally this should be part of the holistic care of any woman with a significant medical condition.

CHAPTER 1: INTRODUCTION AND LITERATURE REVIEW

1. CARDIOVASCULAR AND HYPERTENSIVE DISEASE IN PREGNANCY

Cardiovascular disease in pregnancy is the leading cause of maternal mortality in many developed countries. In the United Kingdom (UK), it was responsible for 60% of indirect causes of maternal deaths (2.2/100000 live births) between 2006 and 2008, and has been on the rise over the past 3 decades.[1,2] In South Africa, it is estimated that approximately 0.6% of pregnancies are affected by cardiac disease.[1] Cardiac disease was responsible for 40% and 36.5% of maternal deaths from pre-existing medical and surgical conditions in the reports of the NCCEMD for the 2005-2007 and 2008-2010 triennia respectively in South Africa.[3,4]

Despite a dramatic decline in rheumatic heart disease in developed countries, it is the second most common cause of heart failure among Africans.[5] In Africa, 500 000 new cases are diagnosed, and 350 000 patients die from rheumatic heart disease annually.[5]

In South Africa, rheumatic heart disease is the most common cardiac pathology in pregnancy, occurring in 71 to 84% of pregnant cardiac patients.[1] In Dakar, Senegal 34% of pregnant women with cardiac disease died between 1994 and 2004. Ninety two percent of these women had rheumatic heart disease.[6] These statistics serve to emphasize the importance of diagnosis, good clinical management and pre-pregnancy counselling in women with cardiac disease.

The commonest cardiac disease in pregnant women in developed countries is congenital cardiac disease which accounts for 80% of cases of cardiac pathology. More women born with congenital heart defects are now reaching child-bearing age and, with advances in cardiac surgery, the childhood mortality has declined over decades.[7]

Despite ischaemic heart disease being responsible for only 20% of cardiac disease in pregnancy, it was responsible for most maternal deaths in pregnant cardiac patients in the UK.[1]

Chronic hypertension is a common medical disorder encountered during pregnancy, which affects 10% of all pregnancies in the United States of America (USA).[8] It is associated with adverse maternal and perinatal outcomes. The risks in pregnancy include exacerbation of hypertension, pre-eclampsia and its complications, intrauterine growth restriction, abruptio placentae and and premature delivery.[8]

In South Africa, hypertensive disease in pregnancy was the second commonest cause of direct maternal death in the 2008-2010 triennium, and was responsible for 14% of all maternal deaths.[4] Five percent of women who died from hypertensive disorders had chronic hypertension.

In developing countries, the challenges of hypertension and cardiac disease include the impact on maternal and perinatal morbidity and mortality. Due to the resource constrained facilities which care for such high risk patients in pregnancy, optimal management is challenging. In many rural parts of South Africa, it may be difficult to manage high risk pregnant patients. This is largely due to lack of essential medical expertise and appropriate facilities. It is obvious that appropriate channels of referral must be in place.

In 2004, cardiovascular disease was the commonest cause of death among all women, and was responsible for 31% of these deaths world-wide.[9] More than 80% of deaths from cardiovascular disease in 2008 occured in low and middle income countries.[10] Changes in environmental and behavioural determinants of cardiovascular diseases e.g. increased tobacco and alcohol use, consumption of fattening and refined food, obesity, diabetes, and lack of exercise among women are responsible for the increase in cardiovascular morbidity and mortality.[10] It is expected that the cardiovascular burden of disease will double from 1990 to 2020.[10] Many deaths from cardiovascular disease tend to occur 10 years earlier in developing countries than in developed countries.[11]

In a survey in Limpopo Province in 2004, it was shown that the incidence of hypertension was 18% among women under the age of 45, with 28% of these women using tobacco and 31% being at least overweight.[12] It was further calculated that 27% of the women in this survey had a 20% chance of developing cardiovascular events in the next ten years. Many of the patients with cardiovascular disease and hypertensive disorders are still in the reproductive age group, and will require special care to manage these conditions when pregnant.

There is a general impression that pregnancy at advanced maternal age is on the rise, and is partly responsible for the increased incidence of cardiac disease and chronic hypertension in pregnancy.[13] According to the South African Demographic and Health Survey (SADHS) in 2003, the prevalence of pregnancy among women over 35 years was 16% in the period of five years prior to the survey.[14] This was comparable to the findings by the National Health and Nutrition Examination Survey (NHANES) III, 1988–1994 in the USA, with a prevalence of 16.1%.[15] We obviously need new updated data to assess this adequately.

2. PHYSIOLOGICAL CHANGES IN PREGNANCY

The physiological adaptive changes that occur in the cardiovascular system in pregnancy are complex. These changes ensure that there is enough blood supply and nutrition to nourish the fetus, and result in a well grown and developed fetus at the end of the pregnancy. The physiological adaptations may lead to cardiac deterioration in patients with underlying cardiac disease. After the pregnancy, it takes two to twelve weeks to return to the pre-pregnancy cardiac state.[14]

An increase in total blood volume occurs as early as the first trimester, reaching its peak around 32 weeks. This is due to a 45% and 17% increase in plasma volume and red cell

mass respectively. A further increase in total blood volume results from auto-transfusion of blood from the uterus following delivery.[16] Cardiac output increases by 40% (from 4.5 to 6 l/min at rest), and this change is as a result of increased stroke volume and a modest increase in heart rate. Stroke volume is dependant on increased preload (increase in blood volume), contractility ability and muscle mass of the heart.[16]

Systemic blood pressure (both systolic and diastolic) drops from the first trimester, reaching the lowest levels during pregnancy in the second trimester, and rises to non-pregnant levels again in the third trimester. This phenomenon is a result of a 30% fall in peripheral vascular resistance due to systemic vasodilatation mediated by progesterone, oestrogen, prostaglandins and nitric oxide, and the growing utero-placental unit.[17]

From the first stage of labour, with each uterine contraction, auto-transfusion occurs whereby blood from the uterus is expelled into the systemic circulation. This results in increased preload, increase in cardiac output by 2.5 l/min, and increased blood pressure.[17] A further 80% increase in cardiac output occurs after delivery due to autotransfusion from uteroplacental unit and relief of inferior vena caval obstruction.[18]

Pregnancy and, especially the puerperium, are associated with a high procoagulant state due to increased production of clotting factors; particularly fibrinogen, decreased Protein S, and suppressed fibrinolytic pathway.[19] Increase in fibrinogen levels begin from the 10th week, with a steady rise throughout the pregnancy and puerperium. This is considered to be the main contributing factor to the hypercoagulable state.[20,21]

3. CARDIAC DISEASE

3.1 PREGNANCY AFFECTS CARDIAC DISEASE

The adaptive cardiovascular changes in pregnancy puts a great strain on patients with pre-existing cardiac disease, sometimes to the detriment of the mother and the fetus. The commonest causes of death in pregnant women with cardiac disease are pulmonary oedema, thromboembolic disease, and haemorrhage from anticoagulants.[1] In pre-existing cardiac disease, additional blood volume can lead to pulmonary oedema.

The physiological increase in resting heart rate, cardiac output, ectopic beats and total blood volume together with the decrease in systemic vascular resistance contribute to development of new cardiac arrhythmias. These are more common in enlarged hearts.[22]

Iron deficiency anaemia is the most common haematological condition in pregnancy, and can result in increased heart rate and cardiac output, leading to high output cardiac failure. Pregnant patients are more prone to infections, particularly of the urinary and respiratory tracts, and in cardiac patients these can also result in a high output state, further aggravating heart failure.

The procoagulant state of pregnancy can cause thrombosis of abnormal and prosthetic valves, mural thrombi in poorly contractile heart chambers, and venous circulation. Pulmonary thromboembolic disease will worsen pulmonary hypertension, and thrombosis of valves leads to heart failure. Embolism from cardiac wall mural thrombi and thrombosis of valves may result in a life threatening embolic cerebrovascular event.[19]

Bioprosthetic valves are less thrombogenic, and do not require anticoagulation. They are, however, less durable than metallic valves and tend to deteriorate quicker in younger patients. The rate of failure in bio-prosthetic valves after 10 years of placement among patients younger than 40 years is 20% to 30%.[20] Repeat surgery exposes patients to a 5% mortality rate.[19]

Cardiac patients in labour are especially vulnerable to pulmonary edema due to increased cardiac output and blood pressure as a result of uterine contractions, pain, and fluid overload.[18] Epidural anaesthesia in cardiac patients helps to reduce pain and hence the risk of pulmonary oedema from pain-induced tachycardia.[22] In patients with fixed cardiac output, however, the epidural anaesthesia causes peripheral vasodilation secondary to sympathetic blockade and results in reduction in venous return.[23] Cardiac output will fall which may precipitate heart failure.

Cardiac patients need careful monitoring by experienced anaesthetists and use of inotropic drugs may be necessary.[24] Caesarian section carries an additional risk due to blood loss, anaesthesia, and risk of sepsis. Risk of haemorrhage is further increased if the patient is anticoagulated.[19]

3.2 CARDIAC DISEASE AFFECTS PREGNANCY

Cardiac disease in pregnancy is associated with higher fetal loss when compared to pregnancy without heart disease, with perinatal mortality ranging from 9 to 24 per 1 000 deliveries.[1] A small study in Pakistan looked at perinatal outcome of patients with cardiac disease, and reported 18% of babies were small for gestational age, 3% were still born, and 3% had an early neonatal death due to prematurity.[25]

In the USA, a cohort study of women with congenital heart disease in pregnancy found that 25% of pregnancies had adverse neonatal outcomes.[26] Premature delivery occurred in 20%, small for gestational age infants in 8.3% and respiratory distress syndrome in 8.3%. Risk factors for poor neonatal outcomes included New York Heart

Association (NYHA) class III-IV, maternal cyanosis, maternal left heart obstruction, smoking during pregnancy, multiple pregnancy, and use of anticoagulants throughout pregnancy.[26]

In mothers with congenital heart disease, the risk of congenital heart defect in the fetus is higher than in general population. The risk of an affected fetus varies with the nature of the heart lesion, for Tetralogy of Fallot it is 2.5% and with congenital aortic stenosis, 18%. If a congenital heart defect is present in the fetus, there is a 5% risk of an associated chromosomal anomaly in the affected fetus. It is recommended that fetal echocardiography is performed at 18 to 22 weeks in women with congenital heart disease and amniocentesis is offered in the event of a fetal cardiac defect.[17,27]

4. HYPERTENSION

4.1 PREGNANCY AFFECTS HYPERTENSIVE DISEASE

In hypertensive patients with renal disease, whether as a secondary cause or a complication of hypertensive disease, pregnancy can lead to clinical deterioration of renal function. Women with moderate to severe renal impairment, systemic lupus erythematosus (SLE), mesangiocapillary glomerulonephritis, renal scleroderma and polyarteritis nodosa tend to decompensate when they become pregnant.The latter two conditions are considered to be absolute contraindications to pregnancy.[28]

4.2 HYPERTENSION AFFECTS PREGNANCY

The risk of pre-eclampsia, and its complications in patients with chronic hypertension, is 17-25%.[29] A prospective interventional study done in the UK and Netherlands showed that 22% of pregnant women with chronic hypertension developed superimposed pre-eclampsia. Forty four per cent of patients with superimposed pre-eclampsia presented before 34 weeks.[30]

Chronic hypertension without pre-eclampsia, is an independant risk factor in pregnancy. In a study in the USA the incidence of preterm births in patients with chronic hypertension was almost 15%, compared to background risk of 9.6%.[31] Chronic hypertension in the study by Chapell et al also carried a risk of abruptio placentae (1.56%), fetal growth restriction (up to 50%), stillbirth (2%) and neonatal death (1%).[30]

The risks are significantly higher in the presence of severe hypertension, target organ damage predating the pregnancy, and in secondary causes such as vasculopathies, renal disease, and endocrinopathies.[28]

5. MEDICATION AND PREGNANCY

Some medication used to treat cardiac disease and hypertension is known to be teratogenic, and should be adjusted when pregnancy is planned or confirmed.

The incidence of warfarin embryopathy when warfarin is administered in the first trimester is 0.6-10%, and is dose-dependent, reaching 8% when given in doses of more than 5mg a day between 6 and 12 weeks.[19] The risk of fetal intraventricular haemorrhage is always present when warfarin is used throughout the pregnancy, and is especially increased when the INR is above therapeutic levels.

The long half-life of warfarin may cause haemorrhagic disease of the newborn if warfarin has not been stopped timeously before delivery. Vaginal delivery in patients who are fully anticoagulated with warfarin is contra-indicated because it may result in intracranial haemorrhage in the fetus.[19] Caesarian section has then to be performed under general anaesthesia, with the possible complications from the anaesthesia and increased risk of maternal haemorrhage.

