



Pregnancy induced hypertension and perinatal outcomes: Development of a management framework: A proposal of research

Dorothy Kanyamura¹, Mathilda Zvinvashe² and Petty Makoni³

^{1, 2, 3} Department of Nursing Science, University of Zimbabwe College of Health Sciences, Zimbabwe

Abstract

Pregnancy induced hypertension (PIH) is a type of increased blood pressure in pregnancy and it continues to be one of the most important cause of mortality and morbidity amongst pregnant women in Zimbabwe, but to date the actual aetiology of PIH remains unidentified. There is no specific indicator for PIH in terms of prevalence and its outcomes and nothing has been done to revise the current management framework of PIH in Zimbabwe. The purpose of this study is to determine knowledge gaps in the management of PIH in order to come up with a PIH Management Framework in Zimbabwe. Mixed sequential dominant status design (QUAN/qual) will be used at six health centres in Mashonaland Central Province. Consecutive sampling will be used. A 1:1 matched case control study will be used in six health facilities in Bindura District as well as Bindura Provincial Hospital in quantitative phase and descriptive qualitative design in qualitative phase with 9 focus group discussions (FGDs) and 8 key informant interviews (KIIs). A case will be a mother with PIH and who visit health facility at 3 and 7 days and at 6 weeks. A control will be mothers without PIH who visit health facility at 3 and 7 days and at 6 weeks. A minimum sample of 217 cases and 217 controls will be used. Statistical Package for the Social Sciences (SPSS) version 20 will be used. Quantitative information will be presented and analysed mostly using ANOVA and all test will be performed at 95% ($P < 0.05$) confidence level to determine the significant difference between PIH and perinatal outcomes. Qualitative data will follow mainly a thematic data analysis and presentation model.

Keywords: Cervical Cancer and its Prevention

1. Introduction

Medical disorders of PIH are the main health catastrophe in the obstetric population because they are among the principal contributing factors of maternal as well as perinatal morbidity along with mortality (Gudeta and Regassa, 2019) [2]. According to Kolluru *et al.*, (2016) [3], PIH continues to be a burden globally. In addition, it is also linked with elevated perinatal death as well as morbidity (Kolluru *et al.*, 2016) [3].

At present, the specific physiological and pathological mechanism of PIH is not clear (Shirasuna *et al.*, 2015) [6]. Pathophysiological studies proposed that PIH is caused by inadequate trophoblastic infiltration as a result of inadequate placental perfusion (Aggarwal *et al.*, 2012) [1]. Abnormal placenta is one of the core causes of preeclampsia. Abnormal placenta implantation, uterine as well as placental perfusion can cause oxidative stress in the body, and in the end causing hypoxia. These anti-angiogenic factors have the capacity to instigate a wide range of endothelial dysfunction, which in turn leads to maternal hypertension along with constriction of blood vessels (McDonald *et al.*, 2010) [4].

A study conducted in Zimbabwe in relation to maternal and perinatal mortality indicated that PIH is among the most important contributing factors to maternal mortality as well as the third chief concern for referral in labour (Ministry of

Health and Child Welfare Zimbabwe, 2007). In addition, a study conducted by Tachiwenyika *et al.*, (2009) [7] indicated that, PIH relates to high possibility of causing perinatal mortality. Therefore, PIH is the foremost root cause of both maternal and neonatal morbidity. A further study by Muti *et al.*, (2015) [5] demonstrated that PIH affects about 5 – 8 % of pregnant women. Furthermore, it is related to undesirable pregnancy outcomes and also maternal morbidity and mortality. The city of Harare, encountered an extraordinary rate of referrals connected to PIH to central hospitals from 2009 to 2011 (Muti *et al.*, 2015) [5].

