MANAGEMENT OF PREECLAMPSIA/ECLAMPSIA IN DAR ES SALAAM PUBLIC HEALTH FACILITIES: AVAILABILITY OF SUPPLIES AND KNOWLEDGE OF HEALTHCARE WORKERS

By

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CERTIFICATION

The undersigned certify that he has read and hereby recommend for acceptance by the Muhimbili University of Health and Allied Sciences a dissertation entitled: **Management of preeclampsia/eclampsia in Dar es salaam public health facilities: availability of supplies and knowledge of healthcare workers,** in partial fulfillment of the requirements for the degree of Master of medicine in Obstetrics and Gynaecology of the Muhimbili University of Health and Allied Sciences.

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DEDICATION

This dissertation is dedicated to my beloved wife Grace and son LeRoy.

ABSTRACT

Background: Pre-eclampsia and eclampsia are the hypertensive disorders of pregnancy that affect 5-10% of all pregnancies. Eclampsia is associated with very high case fatality rate and a major contributor to maternal deaths. Early screening using simple tools and proper treatment of pre-eclampsia and eclampsia are important in reducing the maternal and neonatal morbidity and mortality.

Objective: To assess the availability of supplies and knowledge of healthcare workers in managing patients with preeclampsia/eclampsia in Dar-es-salaam public health facilities.

Methodology: This was a descriptive cross-sectional study involving 30 public health facilities in Dar es Salaam that offer reproductive and child services. Checklist was used to assess availability of instruments and drugs in the health facilities and, a structured questionnaire was used to assess knowledge of the healthcare workers. To assess knowledge of the healthcare workers, a score in the questionnaire of 8 - 17 marks was for adequate knowledge and a score less than 8 were for inadequate knowledge.

Results: All the public health facilities had working blood pressure machines and stethoscopes for blood pressure screening, less than half had dipsticks for detection of protein in urine. Availability of drugs for treating preeclampsia and eclampsia in the health facilities was low, less than half of had magnesium sulphate for controlling and prevention of seizures. Availability of antihypertensives was generally low only 40% of health facilities had methyldopa, 37% nifedipine and 17% hydrallazine. Availability of antihypertensives was lower in dispensaries compared to higher level facilities. Guidelines for managing patients with preeclampsia/eclampsia were available in 70% of all the health facilities. Primigravidity was the

most mentioned risk factor. Overall more than half of the healthcare workers had adequate knowledge in screening for risk factors, symptoms of severe preeclampsia and offer appropriate treatment.

Conclusion: The study has revealed that public health facilities lack essential supplies for screening and managing patients with preeclampsia and eclampsia. Availability of essential drugs for patients with preeclampsia/eclampsia is low in health facilities especially in the lower level of care. Majority of the healthcare workers have adequate knowledge to manage patients with preeclampsia and eclampsia.

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ABREVIATIONS

ACOG…… American Congress of Obstetricians and Gynecologists

ANC…….. Antenatal Clinic

BP…….Blood Pressure

DSM…… Dar-es-salaam

HF…… Health Facility

MgSo4……. Magnesium Sulphate

MNH……Muhimbili National Hospital

MOHSW……. Ministry of Health and Social Welfare

PIH…… Pregnancy Induced Hypertension

RCH…….. Reproductive and Child Health

SOGON…… Society of Gynecology and Obstetrics of Nigeria

UNICEF…… United Nations Children's Fund

WHO…….World Health Organization

CHAPTER ONE

1.0 INTRODUCTION

Hypertension is defined as a sustained systolic blood pressure higher than 140mmHg and/or diastolic pressure greater or equal to 90mmHg[1]. Hypertension can also be defined by elevation of systolic blood pressure by 30mmHg above the normal and/or 15mmHg of diastolic blood pressure above the normal. Preeclampsia is defined as a blood pressure of at least 140mmHg systolic pressure and 90mmHg diastolic pressure measured on two occasions 6 hours apart, accompanied by proteinuria of at least 300 mg per 24 hours, or at least 1+ on dipstick testing after 20 weeks[2].

Eclampsia refers to the onset of convulsions in a woman with preeclampsia that cannot be attributed to other causes. The seizures are generalized and may appear before, during, or after labor[3]. It's a serious manifestation that is associated with increased risk of mortality and morbidity in the pregnant women and poor perinatal outcomes.

The incidence of pre-eclampsia/eclampsia in hospital practice varies widely from 5-15%, in primigravidae is about 10% and in multigravidae 5%[1]. In developing countries, the incidence is expected to be higher; comparative low figures are reported in the hospital statistics due to inclusion of only severe degrees of the syndrome, the minor being ignored[4].

Etiology of hypertensive disorders of pregnancy remains unknown. Currently plausible potential causes include the following abnormal trophoblastic invasion of uterine vessels (in normal implantation uterine vessels undergo remodeling and invaded by endovascular trophoblasts), immunological intolerance between maternal and fetoplacental tissues, maternal maladaptation to cardiovascular or inflammatory changes of normal pregnancy, dietary deficiencies and genetic

influences[3]. The risk factors associated with pre-eclampsia/eclampsia include nulliparity, extremes of age (<20 and >35 years), essential hypertension, positive family history of hypertension, multiple pregnancies, low socio-economic status, history of previous pre-eclampsia, obesity[5].

The development of hypertension with proteinuria with or without edema, induced by pregnancy after the 20th week of gestation is a sign of pre-eclampsia. Severe preeclampsia manifests when one or more of the following are present, blood pressure of at least 160/110 mmHg measured on two occasions 6 hours apart, proteinuria of at least 5 g per 24 hours, or at least 3+ on dipstick testing, oliguria of less than 500 ml per 24 hours, cerebral or visual disturbances, pulmonary edema or cyanosis, Epigastric or right upper quadrant pain, impaired liver function, thrombocytopenia, or fetal growth restriction[6].