Angiotensin Converting Enzyme (ACE) - inhibitors are known to cause fetal renal dysgenesis with resultant oligohydramnios in 14% and anuria in 15% of exposed cases.[31] They are also associated with renal failure, pulmonary hypoplasia, intrauterine growth restriction and fetal death, and should be avoided in all the trimesters. Certain beta-blockers, particularly atenolol, are associated with fetal growth restriction.[32]

Alternative and less teratogenic treatment options may be less effective, and compromise the health of the patient. Heparin is the anticoagulant preferred to warfarin because it does not cross the placenta. In patients with prosthetic valves, it is usually used instead of warfarin from 6-12 weeks to avoid teratogenicity[33], and from 36 weeks to avoid prolonged anticoagulation in the fetus, and the mother. It is less effective than warfarin as an anticoagulant. In a review by Chan et al (2000), the risk of valve thrombosis when unfractionated heparin was used was 9.2% compared to 3.9% when using warfarin in pregnancy.[33] The case fatality rate from valve thrombosis has been reported to be 15%.[17]

Unfractionated heparin requires parenteral administration, more frequent monitoring, and it carries a risk of drip site sepsis and infective endocarditis. Long-term use of heparin of more than eight months is associated with osteoporosis. Unfractionated heparin given throughout the antenatal period is associated with a 5% decline in bone mineral density (BMD).[34] Heparin-induced thrombocytopenia (HIT) is caused by antibody-mediated destruction of platelet-heparin complexes. It is a life-threatening complication associated with unfractionated heparin use, and not low molecular weight heparin. The risk is low in pregnancy (0.1 %).[35]

Methyldopa has been discontinued for decades as a mainstream antihypertensive agent in the general population. In pregnancy, it has the longest fetal safety track record, and is often used as a first line antihypertensive in pregnancy. Due to its long onset of action, it is not ideal for treatment of severe hypertension presenting as an emergency. It also

causes somnolence, dizziness, and depression, and may be less well tolerated than modern antihypertensives.[32]

6. STRATEGIES TO REDUCE MATERNAL MORTALITY

South Africa was among 189 countries that committed to the 8 Millennium Developmental Goals (MDG) at the Millennium Summit in September 2000.[36] Millennium Development Goal (MDG) 5(a) intended to reduce maternal mortality ratio by 75% from 1990 to 2015, and MDG 5(b), (added in 2007) to achieve universal access to reproductive health. The South African National Committee for Confidential Enquiry for Maternal Deaths (NCCEMD) provides key recommendations to prevent maternal deaths.[3]

- Improving health care provider knowledge and skills in providing emergency care and ensuring adequate screening and treatment of the major causes of maternal death.
- Improving quality and coverage of reproductive health services, namely contraception and termination of pregnancy services.
- Management provision of staffing and equipment norms, transport and availability of blood for transfusion.
- Community involvement and empowerment regarding maternal, neonatal and reproductive health in general

Despite these strategies, the maternal mortality rate remains very high in South Africa and we will fail to meet MDG 5(a) by 2015. In Sub-Saharan Africa, maternal mortality rate per annum has been dropping at a steady rate of only 1% per annum instead of recommended 5.5% to meet MDG 5 by 2015, and it is unlikely that the other Sub-Saharan countries will meet the MDGs in 2015.[37]

Sri Lanka, a low-income country, has, however, managed to reduce their maternal mortality rate from 2140/100 000 in the 1930's to 38/100 000 live births in 2004 by their Safe Motherhood programme. The programme ensures that contraception and maternity care are accessible to all women from different communities.[38] This indicates the possibility of reducing maternal morbidity with well-structured and supported contraceptive programmes.

6.1 CONTRACEPTION

The most obvious primary prevention of maternal mortality is to prevent unintended pregnancies with appropriate use of modern contraception. It is imperative that women with medical conditions use effective contraceptive methods to reduce the additional burden of disease associated with pregnancy, until their condition has been optimised.

Family planning is one of the great public health achievements of the 20th century especially in developed countries, where it is widely accepted and used. In 2002 61% of all women and 72% of married women in the USA used contraception.[38] In South Africa, some modern contraceptive methods are offered free of charge in public health facilities and are essential components of primary health care services. The SADHS in 2003 showed that 83% of women using contraception obtained their methods from the public health sector and mostly at primary health care centres.[14]

Uptake of contraception by women in developing countries has steadily increased between 1990 and 2005.[38] In Ethiopia, use of modern contraceptive methods increased from 6% in 2000 to 30% in 2009 among married women aged 15–49 through education and extended family planning services.[6]

WHO has noted a slow expansion of the use of contraception in some developing countries, particularly Sub-Saharan countries and, as a consequence, the number of teenage pregnancies remained the same from 1990 to 2007.[37] Use of contraception still

is lowest among the poorest, uneducated women especially in rural areas. In Sub-Saharan African surveys, only 22% of women, married or in union, between 15 to 49 years of age used contraception in 2007.[38]

Inconsistent use of contraception and unintended pregnancy rate remain very high in South Africa. A community survey conducted in Potchefstroom reported that 60% of pregnancies were unintended despite seemingly high contraception use (69%) and knowledge (93%).[39]

In North America it has been demonstrated that the commonest reasons for engaging in unprotected coitus were barriers to access to contraception (49%), unplanned coitus (45%), and not believing in the possibility of falling pregnant (42%).[40] Wood and Jewkes (2006) found that the low use of contraception among women in Limpopo was due to poor knowledge regarding contraception, fear of adverse effects, unaddressed misconceptions, and social and logistical barriers to access the service.[41]

Contraception use was associated with stigma among University of Natal students (male and female) participating in a survey to assess contraception and abortion knowledge.[42] More than 40% of participants believed that women who use contraception were promiscuous. Only 60% believed that contraception prevented pregnancy, and 12 % believed that it did not. University students are more educated than the average South African population, and more knowledge about contraception and less prejudice would be expected in this group.

Unintended pregnancies add to the risk of termination of pregnancy (TOP) and associated complications. Despite the Choice of Termination of Pregnancy Act of 1996 and TOPs being offered free of charge in public health facilities, many women in South Africa still repeatedly seek illegal and unsafe TOPs.[43,44] The incidence of unsafe

abortions is not known, but it is estimated that that 450 women die annually from illegal TOPs in South Africa.[44]

6.2 PRECONCEPTION CARE

The United Kingdom Centre for Maternal and Child Health Enquiries (CMACHE) recommends that women of child-bearing age with pre-existing medical and psychiatric conditions should be offered preconception counselling.[2] This should be routinely offered at every level of care and the opportunity for proactive counselling is always available whenever patients interact with health care facilities.

Discussion should begin from the time when acquired heart disease or chronic hypertension are diagnosed and at menarche when congenital heart disease is present. It should continue at regular intervals even when the patients do not raise their own reproductive issues. Topics should include contraceptive options, and plans about childbearing, if relevant.

Counselling should cover risks that pregnancy would add to the medical conditions, and the risk that the medical conditions would pose to the health of both patient and fetus during pregnancy. Patients should be made aware of any teratogenic medication they use, and should be counselled about the need to adjust therapy when conception is planned.

When considering pregnancy, women should be assessed while on contraception. If they are medically unwell before pregnancy, they are likely to decompensate during pregnancy. Contraception should be continued until their condition is optimised.

Women who do not desire to fall pregnant can be counselled on various contraceptive methods available, and offered the most suitable method for cardiac disease or hypertension. Women utilizing contraception should be assessed for satisfaction and side-effects of the methods they currently use, and alternative contraception be offered if necessary. Side-effects from contraception are common reasons for discontinuation in women not planning to conceive[41] and may result in unintended pregnancies which compromise the woman's health.

6.3 ANTENATAL CARE

Eighteen per cent of South African women who died from cardiac disease in the last triennium (2008-2010) did not receive antenatal care.[4] In South Africa the Minister of Health announced the introduction of free health care services for pregnant women and children under the age of 6 years in July 1994. The SADHS in 2003 reported that 92% of pregnant women attended at least one antenatal clinic (ANC) visit and about three-quarters had at least four visits before delivery.[14]

Moodley et al reported that despite 94% of pregnancies being confirmed by 4 months of amenorrhoea, only 23.4 % booked before 20 weeks.[45] The rest of the women either did not book (28.7 %), or booked later than 20 weeks (47.9%). Myer and Harrison (2006) reported that women who booked late lacked education about the importance of antenatal care. More than 50% believed that they could not book before fetal movements were felt, despite confirmed pregnancy status. Some did not see any benefit to antenatal care, and perceived early booking as an unnecessary inconvenience.[46]

In a community based cross-sectional study in Empangeni KZN, the authors reviewed the knowledge of danger signs, or pregnancy complications, and HIV status among pregnant women.[47] Knowledge of danger signs, which were used as a surrogate marker for antenatal health education, was found to be lacking in almost half of women who attended for antenatal care.

7. AIMS AND OBJECTIVES

Because of the high maternal mortality in women with cardiac disease and hypertension, we wished to assess the knowledge of their medical disorders in women with cardiac or hypertensive disease in relation to their reproductive practices.

The aims and objectives of the study were to assess among affected women:

- Past and current use of contraception among women with cardiac disease and chronic hypertension
- Knowledge of the impact of cardiac disease and chronic hypertension on pregnancy
- Knowledge of impact of pregnancy on cardiac disease and chronic hypertension
- Knowledge of contraception among women with cardiac disease and chronic hypertension
- Accessibility of contraception and contraceptive advice to women with cardiac disease and chronic hypertension

CHAPTER 2: METHODS

This was a prospective descriptive study. The protocol was approved by the Human Research Ethics Committee of University of Cape Town in January 2013 (HREC Ref: 565/2012) (see appendix 1).

PARTICIPANTS

The study population was recruited by convenience sampling at the various clinical sites, and consisted of women of reproductive age with chronic hypertension or cardiac disease. The convenience sampling method was chosen because it was the most practical. The proportion of eligible participants was very small, and the majority of patients attending the clinics were not suitable for the study. All the patients that fulfilled the criteria for the study were approached.

Inclusion criteria:

- Women between ages of 18 and 45 years
- Women with cardiac disease or chronic hypertension attending cardiac or hypertension clinics
- Patients willing to consent to participation in the study

Exclusion criteria:

- Women who were pregnant at the time of the study. These women were deliberately excluded as we believed that discussing pregnancy complications could arouse excessive anxiety and distress during their index pregnancies.
- Women who were unwilling to participate
- Women who could not understand the study
- Women younger than 18 and older than 45 years

QUESTIONNAIRES

Questionnaires for patients with hypertensive disorders and cardiac disease were designed (see appendix 2 and 3). The structure of the questionnaire was adapted for the hypertensive and cardiac group from a previously approved questionnaire from contraception studies that have been previously conducted in the Reproductive Medicine Unit within the Department of Obstetrics and Gynaecology. Each questionnaire had some specific questions relevant to cardiac disease and hypertensive disorders. The questionnaires contained 83 open and closed-ended questions, and questions were asked in the same order in both questinnaires. They covered the following areas:

- *Demographics: Age, population group, religion, home language, marital status, educational background, economic status,*
- *Social history, including marital status, and substance use*
- *Detailed medical history and medication*
- *Detailed obstetric history*
- *Knowledge of impact of pregnancy on the medical condition.*
- *Knowledge of impact of medical condition on pregnancy*
- *Knowledge of contraception. History of contraceptive use*
- *Accessibility of family planning services to patients*

English and Xhosa versions of the questionnaire were available. The questionnaire was initially piloted in 10 hypertensive and 10 cardiac patients, and modified as necessary. The questionnaires were administered by the principal investigator and, well-trained experienced full-time research nurses from the Reproductive Medicine Unit at University of Cape Town.

The study proposal was presented to the Head of the Hypertension Unit, Prof Bryan Rayner, and the Head of Cardiology, Dr Mpiko Ntsheke at Groote Schuur Hospital. They

both gave permission for the investigators to recruit at Groote Schuur Hospital. We were given permission from the Provincial Department of Health to recruit at the special clinics in Khayelitsha and Mitchells Plain Community Health Centres.

RECRUITMENT

All the investigators who participated in the study were trained by senior research nurses within the Reproductive Medicine Unit who are employed by the University of Cape Town. Recruitment occurred from 2 February 2013 until 31 August 2013, initially at the Cardiac and Hypertension clinics, Groote Schuur Hospital and later at Hypertension and INR clinics in Mitchells Plain and Khayelitsha Community Health Centres. The nursing sisters and clerks at the clinics were informed about the study but were not involved in recruitment. They allowed the investigators to identify folders of women who would be suitable by date of birth from the folder cover.

We then approached all women who fulfilled the criteria in the waiting rooms, and asked for their permission to participate in the study. We explained the objective of the study and how we were going to collect data, and supplied them with information leaflets (see Appendix 4). Women who were willing to participate were asked to provide written consent (Appendix 5). The original questionnaires and consent forms were kept in Reproductive Medicine Unit office in a secure environment.

DATA CAPTURING AND ANALYSIS

Information from completed cardiac and hypertension questionnaires was coded and entered into a database using Windows Excel spread sheets. Data were re-entered and double checked for any errors. Data were analysed by Miss Ushma Galal from the University of Cape Town using SPSS: IBM SPSS Statistics, Version 22 and R:R Core Team (2013).

Continuous data was displayed using boxplots. It was analysed using Wilcoxon-Mann-Whitney U-test because the data was abnormally distributed. Categorical data were presented as two-way contingency tables. As most of the tables had cells with expected counts of less than 5, Fisher's exact test was used instead of Chi Square test to assess associations between groups. Because the Fischer's exact test yields similar results as the Chi Square test when expected count is above 5, for consistency, the statistician chose to use the Fischer's exact test for all categorical data. A p-value <0.05 was considered to be statistically significant.

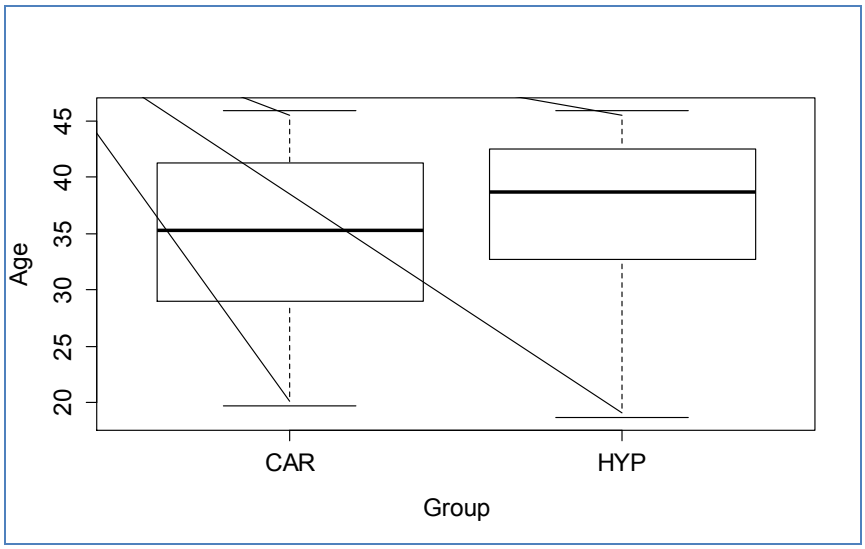
CHAPTER 3: RESULTS

We recruited patients attending cardiac and hypertension specialist clinics at Groote Schuur Hospital, Khayelitsha and Mitchells Plain Community Health Centres. We identified 104 hypertensive and 102 cardiac women who were eligible for the study. Only 4 hypertensive and 2 cardiac patients declined to participate due to time constraints. One hundred women from each group were interviewed.

DEMOGRAPHIC HISTORY

Figure one shows age distribution with mean age and IQR of participants in both groups. The mean age of the cardiac participants was 35.25 years (range 19.75-45.92) while the hypertensive women were slightly older (mean 38.66 years, range 18.07-45.92) (Wilcoxon-Mann-Whitney U-test p = 0.033).

FIGURE 1: AGE DISTRIBUTION OF PARTICIPANTS



The ethnicity of the participants is presented in Table 1. The interviews were conducted in English and Xhosa.

TABLE 1: ETHNICITY OF PARTICIPANTS

	BLACK SA	COLOURED	WHITE	FOREIGN	TOTAL
CARDIAC	43	49	3	5	100
HYPERTENSION	54	41	3	2	100
TOTAL	97	90	6	7	200

Religious affiliations were similarly distributed in both groups. There were 80 cardiac and 82 hypertensive women who belonged to Christian religion. The rest belonged to Islamic religion (16 cardiac and 18 hypertensive women). Four cardiac women were affiliated to a traditional African religion.

The number of married women in both groups was comparable (40 cardiac and 46 hypertensive patients). Among the participants, there were 22 cardiac and 10 hypertensive women who were single and not in a relationship (Table 2).

TABLE 2: MARITAL STATUS OF PARTICIPANTS

	CARDIAC	**HYPERTENSION**
SINGLE NOT IN A RELATIONSHIP	22	10
STABLE RELATIONSHIP, NOT COHABITING	24	26
STABLE RELATIONSHIP AND COHABITING	5	6
MARRIED	40	46
DIVORCED	6	4
SEPARATED	3	5
WIDOWED	0	3
TOTAL	100	100

The majority of participants had some level of secondary education (n=167). Eighteen had only primary education and 15 had completed tertiary education (Table 3).

There was no statistical significant difference in education between the two groups (Fisher's Exact test p=0.343)

TABLE 3: EDUCATION LEVEL OF PARTICIPANTS

	CARDIAC	**HYPERTENSION**
PRIMARY SCHOOL	6	12
HIGH SCHOOL NO MATRIC	51	53
MATRIC, NO TERTIARY	36	27
TERTIARY COMPLETE	7	8
TOTAL	100	100

The smoking and alcohol history is shown in Table 4. A total of 8 hypertensive women had used cannabis and at the time of the study there was only one current user. None of the cardiac women had used recreational drugs.

TABLE 4: SOCIAL HABITS OF PATICIPANTS

	CARDIAC	HYPERTENSION
CIGARETTE SMOKING	n	n
YES	19	17
NO	67	71
STOPPED <6 months ago	0	1
STOPPED >6 months ago	14	11
ALCOHOL CONSUMPTION	n	n
YES	22	18
NO	61	65
STOPPED <6 months ago	1	2
STOPPED > 6 months ago	16	15
DRUG USE	n	n
YES	0	1
NO	100	92
STOPPED <6 months ago	0	1
STOPPED >6 months ago	0	6
TOTAL	100	100

EMOTIONAL AND SOCIO-ECONOMIC HISTORY

Most of the women in both groups felt that they had emotional support. Twenty eight cardiac and 23 hypertensive women had at least two sources of support. There were, however, 5 cardiac women all of whom were unmarried and 3 hypertensive women 2 of whom were married who said they had no emotional support (Table 5).

TABLE 5: EMOTIONAL SUPPORT OF PARTICIPANTS

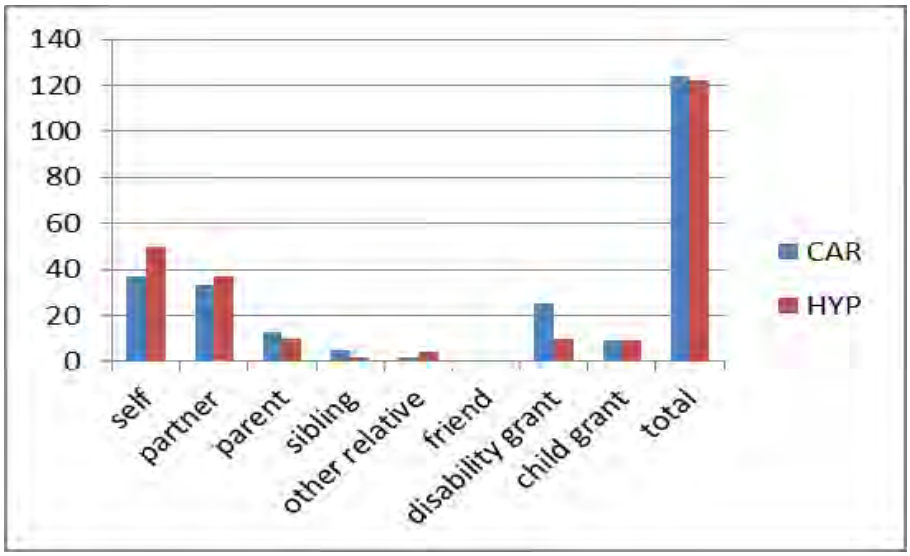
NUMBER OF SOURCES	CARDIAC	HYPERTENSION
0	5	3
1	65	74
2	18	23
3	10	0
5	1	0
6	1	0
Total	100	100

Employment is shown in Table 6. Thirty six cardiac and 35 hypertensive women were unemployed, 18 cardiac and 7 hypertensive women received disability grants, and 34 cardiac and 41 hypertensive women had formal low to middle income jobs. Eighteen cardiac and seven hypertensive women received disability grants. All participants had financial support, often from more than one source (Figure 2).

TABLE 6: EMPLOYMENT OF PARTICIPANTS

	CARDIAC	HYPERTENSION
Unemployed	36	35
Self-employed	5	9
Casual employment	6	18
Formal employment	28	23
Student/scholar	2	2
Housewife	5	5
Disability grant	18	7
Charity work	0	1
Total	100	100

FIGURE 2: FINANCIAL SUPPORT OF PARTICIPANTS



None of the women were homeless, although some of the housing appeared to be suboptimal (Table 7). The difference in housing between the two groups was statistically significant (Fisher's exact test p=0.05), with more of the hypertensive patients utilizing informal housing.

TABLE 7: HOUSING OF PARTICIPANTS

	CARDIAC	HYPERTENSION
Formal housing on separate stand	33	32
Flat	12	7
Semi-detached house	16	8
Separate entrance	7	6
Wendy house	9	4
Shack	20	42
Room in main dwelling	3	1
TOTAL	100	100

SEXUAL AND CONTRACEPTION HISTORY

Two cardiac and 3 hypertensive women who were interviewed had never been sexually active. The mean age of first coitus in cardiac and hypertensive women was 19.1 (IQR 17-21) and 18.1 (IQR 16-20) respectively (Table 8).

TABLE 8: AGE AT FIRST COITUS OF PARTICIAPNTS

	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
CARDIAC	14.00	17.00	18.00	19.18	21.00	29.00
HYPERTENSION	11	16.00	18.00	18.15	20.00	27.00

The mean age of first contraception use was 20.6 years (12-34) in cardiac and 19.4 years (10-35) in the hypertension group. Most women (56 cardiac and 58 hypertensive) had a lag period of at least one year between first intercourse and initiating contraception use. Twenty six cardiac and 24 hypertensive women initiated coitus and contraception simultaneously, while 11 cardiac and 12 hypertensive women initiated contraception after intercourse. There were 5 cardiac and 3 hypertension women whose data were categorised as missing who either could not remember first coitus or first contraception (Table 9).

TABLE 9: FIRST COITUS IN RELATION WITH FIRST CONTRACEPTION

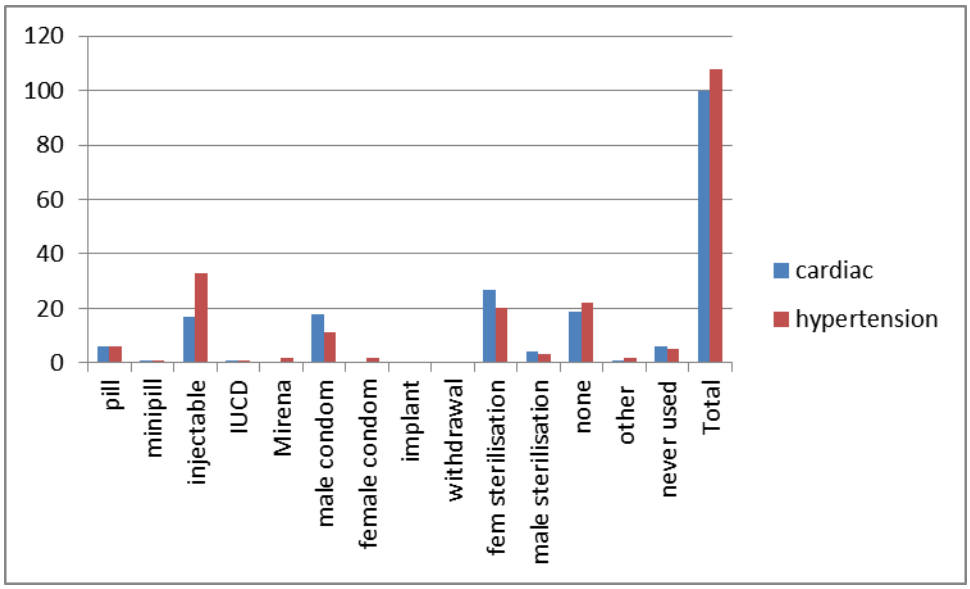
	CARDIAC	HYPERTENSIVE
COITUS BEFORE CONTRACEPTION	56	58
COITUS WITH CONTRACEPTION	26	24
COITUS AFTER CONTRACEPTION	11	12
NEVER HAD COITUS	2	3
MISSING DATA	5	3
TOTAL	100	100

At the time of the interview, 75 cardiac and 73 hypertensive women were using contraception. There were 19 cardiac and 22 hypertensive women who had discontinued contraception. Five of the 6 cardiac and 3 of the 5 hypertensive women who had never used any contraceptive method were sexually active. Current contraceptive use was not affected by emotional support (Fisher's exact test p=1.000 in both groups).

The most commonly used methods of contraception among cardiac women were female sterilisation (n=27), male condom (n=18), and injectable progestogens (n=17). Cardiac

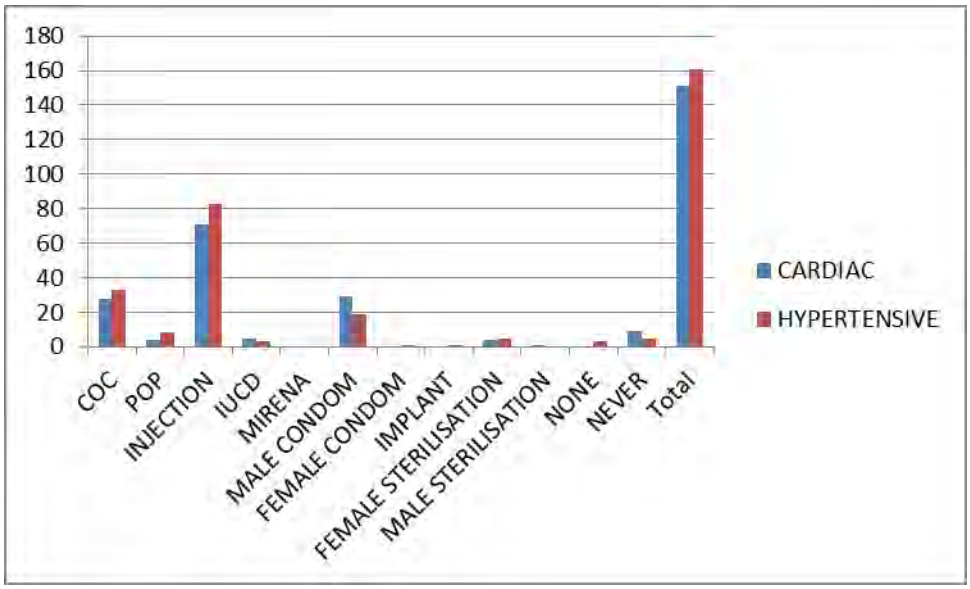
women who were more than 10 years from their diagnosis were more likely to be sterilised than those with a duration of disease less than 10 years, however this did not reach statistical significance (Wilcoxon p-value=0.237). Among hypertensive women, injectable progestogens (n=33), female sterilisation (n=20), and male condom (n=11) were the most common contraceptive choices. Only two women from both groups used male condoms with another contraceptive method. There was one patient from each group who was using the IUCD at the time of the interview. There were only 2 hypertensive women who used the intrauterine system (IUS). Long-term implants and female condoms were not used by any patients interviewed (Figure 3).

FIGURE 3: CURRENT CONTRACEPTION USE



Many women had previously used injectable progestogens (71 cardiac and 83 hypertensive women), COC (28 cardiac and 33 hypertensive women), male condoms (29 cardiac and 19 hypertensive women) and IUCD (5 cardiac and 3 hypertensive women) (Figure 4).

FIGURE 4: PREVIOUS CONTRACEPTION USE



Most women received contraception from family planning clinics (29 cardiac and 36 hypertensive women) or a Day Hospital (12 cardiac and 22 hypertensive women). Two cardiac women and 5 hypertensive women accessed contraception from more than one source. None of the women received contraception at their cardiac or hypertension clinics (Table 10). Some women felt that contraceptive services were not user-friendly (20 cardiac and 33 hypertensive), and not accessible (8 cardiac and 13 hypertensive).

TABLE 10: SOURCES OF CONTRACEPTION FOR PARTICIPANTS

	CARDIAC	HYPERTENSIVE
FAMILY PLANNING CLINIC	29	36
DAY HOSPITAL	13	22
GENERAL PRACTITIONER	4	3
CARDIAC/HYPERTENSION CLINIC	0	0
PHARMACY	6	5
OTHER HOSPITAL SERVICES	1	0
OTHER	5	1
PREVIOUS STERILIZATION	29	20
NO CONTRACEPTION	15	18
TOTAL	102	105

Even though 71/100 cardiac and 75/100 hypertensive women felt comfortable about possibly discussing contraception at their respective clinics, only 29 cardiac and 23 hypertensive women had received contraceptive advice at the clinics. Fifty two cardiac and 67 hypertensive women reported never to have received contraceptive advice from their medical clinics. Fifty two cardiac and 59 hypertensive patients reported that they would like the doctors or nurses in their medical clinics to give them information regarding contraception.

Women who were diagnosed with hypertension more than 10 years previously were more likely to be advised against pregnancy and offered sterilisation (Wilcoxon-Mann-Whitney U-test $p<0.001$). This correlation was not observed in the cardiac group. Twenty three of 25 cardiac women, and 10 of 15 hypertensive women who were advised to consider sterilisation by health care workers had not elected to have the procedure.

OBSTETRIC HISTORY

Table 11 reports the gravidity of the women in both groups. Sixteen cardiac and 10 hypertensive women had never been pregnant.