The definitive treatment of preeclampsia/eclampsia is delivery to prevent development of maternal or fetal complications from disease progression. Whether or not to deliver the fetus is based upon severity of pre-eclampsia, gestational age, maternal and fetal condition[7]. Patients at term are delivered, but preterm delivery is not always in the best interests of the fetus. In preterm pregnancy, aggressive management to deliver may result in high neonatal mortality while expectant management may be associated with maternal complications. Expectant management beyond 37 weeks offers no benefit to the mother and foetus, delivery is advised[8]. Women with pregnancy less than 28 weeks with severe pre-eclampsia should not be considered for expectant management and termination of pregnancy is recommended[9].

Conservative management of pre-eclampsia involves aggressive control of the raised blood pressure and prevention of the seizures. Commonly used antihypertensive are methyldopa,

nifedipine and hydrallazine. Others include clonidine, oxprenolol, and labetalol[10]. A study done in rural Tanzania by Urassa et al.[23] showed that, at the dispensary level these drugs are not available only to be available at the hospital level. National treatment guidelines places Aldomet in category A, that is to be available from the dispensary level. Nifedipine and hydrallazine are category C drugs, available in district hospitals. This could explain unavailability of the drugs in different levels of health facilities.

Anticonvulsants used for controlling/preventing seizures include magnesium sulphate the recommended first line drug, others include phenytoin and diazepam[11]. Many trials have been done to compare the efficacy of magnesium sulphate and other anticonvulsants, all have recommended magnesium sulphate as the standard regime for controlling and preventing seizures. There is reported support that magnesium sulphate reduces maternal death and maternal morbidity[12].

2.0 LITERATURE REVIEW

Pre-eclampsia and eclampsia are hypertensive disorders of pregnancy that cause significant morbidity and mortality in the fetus and mother both in the developed and developing countries. In 2002, there were over 4 million cases of pre-eclampsia and eclampsia globally, of which 63,000 resulted in a maternal death[13]. Pre-eclampsia and eclampsia remain one of the leading causes of maternal mortality and morbidity in the world. Globally, pre-eclampsia and eclampsia account for 10–15% of maternal deaths. The majority of maternal deaths in developing countries result from eclampsia, while in developed countries, complications of pre-eclampsia are more often the cause[12].

In the United States of America, pre-eclampsia/eclampsia are the third leading cause of maternal death accounting for 10% of all maternal death in 2004[14]. A study done in 2004 to assess the status of emergency obstetric care in the different zones of Nigeria by the Society of Gynecology and Obstetrics of Nigeria (SOGON) [38] revealed eclampsia as a major contributor to maternal mortality in the whole country. In Mozambique maternal deaths attributable to eclampsia are 7.3% and that in Zimbabwe is 6.9% of all the maternal deaths[15]. Another study done at a tertiary hospital in Dar-es-salaam, Tanzania, there were 460 maternal deaths in which eclampsia contributed 24% of all maternal death during the 6 years of the study, followed by postpartum hemorrhage and anaemia[16]. This is in contrast with other studies done in Sub-Saharan Africa which report postpartum hemorrhage being the number one cause of maternal mortality[17].

Estimates of case fatality rates, based mainly on hospital based studies, show that the risk of dying from eclampsia is approximately 14 times higher in a developing country compared to a developed country[18]. In 2008 a criteria-based audit on the management of eclampsia patients in a tertiary hospital in Dar-es-salaam, Tanzania, showed the case fatality rate for eclampsia to be

7.7%[19]. This was slightly higher compared to the study done in the same hospital by Urassa et al (2006) which found the case fatality rate to be 5%[20].

Severe pre-eclampsia and eclampsia contribute largely to perinatal morbidity and mortality. A study done by Gul et al.[21], perinatal mortality rate due to eclampsia was 24.4%. A similar finding was observed by Kidanto et al.[19] in a tertiary university teaching hospital in Tanzania which was 21.4%. Majority of these perinatal deaths are due to preterm delivery and low birth weight. This shows that eclampsia contributes a large proportion to perinatal deaths.

Early detection of the disorder is of prime importance so as to institute proper treatment to the pregnant women. However, diagnosing pre-eclampsia is not easy as the symptoms manifest late[4]. Initial signs and symptoms of the disease include hypertension, proteinuria, oedema and rapid weight gain. In severe pre-eclampsia symptoms include headache, blurring of vision, epigastric pain, cough with or without difficulty in breathing. Criteria for diagnosing pre-eclampsia include raised blood pressure 140/90mmHg or higher, proteinuria of more than 300mg in 24 hours urine [22].

Screening of pre-eclampsia/eclampsia requires simple tools like sphygmomanometer, stethoscope and albustix which are supposed to be available at all levels of care. In a retrospective study at MNH by Urassa et al[20] reported that screening for high blood pressure was 83% while that of proteinuria was 33%. This is a very low coverage for a tertiary hospital. Another study done in rural Tanzania revealed inadequate screening of hypertensive disorders of pregnancy; at the level of dispensary, nine out ten could measure blood pressure while one out of ten had albustix for checking proteinuria[23]. Another study done to assess quality of antenatal care in the United Republic of Tanzania showed 86% of public health facilities had blood pressure

machine, 100% had stethoscopes and 29% had uristix[24]. Lack of essential screening instruments in these facilities would lead to poor screening of pregnant women for preeclampsia.

The ultimate cure for pre-eclampsia and eclampsia is delivery of the baby[22]. However, maternal and perinatal deaths are significantly reduced with appropriate treatment. The aim of the treatment is to control the high blood pressure and prevent seizures. In controlling seizures, eclampsia collaborative group in 1995 produced compelling evidence in support of magnesium sulfate as the anticonvulsant of first choice both to control seizures and to prevent recurrence in eclampsia[10].

Magnesium sulfate is effective and inexpensive drug for the management of severe pre-eclampsia and eclampsia. In a systematic review involving more than 11,000 women, magnesium sulfate significantly reduced the risk of eclampsia among patients with severe pre-eclampsia than phenytoin and diazepam[25]. WHO estimates that use of magnesium sulphate can reduce deaths due to eclampsia by half[13]. There have been controversies as to whether to give only loading dose of magnesium sulphate alone or loading dose and maintenance dose. Systematic reviews have shown no significant difference in recurrence of seizures in those receiving loading dose alone and those receiving loading dose and maintenance dose[26].