TABLE 11: GRAVIDITY OF WOMEN IN BOTH GROUPS

GRAVIDITY	CARDIAC	HYPERTENSION
0	16	10
1	24	11
2	30	24
3	17	34
4	10	10
5	2	7
6	1	2
7	0	2
Total	100	100

Mean age at first pregnancy among cardiac and hypertensive participants were 22.52 (range 14- 37) and 20.00 (range 13-29) respectively (table 12).

TABLE 12: AGE AT FIRST PREGNANCY

	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
CARDIAC	14.00	20.00	21.00	22.52	25.00	37.00
HYPERTENSION	13.00	18.00	20.00	20.60	23.00	29.00

The total number of pregnancies among cardiac women was 193, with 21 miscarriages, 3 social TOPs and 1 ectopic pregnancy. Four women had stillbirths, and there were no early neonatal deaths. The total number of surviving children was 167. The total number of pregnancies among hypertensive women was 262, with 38 miscarriages, 14 stillbirths and 6 early neonatal deaths. None of the hypertensive patients had a history of TOP or ectopic pregnancy. There were 206 surviving children in the hypertension group.

Ninety eight of 193 pregnancies among cardiac women had maternal complications which included hospital admissions (n=5), ICU admissions (n=16), pulmonary edema (n=10), arrhythmia (n=10), pre-eclampsia (n=10), haemorrhage (n=8), and thrombo-embolic events (n=5).

Maternal complications among women with hypertension occurred in 165 of 262 pregnancies and included hospital admissions (n=76), ICU admissions (n=15), kidney failure (n=4), pre-eclampsia (n=5), abruption (n=4). Other complications among the hypertensive group included anemia (n=3), eclampsia (n=1), stroke (n=1), pulmonary edema (n=1), gestational diabetes (4), infection (n=2), blindness (n=1), unspecified (n=3). A longer duration of the medical condition significantly correlated with the occurrence of maternal complications in both cardiac (Wilcoxon $p=0.036$) and hypertensive women (Wilcoxon-Mann-Whitney U-test $p<0.001$).

The timing of diagnosis of the medical conditions varied and is shown in Table 13. The majority of patients were diagnosed after pregnancy. There were significantly more

women diagnosed with hypertension for the first time during pregnancy than cardiac women (n=42 vs 18, Fisher's Exact test p<0.001).

TABLE 13: TIMING OF DIAGNOSIS IN RELATION TO PREGNANCY

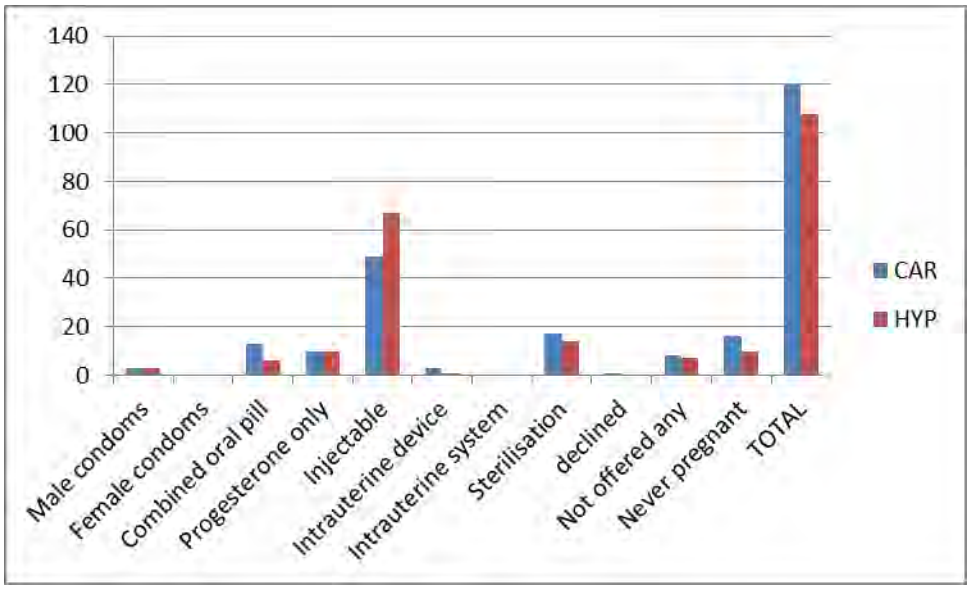
	CARDIAC	**HYPERTENSION**
DIAGNOSED DURING PREGNANCY	18	41
DIAGNOSED AFTER PREGNANCY	52	40
DIAGNOSED BEFORE PREGNANCY	14	9
TOTAL	84	90

Contraception was reported to have been offered to cardiac and hypertensive women after 164 of 193 and 216 of 262 pregnancies respectively. One cardiac and no hypertensive patient declined the offer of contraception. Eight cardiac and 8 hypertensive patients stated that they were not offered contraception after any of their pregnancies.

Women diagnosed with cardiac disease before pregnancy were less likely to be offered contraception in the post-partum period than women diagnosed after pregnancy (n=8, 57% cardiac before pregnancy, n=46, 88% diagnosed after pregnancy), however this was not statistically significant (Fisher's Exact test p=0.06). In the hypertension group, contraception was offered more frequently to women who were diagnosed before pregnancy (n=8, 89%) than those diagnosed after pregnancy (n=31, 77%), but this was also not statistically significant (Fisher's Exact test p=0.08).

After delivery cardiac patients were most frequently offered injectable progestogens (n=49) followed by sterilisation (n=17), COC (n=13) and progestogen only pill (n=10). Postpartum hypertensive women were most frequently offered injectable progestogen (n=67) followed by sterilisation (n=14), progesterone only pill (n=10) and combined oral contraception (n=6). Condoms for contraception were reported to have been offered to only 3 cardiac and 3 hypertensive women (Figure 5).

FIGURE 5: CONTRACEPTION OFFERED AFTER PREGNANCY



Sixty one cardiac (72%) and 63 hypertensive (70%) women had at least one unplanned pregnancy. The number of unplanned pregnancies was 120/192 in cardiac and 132/262 in hypertensive groups. There was no statistical difference in age distribution (Wilcoxon-Mann-Whitney U-test p=0.214 in cardiac and p=0.297 in hypertension), emotional support (Fisher's Exact test p=1.000 in cardiac and p=0.551 in hypertension), knowledge of contraception (Fisher's Exact test p=1.000 in both groups) or education (Fisher's Exact test p=0.553 in cardiac and p=0.390 in hypertension) between planned and unplanned pregnancies. In the cardiac group, there was no association between employment and planning of pregnancy (Fisher's exact test p=0.403).

In the hypertensive group, unemployment was associated with unplanned pregnancies as 81% of unemployed women had unplanned pregnancies compared to 65% of working women (Fisher's Exact test p= 0.03).

Some of the reasons given by the participants for unintended pregnancy included lack of contraceptive knowledge (n=33 cardiac, n=9 hypertensive), contraception failure (n=17 cardiac and n=13 hypertensive), discontinuation of contraception due to side-effects (n=13 cardiac and n=18 hypertensive women), and delay in obtaining contraception (n=2 cardiac and n=15 hypertensive). Fifteen cardiac women gave no reasons for not

using contraception and 4 stated that they were advised against contraception because of their medical condition.

MEDICAL HISTORY OF CARDIAC GROUP

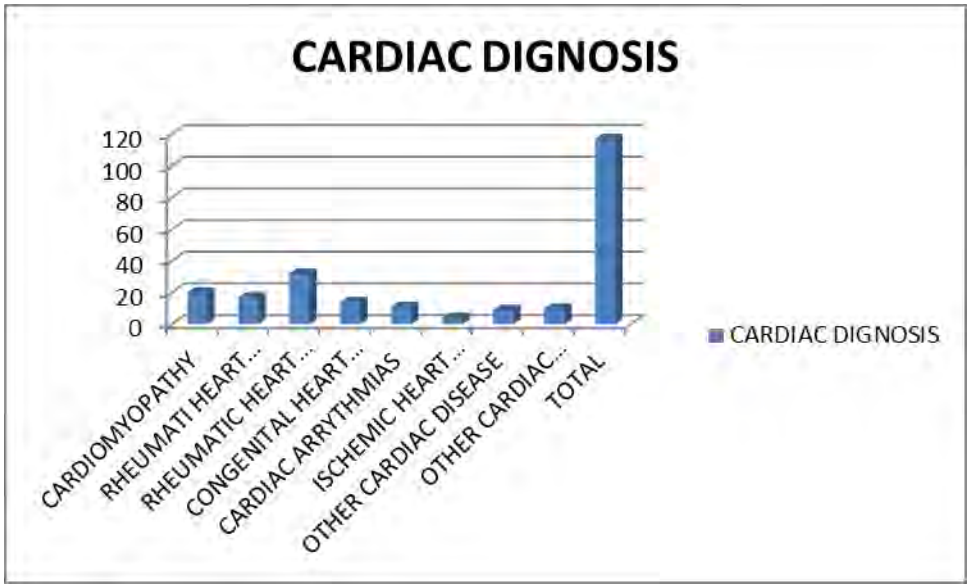
The mean age at first diagnosis of cardiac disease was 21 years (range 1.0-43.00) (Table 14). The mean duration of disease was 12 years (range 0.33-39.58).

TABLE 14: AGE AT FIRST DIAGNOSIS OF CARDIAC DISEASE

	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
CARDIAC	1.00	11.00	23.00	21.81	32.25	43.00

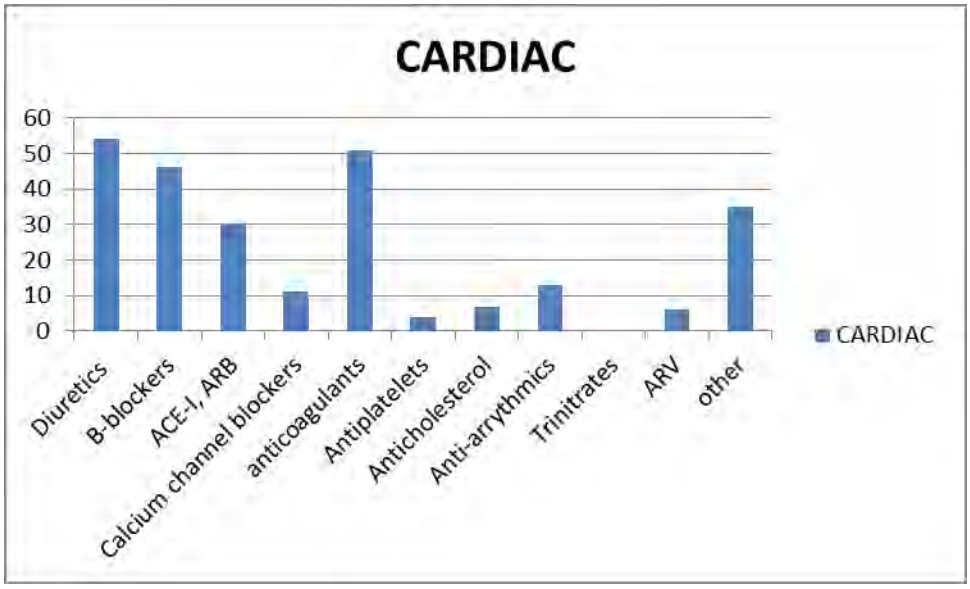
The most common cardiac pathology was rheumatic heart disease with a total of 50 patients. Thirty three of these women had valve replacement surgery (n=28, on warfarin), and 17 had not. There were 21 cardiomyopathies (n=2, cardiac arrythmias), 14 congenital heart disease (n=4, corrected surgically), isolated cardiac arrhythmia (n= 12), 4 ischemic heart disease (n=1, with cardiac arrhythmia), 1 Takayashu's disease, 1 arteriosis, 1 aortic dissection with surgery (Figure 6). Forty six percent of the women had a family history of cardiac disease.

FIGURE 6: NATURE OF CARDIAC PATHOLOGY



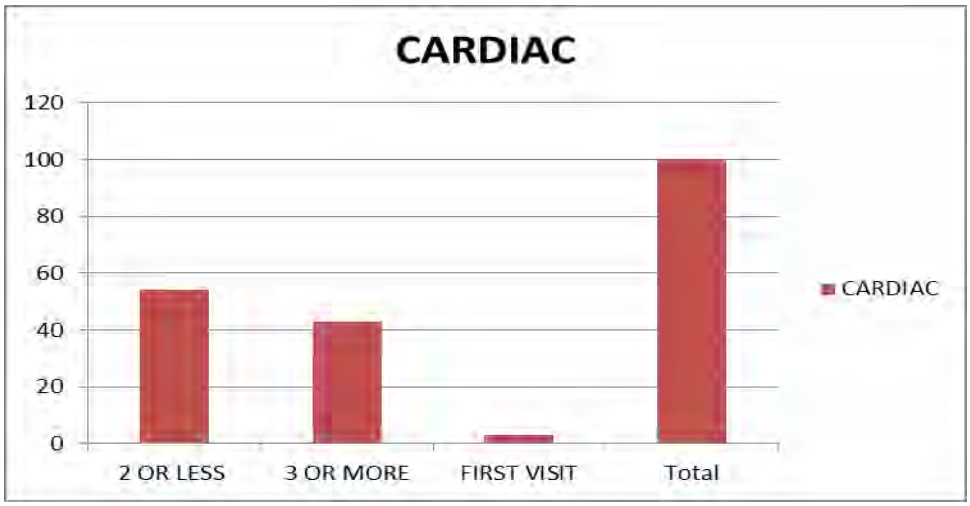
Eighty seven women were on medication for cardiac disease. The mean duration of treatment was 11 years (IQR 2.58-22.96). The most commonly used medications included diuretics (54/100), warfarin (51/100), B-blockers (46/100), and ACE-inhibitors or angiotensin receptor blockers (30/100) (Figure 7). Only 4 patients were not on any medication.

FIGURE 7: MEDICAL TREATMENT FOR CARDIAC GROUP



Forty cardiac patients had co-morbidities which included hypertension (n=16), HIV (n=9), and stroke (n=3). Twenty one had other medical conditions included Marfans Syndrome(1), lymphoma (n=2), asthma (n=4), musculoskeletal conditions (n=7), gastro-oesophageal reflux (n=3), major depressive disorder (n=1) , Noonan syndrome (n=1) and epilepsy (n=1). The longer the duration of cardiac disease, the more frequent were co-morbidities (p=0.036). There were only 3 cardiac women interviewed who were attending the clinic for the first time. Most of the participants were regular attenders with at least one scheduled visit per year (Figure 8).

FIGURE 8: NUMBER OF SCHEDULED VISITS PER YEAR IN CARDIAC GROUP



MEDICAL HISTORY OF HYPERTENSION GROUP

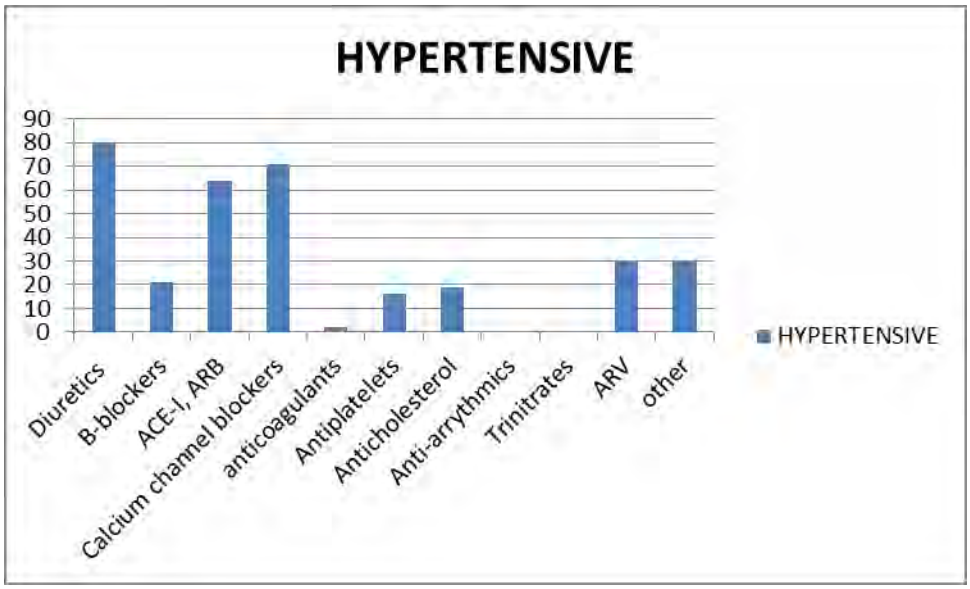
The mean age at first diagnosis of hypertensive patients was 29.26 years (range from youngest to oldest 13.00-44.00 years) (Table 15). The mean duration of disease was 7 years (range 0.17-32.92 years).

TABLE 15: AGE AT FIRST DIAGNOSIS OF HYPERTENSION

	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
HYPERTENSION	13.00	24.00	29.50	29.26	35.25	44.00

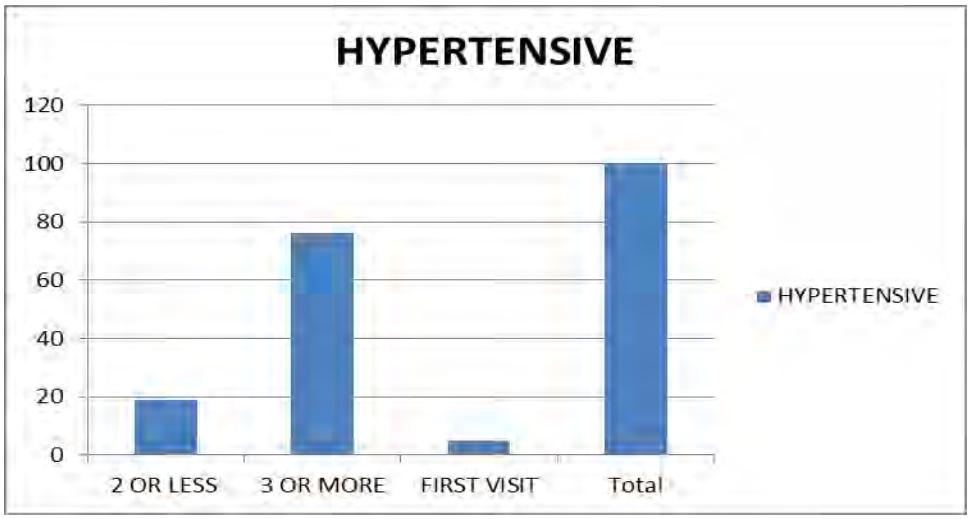
There were 55 women with co-morbidities. These included HIV (n=11), diabetes (n=9), renal disease (n=5), cardiac disease (n=4), and stroke (n=3). Unlike the cardiac group, a longer duration of hypertension was not associated with the presence of co-morbidities (Wilcoxon p=0.755). Family history of hypertension among the hypertensive women was significantly higher than the family history of cardiac disease in the cardiac group (81% vs 46%, Fisher's test p<0.001). All the hypertensive participants were on treatment. The patients had been on medication for an average of 5 years (IQR 2.08-19.7). Many participants were on diuretics (80), calcium channel blockers (71), ace-inhibitors or angiotensin receptor blockers (64), and b-blockers (Figure 9).

FIGURE 9: MEDICAL TREATMENT FOR HYPERTENSIVE GROUP



There were only 5 hypertensive women interviewed who were attending the clinic for the first time. Most of the participants were regular attenders with at least one scheduled visit per year (Figure 10).

FIGURE 10: NUMBER OF SCHEDULED VISITS IN HYPERTENSIVE GROUP



MEDICAL AND REPRODUCTIVE KNOWLEDGE

When asked to mention complications from cardiac disease and hypertension, 62 cardiac and 82 hypertensive women mentioned at least one of the recognised complications (Fisher's exact test p=0.03). The complications mentioned in the cardiac group were heart failure (26) and stroke (24), and in the hypertensive group, stroke (64), cardiac disease (37), renal disease (13), retinopathy (5), malignant hypertension (4) and pregnancy complications (3) (Table 16).

TABLE 16: KNOWLEDGE OF MEDICAL COMPLICATIONS IN BOTH GROUPS

	CARDIAC		HYPERTENSION	
KNOWLEDGE OF COMPLICATIONS	**MENTIONED**	**NOT MENTIONED**	**MENTIONED**	**NOT MENTIONED**
CARDIAC DISEASE	-	-	37	63
RENAL DISEASE	-	-	13	87
RETINOPATHY	-	-	5	95
PREGNANCY COMPLICATIONS	-	-	3	97
MALIGNANT HYPERTENSION	-	-	4	96
STROKE	24	76	64	36
NONE VOLUNTEREED	38	62	18	82
OTHER	19	81	30	69
HEART FAILURE	26	74	-	-
NEED FOR HEART SURGERY	8	92	-	-
INFECTIVE ENDOCARDITIS	1	99	-	-
HEART ATTACKS	11	89	-	-
PREGNANCY WOSENS HEART	10	90	-	-
ARRYTHMIAS	2	98	-	-

Patients were asked to volunteer information, without prompting, on how cardiac disease or hypertension could adversely affect pregnancy and 56 cardiac and 48 hypertensive women were not aware of any possible complications. The most common pregnancy complications mentioned in the cardiac group were stillbirths (n=13), congenital abnormalities (n=11) and fetal growth restriction (n=10). Others mentioned preterm births (n=5), TOP as result of cardiac disease (n=5), bleeding from medication (n=4), miscarriages (n=2), and maternal death (n=1).

Hypertensive patients mentioned the following complications: still births (n=29), miscarriages and TOP (n=12), and preterm births (n=11), maternal death (n=7), congenital abnormalities (n=7), and seizures (n=4).

Education level, employment status, and emotional support did not influence knowledge of pregnancy complications from cardiac disease and hypertension among the participants of this study.

Patients were then asked how pregnancy could affect cardiac disease or hypertension. Some cardiac (n=38) and hypertensive (n=55) women could not give an answer (Fisher's Exact test p=0.023). Cardiac participants mentioned worsening cardiac disease (n= 49), death (n= 9), bleeding from warfarin (n= 2), need to change medication (n=2), arrhythmias (n= 2). Hypertensive participants mentioned worsening of hypertension (n= 28), death (n=3), pre-eclampsia (n= 3) and worsening of kidney disease (n= 3). The age of participants, emotional support, education, employment, previous maternal complications, family history of medical conditions and number of clinic visits were not associated with knowledge of impact of pregnancy on medical conditions in either group.

Cardiac and hypertensive women were asked, without prompting, to mention all contraceptive methods they knew about. Ninety nine cardiac and 99 hypertensive women mentioned at least one modern contraceptive method. The one cardiac woman who failed to mention any method had never been sexually active and had never used contraception. The one hypertensive woman who also failed to mention contraceptive method already had an unplanned pregnancy.

The most known contraceptive methods in the cardiac group were injectable progestogens (n=90), COC (n=66), male condoms (n=53), intrauterine contraceptive device (n=32), female sterilisation (n=15) and minipill (n=11). Male sterilization (n=4), Mirena (n=4) and long-term implants (n=1) were infrequently mentioned.

Hypertensive women mentioned injectable progestogens (n=91), COC (n=74), male condom (n=45), IUCD (n=36), female sterilization (n=23) and the minipill (n=9). Male sterilization was mentioned by 3 hypertensive women. Mirena and long-term implant were not mentioned by the hypertensive women (table 17).

TABEL 17: KNOWLEDGE OF CONTRACEPTION

	CARDIAC	HYPERTNSION
COC	66	74
MINIPILL	11	9
INJECTABLES	90	91
IUCD	32	36
MIRENA	4	0
CAP	2	1
MALE CONDOM	53	45
FEMALE CONDOM	16	12
IMPLANT	2	1
RHYTHM METHOD	1	2
WITHDRAWAL	2	1
ABSTINENCE	4	1
SPERMICIDE	1	0
FEMALE STERILIZATION	15	23
MALE STERILIZATION	4	3
MORNING AFTER PILL	1	1
NONE OF THE ABOVE	1	1
PATCH	1	0

Some women felt that there was insufficient information regarding pregnancy and their medical condition (n=47 cardiac and n=56 hypertensive), or about contraception and cardiac disease or hypertension (n=41 cardiac and n=52 hypertensive). Seventy five

cardiac and 74 hypertensive participants mentioned that they would like to receive additional information regarding pregnancy and contraception specific to their medical condition during their medical consultation. Many women suggested booklets (n=36 cardiac, n=35 hypertensive), individual counselling sessions (n=17 cardiac, n=20 hypertensive), group talks (n=13 cardiac, n=14 hypertensive), posters (n=4 cardiac, n=6 hypertensive), and videos (n=2 cardiac, n=5 hypertensive) as ways of delivering information regarding reproductive health.

Women also mentioned local clinics (n=25 cardiac and n=25 hypertensive), family planning clinics (n=19 cardiac and n=16 hypertensive), family doctors (n=7 cardiac, n=5 hypertensive) and relatives (n=8 cardiac and n=7 relatives) as other trusted sources that they would consult for contraceptive information.

SUMMARY OF RESULTS

- Many women in both groups had first coitus as teenagers at least one year before initiating contraception.
- Eighty four cardiac and 90 hypertensive women had previous pregnancies
- 72% of cardiac and 70% of hypertensive women had at least one unplanned pregnancy. Age, emotional support, education, housing, knowledge of contraception did not have an impact on unintended pregnancy. Among hypertensive women unemployment was associated with unintended pregnancy.
- Injectable progestogens, female sterilisation and male condoms were the most used contraception. However only 18 cardiac and 11 hypertensive women used condoms. There were 25 cardiac and 27 hypertensive women who were not using any contraception.
- Most women accessed contraception from family planning clinics and day hospitals. None of the women accessed contraception from their medical clinics.
- Many women reported that they had never received contraceptive advice from their medical clinics. They felt that information about their medical conditions and reproductive health was limited. Some women who were advised to consider bilateral tubal ligation had not agreed to the procedure.
- Knowledge of contraceptive methods was high, however there was limited knowledge and use of long-term reversible contraception such as IUCD and Mirena.
- Knowledge of the impact of medical disease on pregnancy, and the impact of pregnancy on medical disease was limited in both groups, even in the women who had previous complications related to the medical conditions in their pregnancy.
- The majority of women reported that they would like their physicians to discuss contraception with them during consultations. Many women mentioned that

they would like to receive additional information on reproductive health in the form of booklets, audiovisual media, individual consultations and group talks.

CHAPTER 4: DISCUSSION

This study showed that despite the relatively high contraceptive knowledge, current and previous contraception use, most women with significant cardiac and hypertensive disease who were interviewed still had unplanned pregnancies. Knowledge of the impact of their medical condition on reproductive health was lacking. Women were also not advised on reproductive health issues and were not accessing contraception at their medical clinics. Many women indicated that they would appreciate receiving contraceptive advice which impacted on their medical conditions.

Despite the burden of poor maternal and perinatal outcome in women with pre-existing medical conditions, and high contraceptive knowledge among participants, 72% of cardiac and 70% of hypertensive women in our study had at least one unintended pregnancy. The finding was significantly higher than the rate found in South African and Kenyan studies that investigated the prevalence of unintended pregnancy among women (59.7% SA study[39], 24% Kenyan study[49]). In contrast to our study, a community-based study conducted in Kenya found significant association between age and type of settlement and unintended pregnancy. Similar to the Kenyan study, hypertensive women who were married or employed were more likely to plan their pregnancy compared to unmarried and unemployed hypertensive women. There was no association between marital and employment status and unintended pregnancy among the cardiac women.

Women who were attending family planning clinics in a North American multi-centre study had stated they were not using contraception because it was not accessible (49%), they were not planning on having sex (45%) and sex felt better and more natural (42% and 41%).[40] There were no women interviewed in our study who expressed these views.

The majority of women in our study initiated coitus in their teenage years, and at least one year before initiating contraception use. This put them at risk of unintended

teenage pregnancy and pregnancy complications. Mean age at first intercourse in SADHS[14] was similar to our study (18.5 years in SADHS vs 19.1 years in cardiac and 18.1 years hypertensive), however the SADHS did not investigate age at first contraception.

In a study conducted in Potchefstroom, South Africa, investigating contraception use and unintended pregnancy, Bafana found that the commonest reason for unintended pregnancy was discontinuation of contraception due to side-effects (33%).[39] In our study, 13% of cardiac and 18% of hypertensive women had unintended pregnancies after discontinuation of contraception due to side-effects.

We did not investigate further details about the unacceptable side-effects the women had experienced and which resulted in discontinuation of contraception and unintended pregnancies. In our study and SADHS, injectable progestogens have always been and still are the most common contraceptive method used by women. It is known that injectable progestogens often result in irregular bleeding and amenorrhoea which may not be acceptable to some women.