There are principally two main regimens available for the administration of magnesium sulphate. The first is the Pritchard Regimen, in which the loading bolus dose of 4 grams of magnesium sulphate is given slowly intravenously over 5-10 minutes and this is followed by 10 grams given intramuscularly (5 grams in each buttock). Subsequently, 5 grams is given intramuscularly into alternate buttocks every 4 hours[27]. The second is the Zuspan regimen, in which the loading dose

consists of an initial intravenous dose of 4 grams slowly over 5-10 minutes followed by a maintenance dose of 1-2 grams every hour given continuously by an infusion pump[28].

Magnesium sulphate toxicity is manifested by loss of deep tendon reflexes, respiratory depression and cardiac arrest[29]. Detection of toxicity is mainly clinical, the parameters that need to be monitored are the knee jerk should be present, respiratory rate should be more than 16 breaths per minute, and urine output should be more than 25 millilitres per hour[30].

Despite of the effectiveness of magnesium sulphate in controlling seizures due to eclampsia but it is not used in all health facilities. A study done in Mexico and Thailand, in Mexico 36% of the hospitals used magnesium sulphate for preeclampsia and eclampsia[31]. The use of magnesium sulphate for the control and prevention of eclamptic fits is affected by several factors. The first is the healthcare workers and administrators who may be reluctant to adopt a new practice to use the drug as it requires intensive monitoring when used in eclampsia, the condition which is relatively infrequent in some places[32]. Secondly, in countries like Tanzania the drug is category C of the essential drug list, therefore it is not allowed to be dispensed in lower level health facilities – dispensaries and health centres[33], but clinical guidelines in the country indicates that the drug should be available in lower health facilities and administered as pre-referral treatment[37]. Moreover, the Tanzania National treatment guideline still recommends use of diazepam in controlling seizures in addition to magnesium sulphate, which may encourage healthcare workers to continue using diazepam instead of magnesium sulphate for prevention and treatment of eclampsia[33].

In a study done in Zambia to assess the barriers to the availability and use of magnesium sulphate revealed that, lack of stock, lack of licensing, low number of pre-eclampsia patients are the reasons for its unavailability in health facilities. The procurement system cause delay in the availability of this drug, this is especially so in the lower facility levels.This study revealed that lower levels of care were not supplied with the drugs because of lack of stock at the medical stores department[34].

Control of high blood pressure involve the use of pharmacological agents, treatment is aimed for a diastolic blood pressure less than 90 mm Hg and systolic blood pressure less than 140 mmHg. Methyldopa remains one of the most widely used drugs for the treatment of hypertension in pregnancy[35]. Other drugs are nifedipine and verapamil which are calcium channel antagonists[35]. Once blood pressure reaches 160mmHg systolic or 110mmHg diastolic, the woman is at increased risk of complications. Rapid control of high blood pressure involves intravenous labetalol and hydrallazine. At Muhimbili National hospital hydrallazine is commonly used, this is when diastolic blood pressure is greater or equal to 110mmHg. Hydrallazine selectively relaxes arteriolar smooth muscle by an as-yet-unknown mechanism[36].

The Tanzanian guidelines for the management of severe pre-eclampsia and eclampsia is planned according to the level of the facility[37]. At the primary level facilities including dispensary and health center, the management is to stabilize the patient by ensuring airways are patent, breathing is not compromised and the patient is haemodynamically stable. Controlling and prevention of further seizures is done by giving intramuscular injection of magnesium sulphate 10g, 5gm in each buttock. If the patient is in later stages of labour delivery should be conducted and then the patient is referred to hospital, otherwise the patient should be referred immediately. Giving loading dose of magnesium sulphate at primary level facility is crucial as it has been reported

that giving the drug earlier is associated with the reduction of maternal morbidity and mortality. In a Tanzania setting where patients delay reaching referral hospitals due to distance, poor infrastructure or difficulty in getting transportation[38], this is of paramount importance. The loading dose of magnesium sulphate has not been associated with toxicity.

Management of severe preeclampsia and eclampsia at hospital level involves admission of the patient, control and prevention of seizure by giving magnesium sulphate and lowering the blood pressure by using antihypertensives[37]. Termination of pregnancy is planned, if the patient develops other complications she is managed accordingly.

3.0 PROBLEM STATEMENT

Pre-eclampsia and eclampsia affects 5-10% of all the pregnancies and contributes to 10-15% of maternal deaths worldwide. Estimated case fatality rate due to eclampsia is 14 times higher in developing countries compared to developed countries[18]. The case fatality rate due to pre eclampsia/eclampsia at Muhimbili National Hospital is 5 - 7.7%[20, 19].

Screening of pre-eclampsia/eclampsia requires simple tools like sphygmomanometer, stethoscope and albustix which are supposed to be available at all levels of care. Studies done by Urassa et al in urban and rural Tanzania revealed inadequate screening of hypertensive disorders of pregnancy making early detection difficulty[23, 20]. Availability of these basic instruments at all levels of care together with knowledgeable health care workers play key role in managing patients with preeclampsia and eclampsia.

Studies showed also lack of drugs for treating patients with preeclampsia and eclampsia, one found no antihypertensives drug in primary health facilities and the other found no facility in Dar-es-salaam had methyldopa for controlling high blood pressure in pregnancy[23, 24].

Knowledge of the healthcare workers in screening and management of preeclampsia and eclampsiais crucial to reduce morbidity and mortality. There is paucity of information on the availability of equipments and supplies in the health care facilities and health care workers knowledge.

4.0 STUDY RATIONALE

Pre-eclampsia and eclampsia continues affect pregnant women approximately 10% and contribute 15% of maternal deaths. Management of pre-eclampsia and eclampsia requires skilled personnel, well established guidelines and premises equipped with the necessary instruments. This study aims to assess the availability of equipments, supplies and drugs for managing preeclampsia/eclampsia and knowledge of the health care workers on pre eclampsia/eclampsia. This study will unveil the situation of provision of care for women with pre-eclampsia and eclampsia in Dar es Salaam public health facilities and recommend areas of improvement so as to improve services to detect women with pre eclampsia early and offer proper treatment so as to reduce maternal mortality and morbidity associated with preeclampsia and eclampsia.

5.0 OBJECTIVES

5.1 Broad Objectives

To assess the availability of supplies and knowledge of healthcare workers in managing patients with preeclampsia/eclampsia in Dar es salaam public health facilities.

5.2 Specific Objectives

1. To determine the availability of equipments for the management of pre-eclampsia/eclampsia.
2. To determine the availability of drugs for the management of pre-eclampsia/eclampsia.
3. To determine the availability of guidelines for the management of pre-eclampsia/eclampsia.
4. To assess knowledge of the health care workers on the management of pre-eclampsia/eclampsia.

CHAPTER TWO

6.0 METHODOLOGY

6.1 STUDY DESIGN

This was a descriptive cross-sectional study.

6.2 STUDY AREA

The study was conducted in Dar-es-salaam the largest business city in Tanzania. The city is located along the coast of the Indian Ocean, in the East of the country. Though not recognized politically as the capital, the headquarters of the majority of the ministries and many other government and nongovernmental organizations as well as embassies are located in this city. It has three districts Kinondoni, Ilala and Temeke. In 2002, the city had a population of 3.5 million people with an annual growth rate of 4.3%.

In Dar es Salaam there are 419 health facilities, with 74.5% of them being privately owned. There are 31 hospitals, 27 health centres and 351 dispensaries. There are 6 public hospitals, five health centres and 96 dispensaries. Seventy six health facilities offer reproductive and child health services. Out of the public health facilities, there are 4 hospitals, 4 health centres and 68 dispensaries offering reproductive health services. As in many other countries, health centres and dispensaries in Tanzania are expected to provide basic emergency obstetric care while hospitals should provide comprehensive emergency obstetric care.

Staffs of dispensaries include mainly clinical officers, assistant medical officers and nurse midwife or nurse attendants, while in health centres there may be a medical doctors, assistant medical officers, clinical officers and nurse officer or nurse midwives. In the hospitals there are obstetricians, medical officers, assistant medical officers and at times the clinical officers. The nursing staff composed of nurse officers, nurse midwives and nurse attendants.

6.3 SAMPLE SIZE AND SAMPLING

To assess the quality of care in a setting, Kielman et al 1995 and UNICEF 1997 reported that a random sample of 25-30% of the health facilities in a district of an average size is adequate and feasible to represent a district health service situation. Out of 76 health facilities, 39% were included in this study. All the four public hospitals, three health centres and twenty three randomly selected dispensaries. At least seven dispensaries from each district were randomly selected and two more were randomly selected to make a total of 23 dispensaries.

The total of 138 healthcare workers were interviewed. These were obtained by including the healthcare workers available on the day of the visit to the health facility. In the dispensaries, at least two healthcare workers were interviewed and the number increased at the health centres and hospitals depending on the number available. In every facility visited at least one prescriber and one nurse were interviewed.

6.4 PRETESTING OF DATA COLLECTION

One research assistant was trained on the objectives of the study, methods of data collection using structured questionnaire and checklist were taught to the research assistant. Pretest was done at one dispensary not involved in the study. The principal investigator and research assistant interviewed healthcare workers using the questionnaire and the checklist was used to collect data on the availability of supplies. After data collection they discussed the research instruments and necessary corrections were made.

6.5 DATA COLLECTION

A checklist was used to collect the information on the availability of supplies. Supplies included equipments, drugs and guidelines. Equipments in the checklist included BP machine, stethoscopes, uristix, catheters, and patellar hammer. Drugs in the checklist included methyldopa, nifedipine, oxytocin, magnesium sulphate, diazepam, hydrallazine, calcium gluconate and misoprostol. In the checklist also included inquiry about availability of guidelines. Records were obtained from the health management information system and registry books designed to keep the records about the patients for the total number of antenatal attendees, deliveries and number of the patients with preeclampsia/eclampsia.

A structured questionnaire was used to obtain the information from the healthcare worker on the management of the patients with preeclampsia/eclampsia. Information obtained included work experience, training attended on preeclampsia/eclampsia, cadre, risk factors for preeclampsia, symptoms of preeclampsia, drugs for treating preeclampsia/eclampsia and drugs for control and prevention of fits.

On the day of data collection at a facility, an introduction letter was given to the facility in charge and purpose of the study explained. In each facility one checklist was filled, checklist was filled by cross-checking the mentioned drug whether available and not yet expired. Expired drugs and non functioning instruments were regarded as not available.

The research assistant and principal investigator administered the questionnaires. The questions with options the interviewer was not reading out the options but ticking those mentioned by the interviewee and if options for more responses were available the interviewee was given the chance to add more options

6.6 DATA ANALYSIS

Data entry was done using the EpiData version 3.1 then transferred to SPSS for analysis. Data cleaning was done by running frequencies and cross tabulations. To assess availability of the instruments and drugs, proportion of the health facilities with a particular instrument and drugs were tabulated and percentages obtained.

In assessing knowledge the main variables of interest were the risk factors, signs of preeclampsia, symptoms of severe preeclampsia, drugs for treating high blood pressure and drugs for controlling and preventing fits. For assessing knowledge on the risk factors variables were primigravidity, young age, advanced age, previous history of preeclampsia, twin pregnancy and others (chronic hypertension, change of partner, obesity). In assessing knowledge for the signs of preeclampsia hypertension ≥140/90mmHg, proteinuria, with/without oedema was the variable of interest. Symptoms of severe preeclampsia included severe headache, blurring of vision, epigastric pain and nausea/vomiting. In assessing drugs for treating high blood pressure methyldopa, nifedipine and hydrallazine were the variable of interest, and magnesium sulphate was the variable of choice for drug used to control and prevent fits. There was a total score of 17 marks on the questionnaire, those with score less than 8 were considered as having inadequate knowledge and a score of 8 and above was considered as having adequate knowledge.

Healthcare workers were grouped into three for convenience, nurses who included nurse midwives and nurse officers. Prescribers were in two groups clinical officers and doctors (assistant medical officers and medical officers).

6.7 ETHICAL CONSIDERATION

Ethical clearance was sought from the Muhimbili University of Health and Allied Science Research and Publication committee. Permission to conduct the study was sought from the municipal medical officer of the three districts. Health facility administration was approached and explained the purpose of the study so as to allow data collection and interview health care workers.