A multicentre study showed that a significant number of women preferred to have periods as reassurance of non-pregnant state and to "get rid of old blood".[50] in a South African study conducted in Limpopo Province, adolescent girls interviewed on barriers to access to contraception also reported that menstrual irregularities and amenorrhoea caused many of them to discontinue contraception. This was because absence of menstruation caused uncertainty about pregnancy status, and resulted in myths about "blood blockage" caused by contraception that resulted in multiple symptoms.[41]

Knowledge and use of some effective long-acting reversible contraceptives such as IUCD and IUS (Mirena) was limited. Our study showed no improvement in the knowledge of these contraceptive methods compared to a study conducted in Cape Town 6 years ago. In the prior study 46% of women (vs 32 % cardiac and 36 % hypertensive) had some knowledge of IUCD, and 2% (vs 1% cardiac and 0% hypertensive) had heard of IUS

(Mirena).[52] Only 4 women used IUCD and Mirena, which is unfortunate because of the missed benefit of avoiding side-effects experienced by injectable progestogen users. At the time of the study, Implanon had not yet been introduced to the public sector. Only 1 patient had heard of it.

In a country with a high burden of HIV, condom use, current and previous, was very low. This is concerning given the very dynamic educational programmes South Africa has invested in to reduce HIV transmission. Only 18 cardiac and 11 hypertensive women reported currently use a condom despite 69 cardiac and 57 hypertensive women mentioning it as contraceptive method they knew about. Five of 9 cardiac and 5 of 11 hypertensive women who were HIV positive did not currently use condoms. In the SADHS 2003 report, 70.9% of participants reported that they used condoms.[14]

The majority of women in our study belonged to Christian and Islamic religion. There was only one out of 200 women who had not used contraception and had unintended pregnancies because her religion prohibited contraception use. In a KAP (knowledge, attitude and practice) study of contraception in Pakistan, 65% of women interviewed believed that religion prohibited contraception use but many women knew about contraception and had used it at some point.[51]

The relatively high knowledge of contraceptive methods in both our surveyed groups (99%) was comparable to the finding of SADHS (94% of women).[14] Women over time have acquired some contraceptive knowledge. Lack of contraceptive knowledge at the time of conception was mentioned as a cause of unintended pregnancy by 33 cardiac and 9 hypertensive women. Only one patient who had previously had an unintended pregnancy could not mention a contraceptive method at the time of the interview.

Post-partum contraceptive uptake was reported to be high among the participants. It was surprising that some cardiac women with pre-existing cardiac disease reported that they were not offered any contraception following the pregnancies.

Despite the high knowledge, there were still 25 cardiac and 27 hypertensive women in our study who were not currently using any contraception and were therefore at risk of unplanned pregnancy. Some women who reported that they had been advised to consider tubal ligation had not agreed to the procedure. We did not investigate the reasons for not doing so. We also did not enquire about desire for fertility in the future.

In a study to assess attitude towards contraception in University of Natal, most students knew about contraceptive methods, but underestimated the effectiveness of contraception in preventing pregnancies, and did not believe that unprotected intercourse could result in pregnancy. Contraception use was associated with the stigma of promiscuity by the students.[42]In our study, we did not elicit any such stigma associated with contraception.

Complications of the medical conditions in both groups were better known than pregnancy complications secondary to their medical condition (n=62 cardiac n=82 hypertensive group vs n= 38 cardiac and n=55 hypertensive women). We did not enquire whether patients were given information regarding their medical conditions from the clinic and it is therefore not possible to conclude that their knowledge of medical complications was from information sharing with health care workers at their clinics.

Knowledge of pregnancy complications was not influenced by previous pregnancy complications. We would have expected that if patients had previous complications in a pregnancy, they would have been thoroughly counselled about their medical condition and implications of subsequent pregnancy. It raises great concern about the quality of

counselling these high risk women receive from the attending obstetricians and their retention of information.

Many patients mentioned that they had never been educated about contraception, reproductive health issues and their medical condition, and that there was insufficient information available regarding pregnancy and their medical conditions. A Canadian study that investigated contraception education given by medical doctors to women with congenital heart disease revealed that 50% (n=9) of women with WHO class 4 cardiac disease did not recall being advised against pregnancy despite documentation of such advice in their medical records.[53] The majority of women in our study were in contact with health care professionals at least once a year. Opportunities are available to re-enforce reproductive health education to these high risk women.

Patients overall felt that contraceptive services were readily available. There were no patients who received contraception from their medical clinics. Such clinics do not usually serve this purpose, and only 3 patients felt that they would be a convenient site to access contraception. It would theoretically be convenient for patients to get contraception and contraceptive advice on the same visit at their medical clinics, however it could be logistically challenging to set up such a service at the busy medical clinics.

Patients are not always satisfied with the advice from their care givers. A study conducted in Switzerland showed that 68.6% of women with hypertensive disorder of pregnancy were dissatisfied with medical information from their health care givers.[54] They reported to have not received any information (34.8%), suspected that the doctors had limited knowledge (24.6%) or were given incomplete information (15%). Perhaps health care workers need to find ways to improve information sharing with their patients. Many women suggested various methods of delivering information about reproductive health. Individual patients can be asked which method would best suit them.

CHAPTER 5:CONCLUSION

Medical conditions such as cardiac disease and hypertension can result in maternal and perinatal morbidity and mortality. These pregnancies require close surveillance and medical expertise. Contraception is key in reducing the burden of pregnancy complications from the medical conditions. The National Committee for Confidential Enquiry into Maternal Death (NCCEMD) recommends that all women with pre-existing medical conditions must be advised about contraception. Family planning services are widely available in the public healthcare sector, and offer a wide variety of contraceptive methods free of charge.

Our study showed that majority of women with cardiac disease and hypertension had unintended pregnancies. Knowledge of pregnancy complications from medical conditions was limited. Many women have never received reproductive health information from their medical clinics, and none of the women access contraception from these clinics.

Current contraception use was high but there was limited use of barrier methods including among those who were known to be HIV positive. There was also limited use of other effective contraceptive methods such as IUCD and Mirena.

The opportunity to discuss reproductive health issues with the high risk women is always available as many women attend their clinics at least once a year. Many women would like their physicians to discuss contraception and pregnancy during their visits to the clinic. They would also like to receive additional information in the form of reading material and group talks. Reproductive health education should be part of holistic care of women in general. It is the responsibility of all health care workers who consult with these high risk women to make an effort and provide them with reproductive health information, or refer them in order to enable them to make informed decisions regarding their health. This advice could save their lives.

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APPENDIX 1: HUMAN RESEARCH ETHICS COMMITTEE LETTRE OF APPROVAL

UNIVERSITY OF CAPE TOWN

Faculty of Health Sciences
Human Research Ethics Committee
Room E52-24 Groote Schuur Hospital Old Main Building
Observatory 7925
Telephone [021] 406 6338 • Facsimile [021] 406 6411
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17 January 2013

HREC REF: 565/2012

Dr N Givose
c/o Prof Z van der Spuy
Obstetrics & Gynaecology
H-Floor, OMB

Dear Dr Givose

PROJECT TITLE: REPRODUCTIVE AND CONTRACEPTIVE KNOWLEDGE AMONG WOMEN OF REPRODUCTIVE AGE WITH HYPERTENSIVE AND CARDIAC DISEASE

Thank you for responding to the issues raised by the Faculty of Health Sciences Human Research Ethics Committee in your letter received on 10th January 2013.

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

Approval is granted for one year till the 30th January 2014

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.
(Forms can be found on our website: www.health.uct.ac.za/research/humanethics/forms)

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please quote the HREC. REF in all your correspondence.

Yours sincerely

pp T Burgess

PROFESSOR M BLOCKMAN
CHAIRPERSON, FHS HUMAN ETHICS
Federal Wide Assurance Number: FWA00001637.

Institutional Review Board (IRB) number: IRB00001938
This serves to confirm that the University of Cape Town Human Research Ethics Committee complies to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical Research Council (MRC-SA), Food and Drug Administration (FDA-USA), International Convention on Harmonisation Good Clinical Practice (ICH GCP) and Declaration of Helsinki guidelines.
The Human Research Ethics Committee granting this approval is in compliance with the ICH Harmonised Tripartite Guidelines E6: Note for Guidance on Good Clinical Practice (CPMP/ICH/135/95) and FDA Code Federal Regulation Part 50, 56 and 312.

s.thomas

APPENDIX 2: QUESTIONNAIRE FOR CARDIAC PATIENTS

REPRODUCTIVE AND CONTRACEPTIVE KNOWLEDGE AMONG WOMEN WITH HYPERTENSIVE AND CARDIAC DISEASE

HREC Ref: 565/2012

QUESTIONNAIRE

CARDIAC PATIENTS

Patient Number: _____

Date of Interview: _____

Place of Interview: _____

Interviewer: _____

2012-12-10

BACKGROUND INFORMATION:

1. Date of Birth	
2. Age (in years and months)	
3. Population Group (1) Black South African (2) Coloured (3) White (4) Asian (5) Foreign African (please specify) _____ (6) Foreign Non- African (please specify)_____ (7) Other (please specify) _____	
4. Home Language (1) English (2) Afrikaans (3) Xhosa (4) French (5) Other (please specify) _____	
5. Language of Interview (1) English (2) Afrikaans (3) Xhosa	
6. Religion (1) Muslim (2) Protestant (3) Roman Catholic (4) Christian Other (please specify) _____ (5) Hindu (6) Jewish (7) Other (please specify) _____	

RELATIONSHIP STATUS AND SUPPORT

7. Marital Status (1) Single, not in a relationship (2) Single in a stable relationship but not cohabiting (3) Single and cohabiting (4) Married (5) Divorced (6) Separated (7) Widowed	
8. From whom do you receive **financial support**? (Mark all that apply) (1) Self (2) Partner/ Husband (3) Parent/s (4) Sibling/s (5) Other Relative/s (please specify) _____ (6) Friend/s (7) Disability Grant (8) Child Support Grant (9) No Financial Support (10) I don't know	
9. From whom do you receive **emotional support**? (Mark all that apply) (1) Partner/Husband (2) Parent/s (3) Sibling/s (4) Children (5) Other relatives (please specify) _____ (6) Friend/s (7) Other (please specify) _____ (8) No Emotional Support (9) I don't know	

SOCIO-ECONOMIC STATUS

10. Highest Level of Education (1) No formal schooling (2) Grade 1 (3) Grade 2 (4) Grade 3 (5) Grade 4 (6) Grade 5 (7) Grade 6 (8) Grade 7 (9) Grade 8 (10) Grade 9 (11) Grade 10 (12) Grade 11 (13) Grade 12 (14) Tertiary (incomplete) (15) Tertiary (complete) (16) Unknown	
11. Employment Status (1) Unemployed (2) Self Employed (3) Employed (Casual) (4) Employed (Formal) (5) Student/Scholar (6) Housewife (7) Disability or Other Grant (8) Other (please specify) _____	
12. What is your job? (1) N/A – unemployed (2) Housewife (3) Domestic Worker (4) Factory Worker (5) Office Worker (6) Professional (7) Other (please specify) _____ (8) Student/Scholar	
13. Type of Dwelling (1) Formal house on separate stand (2) Flat (3) Semi-detached house (4) Separate entrance (room in main dwelling) (5) Wendy house (room in backyard) (6) Informal Dwelling/Shack (7) Room in main dwelling (8) Homeless (9) Other (please specify) _____	
14. Do you own your own home? (1) YES (2) NO (3) N/A (4) Dependent Child	

(5) Unknown	

HABITS

15. Do you smoke cigarettes? (1) YES (2) NO, never (3) STOPPED less than 6 months ago (4) STOPPED more than 6 months ago	
16. If ***YES*** how many cigarettes a day? (1) 0 -10 (2) 10-20 (3) >20 (4) >30 (5) Other (please specify) _____ (6) N/A	
17. Do you consume alcohol? (1) YES (2) NO, never (3) STOPPED less than 6 months ago (4) STOPPED more than 6months ago (5) N/A	
18. If ***YES***, how many units/week? 1 unit of alcohol = 1 glass of wine, a nip or 1 shot of spirit, 1 glass of beer (~200mls) <1 = infrequent use) 99 if no alcohol	
19. Do you use any recreational drugs? (1) YES (2) NO, never (3) STOPPED less than 6 months ago (4) STOPPED more than 6 months ago	
20. If ***YES***, what drug do you use? (please list all) (1) TIK (2) Dagga (3) Opiates (4) Ecstasy (5) Mandrax (6) Other (please specify) _____ (7) Not Applicable	

OBSTETRIC HISTORY

21. Age of first coitus	
22. Age of first contraception	
23. Age of menarche	
24. Have you ever been pregnant? (1) Yes (2) No **If NO, proceed to Question 53 (ie. omit questions 25 – 52)**	
25. Gravidity	
26. Parity	
27. Miscarriages	
28. Ectopics	
29. TOPs	

Outcome of Each Pregnancies (please enter numbers)

30. Year	**31. Gest Age at end of preg.**	**32. Outcome of Pregnancy** 1.Miscarriage 2.Ectopic 3.Alive 4.SB 5.NND 6.TOP	**33. Baby Outcome** 1.Healthy 2.Physical Impairment 3. Mental Impairment 4.Subsequent Demise 5. N/A	**34. Mode of Delivery** 1.NVD 2.Forceps 3.Vacuum 4. C/S 5. N/A	**35.Contra-ception offered after pregnancy?** 1.YES 2.NO 3.Can't remember	**36.Birth Weight** 1. Weight 2. Don't know 3. N/A
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

37. What contraception were you offered after pregnancy? (Must volunteer, mark all that apply)
(1) Male condoms
(2) Female condoms
(3) Combined Oral Contraceptive Pill
(4) Progesterone Only Pills
(5) Injectable Contraceptives (progestagens)
(6) Intrauterine contraceptive Device
(7) Intrauterine system
(8) Sterilisation
(9) Other (please specify) _____
(10) N/A (not offered any method)
(11) N/A never been pregnant

38. What was the reason for the TOP?
(1) Maternal complications due to cardiac disease
(2) Maternal complications not related to cardiac disease
(3) Fetal complications/abnormality
(4) Socio-economic reasons
(5) Unintended pregnancy
(6) N/A (no previous TOP)