Informed consent was obtained from the healthcare workers after explaining to the participants the objectives of the study and that all the information provided is confidential. Participants were ensured that data collected will be used for research only and were free at anytime during interview to withdraw from the study.

6.8 LIMITATIONS

The following the limitations of the study;

Poor record keeping in the health facilities, records were not easily obtained as there was no single person assigned to this duty. Some healthcare workers were reluctant to be interviewed for fear that the information could be used against them, we had to explain to them and even involve the hospital incharge.

CHAPTER THREE

7.0 RESULTS

A total of 30 public health facilities were visited in this study. There were 508 healthcare workers working in the maternity units, 138 healthcare workers were interviewed.

Table 1. Distribution of healthcare workers interviewed

Characteristic	**N= 138**	**Percentage**
Age(Years)		
20 - 30	*22*	16
31 - 40	*84*	61
>40	*32*	23
Cadre		
Nurses	84	62
Clinical officers	17	12
Doctors	37	26
Health Facility Level		
Hospital	61	45
Health centre	15	11
Dispensary	62	44
Work Experience(Months)		
1 – 23	17	12
24 – 60	77	56
>60	44	32
Trained on Preeclampsia/eclampsia	47	34

Table 1 show that nearly two third of the healthcare workers were between 31-40 years and majority were nurses. Almost half of the healthcare workers were from the hospitals.

Table2. Antenatal care attendees, deliveries and referrals of women in the health facilities

	Hospitals		**Health Centres**		**Dispensary**		**Total**
	n	%	n	%	n	%	N
ANC attendance	23386	26	17648	20	48680	54	89714
Deliveries	73406	81	6762	8	9886	11	90054
Delivered with Preeclampsia	2267	88	89	3	222	9	2578
Delivered with Eclampsia	748	99	0	0	10	1	758

Table 2 shows that more than half of antenatal care visits are done in the dispensaries. Majority of the deliveries of women with preeclampsia or eclampsia took place in the hospitals.

Table 3. Proportion of health facilities with instruments, supplies and drugs for management of preeclampsia/eclampsia.

Equipment/Drug	**Hospitals (N=4)**		**Health Centres (N=3)**		**Dispensaries (N=23)**		**Total (N=30)**	
	n	%	n	%	n	%	n	%
Equipment								
BP machine	4	100	3	100	23	100	30	100
Stethoscope	4	100	3	100	23	100	30	100
Dipsticks	1	25	3	100	9	39	13	43
Urinary catheters	4	100	3	100	15	65	22	73
Urinary bags	4	100	3	100	23	100	30	100
Patellar hammer	1	25	0	0	0	0	1	3
Guideline	4	100	3	100	14	61	21	70
Drugs								
Magnesium sulphate	4	100	3	100	6	26	13	43
Diazepam	3	75	3	100	22	96	28	93
Methyldopa	3	75	3	100	6	26	12	40
Nifedipine	3	75	3	100	5	22	11	37
Hydrallazine	2	50	1	33	2	9	5	17
Oxytocin	4	100	3	100	23	100	30	100
Misoprostol	2	50	3	100	18	100	23	77
Calcium gluconate	1	25	1	33	0	0	2	7

All the health facilities had working BP machines and stethoscopes. Dipsticks for detecting proteinuria were available in 43% of health facilities. Less than half 43% had magnesium

sulphate. Methyldopa was available in 40% of health facilities. The availability of supplies in the health centres and hospitals is almost the same and higher than the dispensaries.

Table 4. Proportion of healthcare workers with knowledge of the risk factors and symptoms of preeclampsia

Risk Factors	**Nurses (N=84)**		**Clinical Officers (N=17)**		**Doctors (N=37)**		**Total (N=138)**	
	n	%	n	%	N	%	n	%
Primigravidity	72	86	12	70	34	91	118	86
Young age	32	38	6	35	23	62	61	44
Advanced age	16	19	2	12	14	38	32	23
Previous history of preeclampsia/eclampsia	36	43	3	18	35	95	74	54
Twining	51	61	13	76	32	86	96	70
Others*	41	49	6	35	18	49	65	47
Symptoms								
Severe headache	75	89	14	82	36	97	125	91
Epigastric pain	48	57	7	41	34	92	89	64
Blurring of vision	64	76	10	59	35	95	109	79
Nausea/vomiting	4	5	0	0	13	35	17	12

*include chronic hypertension, change of partner, obesity

Eighty six percent of healthcare workers mentioned primigravidity as the risk factor for preeclampsia, 91% were the doctors. Advanced age was mentioned by 23% of healthcare workers. The symptoms of severe preeclampsia that was most mentioned was severe headache 91%. Very few health care workers recognized nausea and vomiting as a symptom of severe preeclampsia only 12% of healthcare workers reported this.

Table 5. Proportion of healthcare workers with knowledge on the antihypertensives and anticonvulsants in managing preeclampsia/eclampsia.

Drug	**Nurse (N=84)**		**Clinical Officer (N=17)**		**Doctors (N=37)**		**Total (N=138)**	
	n	%	N	%	N	%	n	%
Antihypertensives								
Methyldopa	84	100	15	88	37	100	136	99
Nifedipine	66	79	10	59	35	95	111	80
Hydrallazine	18	21	1	6	21	57	40	29
Anticonvulsants								
Magnesium sulphate	82	98	12	71	37	100	131	95
Diazepam	49	58	12	71	26	70	87	63

Almost all healthcare workers 99% knew methyldopa is the drug used to control raised blood pressure and 29% would use hydrallazine to control blood pressure. To control and prevent eclampsia, 95% of healthcare workers would give magnesium sulphate.

Table 6. Overall proportions of healthcare workers with knowledge in managing patients with preeclampsia/eclampsia.