Maternal Complications during pregnancy

39. Pregnancies	**40. Extended periods in hospital because of heart disease** (1) Yes (2) No (3) Don't Know	**41. Admission to ICU due to heart disease** (1) Yes (2) No (3) Don't Know	**42. Acute Heart failure** (1) Yes (2) No (3) Don't know	**43. Arrhythmia** (1) Yes (2) No (3) Don't Know	**44. Pre-eclampsia-related complications** (1)Yes (2)No (3)Don't know	**45. Thrombo-embolic event** (1) Yes (2) No (3) Don't know	**45.(a) Haemorrhage** (1) Yes (2) No (3) Don't know		
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									

46. How many surviving children do you have? (give number)	
47. Were you diagnosed with cardiac disease for the first time in any pregnancy (including puerperium)? (1) Yes (2) No (3) I don't know (4) Already been diagnosed with cardiac disease before pregnancy (5) Diagnose after pregnancy	
48. If yes in 47, which pregnancy? –list all. (1) _____ (2) N/A	
49. If yes in 47, did your symptoms resolve after pregnancy? (1) Yes, returned to normal after all the pregnancies (2) Yes, returned to normal after some but not all the pregnancies (3) Never returned to normal (4) N/A (5) Don't Know	
50. Were all your pregnancies planned? (1) YES (2) NO (3) I can't remember/I don't know	
51. Were you using any form of contraception when you conceived? (1) YES (Specify which pregnancy)_____ (2) NO (3) I can't remember/I don't know (4) I have never been pregnant *(this applies to all pregnancies)*	
52. What was the reason if "No" in 51? (Must volunteer) (1) Planned Pregnancy (2) Did not think I could get pregnant because cardiac disease made it more difficult to conceive (3) Previously had not conceived despite not using any contraception (4) Previously not conceived despite fertility treatment (5) Hoping to fall pregnant although not actively planning it (6) I accidentally delayed getting my scheduled contraception (7) I stopped contraception because of side effects (8) Partner convinced me to stop contraceptive (9) Doctors asked me to stop contraception for medical reasons (10)Partner said he was sterile (11)Contraception difficult to access (12)I was sterilised (13)N/A I was on contraceptives (14)Other (Specify)_____	

MEDICAL HISTORY [ALSO FROM NOTES]

53. Is there anyone in your family with heart disease
    (1) Yes
    (2) No
    (3) I don't know

54. At what age were you first diagnosed with cardiac disease?

55. At what age were you started on treatment?

56. Current Treatment

	YES	NO	Don't Know
(1)Diuretics - e.g: Lasix			
(2) Beta blockers -e.g: Atenolol			
(3)Ace-inhibitors -e.g: Enalapril, Angiotensin Receptor blockers- e.g: Losartan			
(4)Calcium channel blockers - e.g: Verapamil, Amlodipine, Adalat XL			
(5)Anticoagulants -e.g: Warfarin			
(6)Antiplatelets- e.g: Aspirin			
(7)Anticholesterol - e.g: Statins			
(8) Antiarrythmics -e.g: Digoxin			
(9)Trinitrates for angina -e.g : Isordil			
(10)ARV's			
(11)Other-specify_____			

57. Do you have any other medical problems?
    (1)Yes
    (2) No
    (3) I do not know

58. If yes in 57, what illnesses do you have?
    (1) Hypertension
    (2) Diabetes
    (3) Stroke
    (4) Previous thrombo-embolic disease
    (5) Kidney disease
    (6) HIV
    (7) Other (specify)_____
    (8) I do not know
    (9) N/A no co-morbidities

59. Number of scheduled visits to cardiac disease clinic per year
    (1) 2 or less
    (2) 3 or more
    (3) Referred to Day Hospital or similar
    (4) First visit

59 (a). Nature of cardiac disease (from patient and folder)

DIAGNOSIS	YES	NO	NOT SPECIFIED
1.Cardiomyopathy			
2.Rheumatic Heart disease without valve replacement			
3.Rheumatic Heart disease with valve replacement			
4.Congenital Heart Disease			
5.Cardiac arrythmia			
6.Ischaemic Heart Disease			
7. Other cardiac surgery (specify)_____			
8.Other cardiac disease (specify)_____			
9. I don't know			

60. What complications have you been told can occur secondary to cardiac disease?
    (must volunteer, tick yes if mentions)

	YES
(1)Heart failure	
(2)Need for heart surgery	
(3)Infective endocarditis	
(4)Stroke	
(5)Heart attacks	
(6)Pregnancy could worsen the heart condition	
(7)Arrythmias	
(8)Other (please specify) _____	
(9) None volunteered	

61. Do you understand how cardiac disease can affect a pregnancy?
    (must volunteer, tick yes if mentions)

	YES
(1) Growth restriction	
(2) TOP because of worsening heart condition	
(3) Preterm birth	
(4) Congenital Abnormality	
(5) Stillborn	
(6)Caesarean Section	
(7)Haemorrhage from meds	
(8)Other (please specify)	
(9) None Volunteered	

62. Do you know if pregnancy affects cardiac disease in any way?
(must volunteer, tick yes if mentions)

	YES
(1)Worsens cardiac disease	
(2)Thrombo-embolism	
(3)Need to change medication	
(4)Need for emergency heart surgery and ICU care	
(5)Induce or worsen arrythmias	
(6)Other (please specify)	
(7)None volunteered	

63. Have you received any contraception/family planning/pregnancy planning/contraceptive advice at your cardiac clinic?
(1) YES
(2) NO
(3) I don't Know

64. Do you feel comfortable asking your cardiac doctor/sister for advice?
(1) YES
(2) NO
(3) I don't Know

65. If NO, why not?

(1)Clinic too busy	
(2)Doctor/Sister too rushed	
(3)Doctors and nurses have never initiated the topic	
(4)Shy/Uncomfortable to initiate topic with doctor/sister	
(5)Doctor/sister not interested	
(6)Did not think to ask anyone	
(7)Thought this "belonged" elsewhere in the service	
(8)N/A – Received advice/referral	
(9)Other (please specify)_____	

66. Who would you ask for contraceptive advice?

(1)Parents	
(2)Friends	
(3)Family doctor	
(4)Local Clinic Doctor/Sister	
(5)Other patients	
(6)Internet	
(7)Pharmacy	
(8)Partner	
(9)Family Planning Clinic	
(10)Other Relatives	
(11)Other (please specify)	
(12)Don't Know	

67. Would you like your cardiac doctor/sister to start the conversation about family planning/contraception? (1) YES (2) NO (3) Don't Know	
68. Do you find it easy to access contraception? (1) YES (2) NO (3) I don't know(never tried)	
69. Where do you usually get contraception? (1) Family planning clinic (2) Day hospital (3) Family doctor/GP (4) Diabetic Clinic (5) Pharmacy (6) Other hospital services (7) Other (please specify) _____ (8) Previous sterilisation (9) Don't use contraception	

70. Please list all the methods of family planning which you ***KNOW ABOUT***? [SPONTANEOUS INPUT]	
71. I will now ask you to list all methods you have ever ***USED.*** [SPONTANEOUS INPUT]	
72. Which method are you ***CURRENTLY USING***? [SPONTANEOUS INPUT]	

METHOD	**70. KNOW ABOUT**	**71. USED BEFORE**	**72. CURRENTLY USING**
a] Pill (COC)			
b] Mini pill (POP)			
c] Injection (Depo)			
d] Loop (IUCD)			
e] IUS (Mirena)			
f] Cap/Diaphragm			
g] Male condom			
h] Female Condom			
i] Long term implants			
j] ”Rhythm” method			
k] Withdrawal method			
l] Abstinence			
m] Spermicides			
n] Female sterilisation			
o] Male sterilisation			
p] Morning after pill			
q]Termination/abortion			
r] none of the above			
s] other (please specify)			
t] never used			

76. Have you been given a choice of family planning which was suitable for you? (1) YES (2) NO (3) I don't know (4) N/A	
77. Do you understand that some contraception will not be suitable for you because of your cardiac condition? (1) Yes (2) No (3) I do not know	
78. Do you feel information regarding contraception and cardiac disease is readily available to you? (1) YES (2) NO (3) I don't know	
79. Do you feel there is enough information regarding pregnancy and cardiac disease available to you? (1) YES (2) NO (3) I don't know	
80. Do you feel that the contraception services available to you are adequate and user friendly? (1) YES (2) NO (3) I don't know (4) N/A	
81. Would you value more information regarding contraception, reproductive and women's health specific to cardiac disease? (1) YES (2) NO (3) I don't know	
82. If YES, how or where would you like to receive this advice? (1) N/A (2) Booklet/Leaflet (3) Posters in clinic (4) Video/DVD/CD (5) Group talks (6) One on one with doctor/nurse (7) Family planning advisor/nurse who came to clinic (8) Family planning/Women's health clinic (9) Other (please specify)_____	

83. Do you think family planning services can be improved? (1) YES (2) NO (3) I don't know (4) N/A	
84. If ***YES***, in what way could services be improved? (List all that apply)(SPONTANEOUS INPUT) (1) N/A (2) Health care practitioners attitudes should change (3) Dedicated family planning clinics (4) Preconception care clinics (5) Family planning advice at your regular cardiac clinic (6) Women need contraceptive information/educational material (7) Shorter waiting times at family planning clinics (8) Longer or more suitable clinic hours (9) Private consultations (10)More accessible services (11)Specific advice about medical problems (12)Other (please specify _____ (13) Don't know	
85. Has any healthcare worker ever advised you to be sterilised in the past? (tubes tied) (1) YES (2) NO (3) I don't know (4) N/A- already sterilised	
86. Has any healthcare worker ever advised you against pregnancy in the past? (1) YES (2) NO (3) I don't know (4) N/A – already sterilised	

APPENDIX 3: HYPERTENSION QUESTIONNAIRE

REPRODUCTIVE AND CONTRACEPTIVE KNOWLEDGE AMONG WOMEN WITH HYPERTENSIVE AND CARDIAC DISEASE

HREC Ref: 565/2012

QUESTIONNAIRE

HYPERTENSIVE PATIENTS

Patient Number: _____

Date of Interview: _____

Place of Interview: _____

Interviewer: _____

BACKGROUND INFORMATION

30. Date of Birth	
31. Age (in years and months)	
32. Population Group (8) Black South African (9) Coloured (10)White (11)Asian (12)Foreign African (please specify) _____ (13)Foreign Non African (please specify)_____ (14)Other (please specify) _____	
33. Home Language (6) English (7) Afrikaans (8) Xhosa (9) French (10)Other (please specify) _____	
34. Language of Interview (4) English (5) Afrikaans (6) Xhosa	
35. Religion (8) Muslim (9) Protestant (10)Roman Catholic (11)Christian Other (please specify) _____ (12)Hindu (13)Jewish (14)Other (please specify) _____	

RELATIONSHIP STATUS AND SUPPORT

36. Marital Status (8) Single, not in a relationship (9) Single in a stable relationship but not cohabiting (10)Single and cohabiting (11)Married (12)Divorced (13)Separated (14)Widowed	
37. From whom do you receive **financial support**? (Mark all that apply) (11)Self (12)Partner/ Husband (13)Parent/s (14)Sibling/s (15)Other Relative/s (please specify) _____ (16)Friend/s (17)Disability Grant (18)Child Support Grant (19)No Financial Support (20) I don't know	
38. From whom do you receive **emotional support**? (Mark all that apply) (10)Partner/Husband (11)Parent/s (12)Sibling/s (13)Children (14)Other relatives (please specify) _____ (15)Friend/s (16)Other (please specify) _____ (17)No Emotional Support (18)I don't know	

SOCIO-ECONOMIC STATUS

39. Highest Level of Education (9) No formal schooling (10)Grade 1 (11)Grade 2 (12)Grade 3 (13)Grade 4 (14)Grade 5 (15)Grade 6 (16)Grade 7 (9) Grade 8 (10) Grade 9 (11) Grade 10 (12) Grade 11 (13) Grade 12 (14) Tertiary (incomplete) (15) Tertiary (complete) (16) Unknown	
40. Employment Status (9) Unemployed (10)Self Employed (11)Employed (Casual) (12)Employed (Formal) (13)Student/Scholar (14)Housewife (15)Disability or Other Grant (16)Other (please specify) _____	
41. What is your job? (9) N/A – unemployed (10)Housewife (11)Domestic Worker (12)Factory Worker (13)Office Worker (14)Professional (15)Other (please specify) _____ (16)Student/Scholar	
42. Type of Dwelling (10)Formal house on separate stand (11)Flat (12)Semi-detached house (13)Separate entrance (room in main dwelling) (14)Wendy house (room in backyard) (15)Informal Dwelling/Shack (16)Room in main dwelling (17)Homeless (18)Other (please specify) _____	
43. Do you own your own home? (6) YES (7) NO (8) N/A (9) Dependent Child (10)unknown	

HABITS

44. Do you smoke cigarettes? (5) YES (6) NO, never (7) STOPPED less than 6 months ago (8) STOPPED more than 6 months ago	
45. If ***YES*** how many cigarettes a day? (7) 0 -10 (8) 10-20 (9) >20 (10)>30 (11)Other (please specify) _____ (12)N/A	
46. Do you consume alcohol? (6) YES (7) NO, never (8) STOPPED less than 6 months ago (9) STOPPED more than 6months ago (10)N/A	
47. If ***YES***, how many units/week? 1 unit of alcohol = 1 glass of wine, a nip or 1 shot of spirit, 1 glass of beer (~200mls) <1 = infrequent use 99 if no alcohol	
48. Do you use any recreational drugs? (5) YES (6) NO, never (7) STOPPED less than 6 months ago (8) STOPPED more than 6 months ago	
49. If ***YES***, what drug do you use? (please list all) (8) TIK (9) Dagga (10)Opiates (11)Ecstasy (12)Mandrax (13)Other (please specify) _____ (14)Not Applicable	

OBSTETRIC HISTORY

50. Age of first coitus	
51. Age of first contraception	
52. Age of menarche	
53. Have you ever been pregnant? (3) Yes (4) No **If NO, proceed to Question 53(ie. omit questions 25 – 52)**	
54. Gravidity	
55. Parity	
56. Miscarriages	
57. Ectopics	
58. TOPs	

Outcome of Each Pregnancy (please enter numbers)

30. Year	**31. Gest Age at end of preg.**	**32. Outcome of Pregnancy** 1.Miscarriage 2.Ectopic 3.Alive 4.SB 5.NND 6.TOP	**33. Baby Outcome** 1.Healthy 2.Physical Impairment 3. Mental Impairment 4.Subsequent Demise 5. N/A	**34. Mode of Delivery** 1.NVD 2.Forceps 3.Vacuum 4. C/S 5. N/A	**35.Contra-ception offered after pregnancy?** 1.YES 2.NO 3.Can't remember	**36.Birth Weight** 1. Weight 2. Don't know 3. N/A
1.						
2.						
3.						
4.						
5.						
6.						