Characteristic	Total Knowledge				Total
	Adequate (N=76)		Inadequate (N=62)		(N=138)
	n	%	n	%	N
Age (Years)					
20 - 30	12	55	10	45	22
31 - 40	51	61	33	39	84
>= 41	13	41	19	59	32
Cadre					
Nurses	38	45	46	55	84
Clinical Officers	7	41	10	59	17
Doctors	31	84	6	16	37
Level of Facility					
Dispensary	24	39	38	61	62
Health Centre	14	93	1	7	15
Hospital	38	62	23	38	61
Working Experience (months)					
1 – 23	7	41	10	59	17
24 - 60	43	56	34	44	77
>= 61	26	59	18	41	44
Training in preeclampsia/eclampsia					
Yes	36	77	11	23	47
No	40	44	51	56	91

Table 6 shows that more than half 64% of healthcare workers had adequate knowledge in managing patients with preeclampsia and eclampsia. Among the doctors, 84% had adequate knowledge. Those who had training 77% had adequate knowledge.

CHAPTER FOUR

8.0 DISCUSSION

The study has revealed that more than half of the pregnant women attend ANC at the lower level of care, while most of the deliveries take place in hospitals. All the pregnant women with eclampsia were delivered in the hospitals. Almost all deliveries of women with eclampsia occurred in the hospital because lower levels refer complicated cases to higher levels of care where specialized care can be given. This means at lower levels screening should be more for those with risk and follow up for the development of the disease. Guidelines were available in more than two thirds of health facilities, the guidelines found in the health facility included mainly basic emergency obstetric and neonatal care (BeMONC), others are emergency obstetric care job aid and national treatment guideline.

This study revealed that all health facilities had blood pressure machine and stethoscope which would be used to screen and to monitor blood pressure during antenatal care. This implies that at least all the antenatal attendees may have an opportunity to be screened for raised blood pressure. This is slightly higher than that found in a study done in Rufiji, in which only 87% of health facility had working blood pressure machines and stethoscopes[23]. This could be explained by the fact this study was done in urban settings, also the study was done in 2003.

Dipsticks for detection of proteinuria were available in less than half of health facilities. Ruling out proteinuria is important for making a diagnosis of pre-eclampsia. Detection of proteinuria above the threshold in a pregnant woman with hypertension differentiates between gestational hypertension and pre-eclampsia and dictates a considerable step-up in surveillance, often including admission. This is slightly higher than in the study that was conducted in Dar-es-

salaam public hospitals, in which only a third had uristix[24]. A similar finding to this study was observed in Rufiji where less than half of the health facilities had dipsticks, with dispensaries being the most affected[23]. All levels of care must have these screening instruments especially the dispensaries where more than half of the antenatal visits of pregnant women are observed. Failure to rule out proteinuria and preeclampsia would lead to under treatment of the patients and delay in referring women with the disease to higher level of care for further management.

Magnesium sulphate was available in less than half of the health facilities. Dispensaries were more affected than all other levels of care. This may delay the patients with preeclampsia and eclampsia not to receive the first dose of magnesium sulphate which is very important in saving lives in these patients. Fear of magnesium sulphate toxicity and monitoring for toxicity make it not widely utilized in lower levels where there are no adequate gadgets for monitoring. Another explanation could be the fact that dispensaries do not have big number of patients with preeclampsia/eclampsia hence low usage of the drug and the available may overstay till its expiry date hence no stocks of magnesium sulphate. Diazepam was available in 93% of health a similar finding was observed in Mexico and Thailand[31]. In Mexico only 36% of the hospitals had magnesium sulphate and its usage was very low usage rate 0.8% to 8.5%. In this study almost all healthcare workers would use magnesium sulphate to manage preeclampsia and eclampsia.

Antihypertensive dugs were not available in more than half of the health facilities. In the dispensaries more than three quarters had no methyldopa and nifedipine, while in the hospitals and health centres more than three quarters had methyldopa and nifedipine. All health centres had all the antihypertensives compared to hospitals and dispensaries. This means women

diagnosed with preeclampsia in a facility where antihypertensives are not available will have delay in initiating treatment until when referred to a facility or failure to go to a referral facility the woman may be in danger for more complications. A similar finding was observed in Rufiji where only 13% of the facilities had antihypertensive drugs, only hospitals had antihypertensives and in a study done in Dar es salaam public health facilities had no methyldopa[23, 24].

Availability of drugs and instruments in the health centres and the hospitals were almost in equal levels. This could be the reflection of the true or chance variation. This could also be due to large number of patients with preeclampsia and eclampsia being managed in hospitals than health centres, hence more utilization of these supplies in the hospitals. This was different from the study that was done in Zambia and rural Tanzania which found that lower level facility had low availability of supplies compared to hospitals[23, 34].

Primigravidity as a risk factor was mentioned by majority of the healthcare workers as a risk factor, the least mentioned risk factor was advanced age. More than half of the doctors mentioned all the risk factors. Doctors are more learned cadre in this study, so we would expect them to identify more risk factors. A study on risk factors showed that the most common risk factor being primigravidity, multigravidity and previous history of preeclampsia/eclampsia[5]. This is to say, healthcare workers should screen all the pregnant women for the disease as risk factors have lower predictive value. In those facilities with screening tests all women must be screened for preeclampsia as early as possible.

Knowledge of the healthcare workers on the symptoms of severe preeclampsia revealed that severe headache is the most known symptom among healthcare workers and the least known symptom was nausea and vomiting. Nausea and vomiting was least mentioned, this could be due to association of nausea and vomiting with even the normal pregnancy. More than half of the

interviewed health cadres were able to mention at least three important symptoms of severe preeclampsia. This gives hope that healthcare workers will identify women with severe preeclampsia early and provide appropriate treatment. This would also mean that in those centres where they cannot manage severe preeclampsia would refer these patients much earlier to higher level of care for further management.

On the overall two thirds of the healthcare workers had adequate knowledge. Doctors appeared to have adequate knowledge than other cadres, this could be due to the fact that doctors are the more learned cadre. Those who received training more than three quarters had adequate knowledge. This reflects that with training of healthcare workers, improve their knowledge. Short courses and continuous medical education can play vital role in improving knowledge of the healthcare workers of women thus improve care of women with preeclampsia/eclampsia.

9.0 CONCLUSION

The study has revealed that public health facilities lack essential supplies for screening and managing patients with preeclampsia and eclampsia. Availability of essential drugs for patients with preeclampsia/eclampsia is low in health facilities especially in the lower level of care. Majority of the healthcare workers have adequate knowledge to manage patients with preeclampsia and eclampsia.

10.0 RECOMMENDATIONS

There should be increased availability of the dipsticks to all the facilities that offer reproductive services. Anticonvulsants and antihypertensives should be made available to all the health facilities that offer reproductive health services. Guidelines are to be made available in all the health facilities as these recommend standard treatment to patients. Knowledge of healthcare workers has to go hand in hand with the availability of essential supplies to screen and manage patients with preeclampsia and eclampsia to reduce maternal morbidity and mortality. Continuing medical education should be offered to healthcare workers to improve detection and treatment of cases of preeclampsia and eclampsia. Observational study to assess healthcare workers management of cases of preeclampsia/eclampsia is recommended.

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12.0 APPENDICES

Checklist

Name of HF……..

Level of HF 1) Dispensary 2) Health center 3) Hospital

Human resource ……

i. Specialist…….
ii. Medical doctor……
iii. Assistant medical officer…….
iv. Clinical Officer……
v. Nurses……..

I. Availability of the supplies/equipments for the management of Pre-eclampsia/Eclampsia

Item	Yes	No	If No for how long
Guidelines			
BP machine			
Stethoscope			
Fetoscope			
Ambu bag			
Oxygen cylinders/Concentrators			
Patellar hammer			
Urinary catheters(Foley catheter)			

Urinary bags			
Drip stands			
Syringes (10cc/20cc)			
Uristix			
Cannula			
Intravenous giving set			
Sharp boxes for waste disposal			

Specify type of guideline……..

Availability of drugs for the management of pre-eclampsia and eclampsia

Drug	Available	Not Available	If Not available for how long
Magnesium sulphate			
Diazepam			
Phenytoin			
Calcium gluconate 10%			
Hydrallazine			
Dexamethasone			
Aldomet			
Nifedipine			
Oxytocin			
Promethazine			
Chlopromazine			

Misoprostol			
Intravenous fluids			

Assessment of the workload for the past one year

Total Number of ANC attendance	Total Number of Deliveries	Number of Patients with Raised BP	Number of Patients with Eclampsia	Number of Patients Referred with Raised BP/Eclampsia	

Questionnaire- English version **Sn: ……**

Name of the interviewer……

Name of facility……..

Facility level 1. Dispensary

2. Health center

3. Hospital

NB: Don't read the options during the interview.

1. What is your name …….. (optional)
2. What is your cadre a)Nurse midwife
   b) Nurse Officer
   c) Clinical officer
   d) Assistant Medical Officer
   e) Medical Doctor
   f) Specialist (Obs/Gyn)
3. How old are you……..?
4. Your gender a) Female b) Male
5. When were you employed……?
6. For how long have you worked in the maternity unit……
7. Have you attended a training on pre-eclampsia/eclampsia?
   a) Yes
   b) No

8. What is pre-eclampsia/eclampsia?

    a) Gestation age >/= 20wks

    b) Hypertension (140/90mmHg)

    c) Proteinuria (3+ or 300gm)

    d) Oedema

9. What are the risk factors for developing pre-eclampsia?

    a) Primigravidity

    b) Young age

    c) Advanced age

    d) Previous history of pre-eclampsia/eclampsia

    e) Obesity

    f) Twin pregnancy

    g) Others (specify)…….

10. A pregnant woman with pre-eclampsia presents with which symptoms?

    a) Severe headache

    b) Nausea and/or vomiting

    d) Epigastric pain

    e) Blurring of vision

    f) Lower limb swelling

    g) Others (specify)…….

11. What are the screening tests routinely done?

    a) Blood pressure measurement

    b) Urine analysis (Protein detection/qty)

c) Others (Specify)……..

d) Do not know

12. Which drugs are used for treatment of high blood pressure in pregnancy?

a) Aldomet

b) Nifedipine

c) Hydrallazine

d) Labetalol

e) Others (specify)…….

13. What drugs are used for rapid control of blood pressure?

a) Hydrallazine

b) Labetalol

c) Sub-lingual nifedipine

d) Others (Specify)……

14. What is eclampsia?.....

15. Which drugs are used for the control of fits?

a) Magnesium sulphate

b) Diazepam

c) Phenytoin

d) Phenobarbitone

e) Lytic cocktail

f) Others (Specify) …….

16. Which drug(s) is the recommended for the control of fits?

a) Magnesium sulphate

b) Others (Specify)……

17. What is the loading dose of Inj. Magnesium sulphate?

a) 4gm intravenously

b) 10gm intramuscularly (5gm each buttock)

18. Specify maintenance dose of magnesium sulphate?

a) Intravenous route 4gm/4hourly

b) Intramuscular route 5gm/4hourly alternate buttock

19. What are the signs of magnesium sulphate toxicity?

a) Respiratory depression

b) Loss of deep tendon reflexes(patellar reflexes

c) Others (Specify)……

d) Do not know

20. What is the antidote for Magnesium sulphate toxicity?.....

a) Calcium gluconate

b) Others (Specify)……

c) Do not know

21. Availability of Magnesium sulphate?

a) Readily available in the ward

b) patient buys

c) Not available

22. When will you deliver a woman with eclampsia (from the onset of fits)?.....

23. Prior referring the patients with preeclampsia/eclampsia which antihypertensives do you give

    a) Aldomet
    b) Nifedipine
    c) Others (specify)…….
    d) Do not know

24. Prior referring patients which anticonvulsants do you to a patient with severe preeclampsia/eclampsia?

    a) Magnesium sulphate
    b) Others(specify)
    c) Do not know

Consent Form – English Version

Hello, my name is ……, from the Muhimbili University of Health and Allied Sciences carrying out a research on 'The Assessment of the capacity of Dar es salaam health facilities in providing care for the patients with preeclampsia and eclampsia'

The aim of the study is to assess the availability of the essential equipments and drugs for the management of pre-eclampsia and eclampsia. I also assess the knowledge of health care workers in managing pre-eclampsia and eclampsia.

At the end we will be able unveil the situation of provision of care for women with pre-eclampsia and eclampsia and offer recommendations so as to improve the care and reduce morbidity and mortality associated with pre-eclampsia/eclampsia.