7.						
8.						
9.						
10.						

37. What contraception were you offered after pregnancy? (Must volunteer, mark all that apply)

(12)Male condoms
(13)Female condoms
(14)Combined Oral Contraceptive Pill
(15)Progesterone Only Pills
(16)Injectable Contraceptives (progestagens)
(17)Intrauterine contraceptive Device
(18)Intrauterine system
(19)Sterilisation
(20)Other (please specify) _____
(21) N/A (not offered any method)
(22) N/A never been pregnant

38. What was the reason for the TOP?

(1) Maternal complications due to hypertension
(2) Maternal complications not related to hypertension
(3) Fetal complications/abnormality
(4) Socio-economic reasons
(5) Unintended pregnancy
(6) N/A (no previous TOP)

Maternal Complications during pregnancy

39. Pregnancies	40. ICU admission because of hypertension (1) Yes (2) No (3)Don't Know	41. Extended hospital stay because of Hypertension and complications (1) Yes (2) No (3) Don't know	42. Abruptio placentae (1) Yes (2) No (3)Don't Know	43. Kidney failure/ dialysis (1)yes (2)No (3)don't know	44. Pre-eclampsia-related complications (1)Yes (2)No (3)Don't know	45. Other complications (specify) (1)Yes (2)No (3)Don't know		
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								

46. How many surviving children do you have? (give number)

47. Were you found to be hypertensive in any pregnancy (including the puerperium)?
    (6) Yes
    (7) No
    (8) I don't know
    (9) Already a diagnosed with hypertension before pregnancy
    (10) Diagnosed after pregnancy

48. If yes (in 47), which pregnancy?- list all
    (1) _____
    (2) N/A

49. If yes (in 47), did your blood pressure return to normal after pregnancy?
    (6) Yes, returned to normal after all the pregnancies
    (7) Yes, returned to normal after some but not all the pregnancies
    (8) Never returned to normal
    (9) N/A
    (10) Don't Know

50. Were all your pregnancies intended?
    (4) YES
    (5) NO

(6) I can't remember/I don't know	
51. Were you ever using any form of contraception when you conceived? (5) YES(Specify which pregnancy)_____ (6) NO (7) I can't remember/I don't know (8) N/A no previous pregnancies *(this applies to all pregnancies)*	
52. What was the reason if "No" in 51? (Must volunteer) (15)Planned Pregnancy (16)Did not think I could get pregnant because hypertension made it more difficult to conceive (17)Previously had not conceived despite not using any contraception (18)Previously not conceived despite fertility treatment (19)Hoping to fall pregnant although not actively planning it (20)I accidentally delayed getting my scheduled contraception (21)I stopped contraception because of side effects (22)Partner convinced me to stop contraceptive (23)Doctors asked me to stop contraception for medical reasons (24)Partner said he was sterile (25)Contraception difficult to access (26)I was sterilised (27)N/A I was on contraception (28)Other (Specify)_____	

MEDICAL HISTORY [ALSO FROM NOTES]

53. Is there anyone in your family with hypertension? (1) Yes (2) No (3) I don't know	
54. At what age were you first diagnosed with hypertension?	
55. At what age were you started on antihypertensive medication?	

56. Current Treatment

	YES	NO	Don't Know
(1)Diuretics- e.g: Lasix			
(2)Beta-blockers-e.g: Atenolol			
(3)Ace-inhibitors -e.g: Enalapril, Angiotensin Receptor blockers -e.g: Losartan			
(4)Calcium channel blockers-e.g: Verapamil, Amlodipine, Adalat XL			
(5)Antiplatelet meds- e.g: Aspirin			
(6)Anticoagulants- e.g: Warfarin			
(7)Anticholesterol-e.g: Statins			
(8)ARV's			
(9)Other (Specify)_____			

57. Do you have any other medical problems?
    (1)Yes
    (2)No
    (3) I don't know

58. If yes in 57, what illnesses do you have?
    (1) Cardiac disease
    (2) Diabetes
    (3) Stroke
    (4) Previous thrombo-embolic disease
    (5) Kidney disease
    (6) HIV
    (7) Other (specify)
    (8) I do not know
    (9) N/A no co-morbidities

59. Number of scheduled visits to hypertension clinic per year
    (5) 2 or less
    (6) 3 or more
    (7) Referred to Day Hospital or similar
    (8) First visit

60. What complications have you been told can occur as a result of hypertension? (must volunteer, tick yes if mentions)

	YES	NO
(1) Cardiac disease		
(2) Renal disease		
(3)Stroke		
(4) Retinopathy		
(5)Pregnancy complications		
(6)Malignant hypertension		
(7) None volunteered		
(8)Other (please specify)		

61. Do you understand how hypertension can affect a pregnancy? (must volunteer, tick yes if mentions)

	YES	NO
(1)growth restriction		
(2)Abruptio placentae		
(3)Pre-eclampsia		
(4)Miscarriage and TOP		
(5)Stillborn		
(6)Preterm birth		
(7)Caesarean Section		
(8)Others (specify)_____		
(9)None volunteered		

62. Do you know how pregnancy affects hypertension in any way? (must volunteer, tick yes if mentions)

	YES
(1)Can worsen hypertension	
(2)Can worsen kidney disease	
(3)Need to change medication	
(4)Need for ICU care	
(6)Other (please specify)_____	
(7)None volunteered	

63. Have you received any contraception/family planning/pregnancy planning/contraceptive advice at your hypertensive clinic?

(1) YES
(2) NO
(3) Don't know

64. Do you feel comfortable asking your hypertension doctor/sister for contraception advice?
    (4) YES
    (5) NO
    (6) Don't Know

65. If NO, why?

(1)Clinic too busy	
(2)Doctor/Sister too rushed	
(3)Sister/doctor has never initiated topic	
(4)Shy/Uncomfortable to initiate topic with doctor/sister	
(5)Doctor/sister not interested	
(6)Did not think to ask anyone	
(7)Thought this "belonged" elsewhere in the service	
(8)N/A – Received advice/referral	
(9)Other (please specify)	

66. Who would you ask for contraceptive advice?

(1)Parents	
(2)Friends	
(3)Family doctor	
(4)Local Clinic Doctor/Sister	
(5)Other patients	
(6)Internet	
(7)Pharmacy	
(8)Partner	
(9)Family Planning Clinic	
(10)Other Relatives	
(11)Other (please specify)	
(12)Don't Know	

67. Would you like your hypertension doctor/sister to start the conversation about family planning/contraception?
    (4) YES
    (5) NO
    (6) Don't Know

68. Do you find it easy to access contraception? (4) YES (5) NO (6) I don't know(never tried)	
69. Where do you usually get contraception? (10)Family planning clinic (11)Day hospital (12)Family doctor/GP (13)Hypertension Clinic (14)Pharmacy (15)Other hospital services (16)Other (please specify) _____ (17)Previous sterilisation (18)Don't use contraception	

70. Please list all the methods of family planning you ***KNOW ABOUT***? [SPONTANEOUS INPUT]	
71. I will then ask you to list all methods you have ***USED***. [SPONTANEOUS INPUT]	
72. And which method are you ***CURRENTLY USING***? [SPONTANEOUS INPUT]	

METHOD	**70. KNOW ABOUT**	**71. USED BEFORE**	**72. CURRENTLY USING**
a] Pill (COC)			
b] Mini pill (POP)			
c] Injection (Depo)			
d] Loop (IUCD)			
e] IUS (mirena)			
f] Cap/Diaphragm			
g] Male condom			
h] Female Condom			
i] Long term implants			
j] ”Rhythm” method			
k] Withdrawal method			
l] Abstinence			
m] Spermicides			
n] Female sterilisation			
o] Male sterilisation			
p] Morning after pill			
q]Termination/abortion			
r] None of the above			
s] Other (please specify)			

t] Never used			

73. Have you been given a choice of family planning which was suitable for you?
    (1)YES
    (2)NO
    (3)I don't know
    (4) N/A

74. Do you understand that some contraceptives will not be suitable for you because of hypertension? (1) Yes (2) No (3) I don't know	
75. Do you feel information regarding contraception and hypertension is readily available to you? (4) YES (5) NO (6) I don't know	
76. Do you feel there is enough information regarding pregnancy and hypertension available to you? (4) YES (5) NO (6) I don't know	
77. Do you feel that the contraception services available to you are adequate and user friendly? (5) YES (6) NO (7) I don't know (8) N/A	
78. Would you value more information regarding contraception, reproductive and women's health specific to hypertension? (4) YES (5) NO (6) I don't know	
79. If YES, how or where would you like to receive this advice?(SPONTANEOUS INPUT) (10)N/A (11)Booklet/Leaflet (12)Posters in clinic (13)Video/DVD/CD (14)Group talks (15)One on one with doctor/nurse	

(16)Family planning advisor/nurse who came to clinic (17)Family planning/Women's health clinic (18)Other (please specify) _____	
80. Do you think family planning services can be improved? (5) YES (6) NO (7) I don't know (8) N/A	
81. If ***YES***, in what way could services be improved? (List all that apply)(SPONTANEOUS INPUT) (14)N/A (15)Health care practitioners attitudes should change (16)Dedicated family planning clinics (17)Preconception care clinics (18)Family planning advice at routine hypertension follow up visits (19)Women need contraceptive information/educational material (20)Shorter waiting times at clinics (21)Longer or more suitable clinic hours (22)Private consultations (23)More accessible services (24)Specific advice about medical problems (25)Other (please specify) _____ (26)Don't know	
82. Has any healthcare worker ever advised you to be sterilised in the past? (tubes tied) (5) YES (6) NO (7) I don't know (8) N/A- already sterilised	
83. Has any healthcare worker ever advised you against pregnancy in the past? (4) YES (5) NO (6) I don't know (4) N/A – already sterilised	

APPENDIX 4: INFORMATION LEAFLET

INFORMATION LEAFLET

REPRODUCTIVE AND CONTRACEPTIVE KNOWLEDGE AMONG WOMEN WITH HYPERTENSIVE AND CARDIAC DISEASE REC NO……..

The Department of Obstetrics and Gynaecology of the University of Cape Town, with support from Head of the Department of Medicine, is doing a study at your clinic. It has been approved by the Research Ethics Committee at University of Cape Town. We think you are eligible for the study and wish to invite you to participate.

Reason for doing the study

Every year many women have complications during pregnancy in South Africa, and many of these are avoidable. Some women are at higher risk than others, for example women with chronic hypertension and cardiac disease. Pregnancies complicated by hypertension and cardiac disease are also associated with more complications for the baby, either because of the diagnosis itself or from some medication.

Often women fall pregnant unintentionally, and book late at the antenatal clinic. This is not ideal, especially for hypertensive and cardiac women. All this can be avoided or at least reduced by planning families, using effective modern contraception, and by ensuring that any medical condition is well controlled. It is recommended that cardiac and hypertensive women be counselled by the health care workers regularly when they attend their medical clinic, or be referred to family planning clinics for the advice and counselling.

The purpose of the study is to investigate the following:

1. Knowledge of contraception and pregnancy among hypertensive and cardiac women attending a clinic for management of their condition.
2. The information about pregnancy and contraception which is given to these women by the health care professionals.

Suitable patients for the study

1. Women between ages of 18 and 45
2. Known with chronic hypertension and/or any cardiac disease
3. Attending a routine medical clinic, and not in need of emergency medical care
4. Not currently pregnant

Patients not suitable for the study

1. Women younger than 18 and older than 45
2. Pregnant women
3. Women who do not wish to participate

The investigators are from the Reproductive Medicine Unit, and are employed by the University of Cape Town. They do not have any involvement with the management of your clinic. If you are

interested in participating, the investigators will interview you using a questionnaire. At times they may need to review your medical folder to confirm medical information. You will receive your usual routine medical care at the clinic, and none of your doctors are involved in the study. The questionnaire will take about twenty minutes to complete, and will not delay you at the clinic.

Risks anticipated

You will be completing a questionnaire with the help of trained interviewers, and there are no specific risks to you.

Benefits

The study may not benefit you directly in the short term. If you need immediate assistance about contraception, we will refer you to the appropriate department. In the long-term it will assist in improving reproductive health services provided to hypertensive and cardiac women. There will be no monetary gain for the participants or investigators.

Confidentiality

You will be interviewed privately. Your name and contact details will not be available when the data are analysed. We do need your name and signature for the consent form, which will not be attached to the questionnaire to ensure that there is no link between your answers and your identity. The questionnaires will be kept in a secure place, and will be property of the University of Cape Town.

The research results will be presented by the investigators to the Department of Obstetrics and Gynaecology at the University of Cape Town. The study will be submitted to the University of Cape Town for completion of a postgraduate degree.

The health care workers at your clinic will also have eventually access to the results of the study, but not your personal contribution, to help improve the services they provide to their patients.

Contact details

If you have any further queries regarding this study, please feel free to contact:

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If you wish to discuss this research with someone who is not involved in the study, you may contact: Dr M Patel, sub-specialist in Reproductive Medicine. Telephone: 021- 404 6026

Prof Marc Blockman, Chairman of Research Ethics Committee, Faculty of Health Sciences: Telephone: 021- 404 6492/Fax 021- 406 6411

APPENDIX 5: CONSENT FORM

CONSENT FORM

REPRODUCTIVE AND CONTRACEPTIVE KNOWLEDGE AMONG WOMEN WITH HYPERTENSIVE AND CARDIAC DISEASE

STUDY NUMBER: ……..

(REC NO……..)

I agree to participate in the study that is being conducted by researchers from Department of Obstetrics and Gynaecology. It has been approved by the Research Ethics Committee of the Faculty of Health Sciences.

The study has been fully explained to me in a language of my choice by a member of Reproductive Medicine Unit. I understand the purpose of the study is to investigate reproductive knowledge and practices of women with hypertension and cardiac disease, with the aim to improve reproductive health services for these women.

The results of the study will be submitted as part of a postgraduate degree to the University of Cape Town.

I understand I may withdraw from the study without compromising my medical care. There will be no payment made to me for participating

I will be interviewed in private, and my identity will be kept anonymous. I will complete a questionnaire with assistance from a member of the Reproductive Medicine Unit.

Name of participant	Signature of participant
…….	…….
Name of the researcher	Signature of researcher
……	…….
Name of witness	Signature of a witness
…….	……

Date……