All the information gathered will be strictly confidential and used for research purposes only. In case of any concerns about the study, feel free to contact Prof Abood, the chairperson of the Research and Publication Committee at Muhimbili University of Health and Allied Sciences (Tel :2150302); P. O. Box 65001, Dar-es-salaam.

I therefore ask for your participation in this study for filling this questionnaire, thanks.

I agree/ don't agree ……. (Name)

…… (Signature)

Questionnaire – Swahili Version **Namba…….**

Jina la mhoji ……..

Jina la kituo cha afya …….

Ngazi/Daraja la kituo

a)zahanati

b)Kituo cha afya

c)Hospitali

1)Jina lako nani?

2) Wadhifa/elimu yako

a) Mkunga

b) Muuguzi

c) Tabibu

d) Daktari msaidizi

e) Daktari

f) Daktari bingwa

3) Una umri gani……..?

4) Jinsia yako 1) mke 2) mme

5) Umefanya kazi kama mhudumu wa afya kwa muda gani?

6) Umefanya kazi katika kitengo cha uzazi na afya ya kina mama kwa muda gani?

7) Umeshawahi kupata mafunzo yoyote kuhusu shinikizo la damu wakati wa ujauzito na kifafa cha mimba?

a)Ndiyo

b)hapana

8) Nini maana ya shinikizo la damu wakati wa ujauzito?

a) Mkandamizo wa damu mkubwa (140/90mmHg)

b) Kuwepo kwa protini ktk mkojo (300gm or 3+)

c) Umri wa mimba zaidi ya wiki 20

d) Kuvimba miguu

9) Vitu gani vinaweza kumuweka mama katika hatari ya kupata shinikizo la damu wa ujauzito/kifafa cha mimba

a) Ujauzito wa kwanza

b) Umri mdogo wakati wa ujauzito

c) Umri mkubwa wakati wa ujauzito

d) Shinikizo la damu katika ujauzito uliotangulia

e) Unene kupita kiasi

f) Mimba za mapacha

g) Nyinginezo……

10) Mama mjamzito mwenye shinikizo la damu wakati wa ujauzito huwa na dalili gani?

a) Maumivu ya kichwa

b) Kichefuchefu au/na kutapika

c) Kutokuona vizuri (kuona giza)

d) Kupungua kwa wingi wa mkojo

e) Kuvimba miguu

f) Dalili nyingine…….

11) Vipimo gani hufanywa katika kliniki kuchunguza mama mjamzito kama ana shinikizo la damu?

a)Upimaji wa shinikizo la damu

b) Uchunguzi wa mkojo kuangalia protini

c) Kingine…….. (taja)

12) Dawa gani hutumika kutibu shinikizo la damu wakati wa ujauzito?

a) Aldomet

b) Nifedipine

c) Hydralazine

d) Labetalol

f) Nyingine

13) Ni dawa zipi hutumika kushusha shinikizo la damu haraka kwa mtu mwenye shinikizo la damu wakati wa ujauzito na kifafa cha mimba?

a) Hydrallazine

b) Labetalol

c) Sub lingual nifedipine

d) Nyingine(taja)……..

14) Kifafa cha mimba ni nini?.....

15) Dawa gani hutumika kutibu kifafa cha mimba?

a) Magnesia ya salpheti

b) Diazepam

c) Phenytoin

d) Phenobarbitone

e) Lytic cocktail

f) Others

16) Dawa gani zinashauriwa kutumika kudhibiti kifafa cha mimba?

a) Magnesia ya salpheti

b) Nyingine taja

17) Ni kiasi gani cha magnesia ya salfeti hutolewa kama dozi ya kwanza?

a) 4 gramu kwa mishipa ya damu

b) 10 gramu(5gramu kila kalio)

c) Sijui

18) Muendelezo wa dozi za magnesia ya salfeti hutolewa kwa njia gani?

a) 4 gramu kupitia mishipa ya damu kila baada ya masaa 4

b) 5 gramu kwenye misuli ya makalio kila baada ya masaa 4

c) sijui

19) Nini dalili ya sumu ya magnesia ya salfeti?

b) Kushindwa kupumua

c) Kupotea kwa hisia za misuli

d) Nyingine

20) Dawa gani hutumika kwa mgonjwa mwenye sumu ya magnesia ya salfeti

a) Kalisiumu ya glukoneti

b) Nyingine(taja)……..

c) Sijui

21) upatikanaji wa magnesia ya salfeti hapa kituoni upoje..

a) Hupatikana kwa urahisi wodini

b) Mgonjwa hununua

c) Hazipatikani

22) Mgonjwa mwenye kifafa cha mimba anatakiwa awe amezalishwa masaa mangapi baada ya kupata degedege?.....

23) Kabla ya kupewa rufaa, mnampa dawa gani mgojwa?

a) Aldomet

b) MgSO4

c) Nifedipine

Consent form – Swahili Version

Habari! Naitwa ……kutoka chuo kikuu cha afya na sayansi ya tiba,Muhimbili. Nafanya utafiti kuhusu "Uwezo wa vituo vya afya vya Dar es salaam kutoa huduma kwa wagonjwa wenye kifafa cha mimba na shinikizo la damu wakati wa ujauzito"

Lengo la utafiti huu ni kuangalia uwepo wa vifaa muhimu,dawa, miongozo muhimu na uelewa wa watoa huduma katika kutibu kifafa cha mimba na shinikizo la damu wakati wa ujauzito.

Baada ya utafiti huu,tutaweka bayana hali halisi ya upatikanaji wa huduma kwa wagonjwa wenye kifafa cha mimba na shinikizo la damu wakati wa ujauzito na kutoa mapendekezo ya jinsi ya kuboresha huduma na kupunguza ulemavu/matatizo yanayosababishwa na kifafa cha mimba na shinikizo la damu wakati wa ujauzito.

Taarifa zote atakazotoa mhojiwa zitakuwa siri kati yake na mtafiti na zitatumika kwa manufaa ya tafiti tu na si vinginevyo.

Naomba ushiriki wako katika kujibu dodoso hili. Ahsante

Nakubali/nakataa…….. (Jina)

…….. (Sahihi)