It is against this background that a study to investigate the prevalence and pregnancy outcomes among women with PIH, seeking maternity services in Bindura is conducted. However, no investigation was conducted by the health department to establish the features of the women affected or how they were being controlled. Hence, there is a gap in terms of whether the rise in referrals was caused by an increase in PIH or management at primary level. This clearly shows that there is a challenge in the management of PIH. Thus, if the problem is not addressed, more life will continue to be lost. This study is aimed at determining the prevalence of PIH and to develop a management framework for PIH and Perinatal outcomes in Mashonaland central Province.

2. Materials and methods

In this study the researcher will use mixed sequential dominant status design to develop the framework for the management of PIH and its outcomes in Mashonaland Central Province, Bindura, Zimbabwe. The Quantitative phase will be the first dominant stage and will be followed by qualitative stage. Thus, mixed sequential dominant status design comprises of the collection of quantitative and qualitative data, in order to gain an in-depth understanding of participant`s experiences in relation to PIH and its management, using this design for the preliminary stages of the quantitative approach will make it possible for the researcher to develop instruments of measurement for the study. A 1:1 matched case control study will be used in eight health facilities in Bindura District as well as Bindura Provincial Hospital. Therefore, a case will be a mother with PIH and who visit health facility at 3 and 7 days and at 6 weeks. A control will be mothers without PIH who visit health facility at 3 and 7 days and at 6 weeks. A minimum sample of 217 cases and 217 controls will be used. The women will be interviewed after ethical approval by the research bodies and after the women consented. A total of nine FGDs will be conducted; one in every facility under study and these will be done using an FGD guide. The researcher will use six clients (3 clients diagnosed with PIH and 3 without PIH) at each health centre for a single FDG. These will be selected at random basing on post natal visits (at 3, 7 days and 6 weeks post delivery).

The researcher will conduct Key informant interviews to examine current management protocols of PIH in Zimbabwe, to identify barriers to the utilisation of guidelines in the management of PIH among health care professionals and to explore facilitators in the management of PIH among health care professionals. KII will be target to ten participants. The study area has 9 health facilities (one registered nurse from three health centres, three midwives from two health centres, one DMO, one PMD will be used as Key informants and one gynaecologist and one clinician from Bindura Hospital.

2.1. Study Setting

The study setting refers to the place where the data are collected. In this study, data will be collected from nine health centres (Bindura district and Bindura provincial hospital). Bindura is a provincial town for Mashonaland Central Province and it is located approximately 89 km north-east of the capital city Harare.

2.2. Variables

The variables under study will be, Socio-demographic, maternal Age, parity, number of children, marital status, Body Mass Index (Kg/m²) and employment status

2.3. Instruments

Data will be collected using semi-structured questionnaires and interviews field notes and a researcher reflective diary in the qualitative phase. In the quantitative phase document review will be used to collect data. In the qualitative phase data will be gathered using in-depth interviews and focus group discussions. The average length of each interview will be 30 minutes. The researcher is the one who will lead the FDGs with the help of two research assistants. The

researcher will also conduct interviews with health professionals.

2.4. Inclusion criteria

For the study will include participants that share the characteristics listed below

1. They had to be directly involved in the care, and management of PIH patients.
2. They should be able to express themselves in Shona, isiNdebele or English
3. They should have accurate knowledge PIH and its management
4. Pregnant women who has been diagnosed of PIH

2.5. The exclusion criteria pertained to

Medical staff members, who are not directly involved in the care and management of PIH patients and are also not experts in PIH and its effects on pregnant women and perinatal outcome, Pregnant women who are not diagnosed of PIH are also excluded because the primary objective of the study is to determine the PIH and perinatal outcomes.

2.6. Procedures

Research participants will be recruited into the study at first with the researcher. Upon entry into the study the participants will be measured blood pressure, weight, height, urinalysis, full blood count, liver function tests, urea and electrolytes, creatinine, interview on demographic data, obstetric history, current health status, knowledge on PIH, barriers to PIH management, facilitators to PIH management, key informant interviews with health professional and recording data. FDGs will be conducted with the participants during data collection. During postnatal visits, interviews on adherence to PIH medication will be done whilst key informant interviews with health care providers in the respective health centres will be continuing. Vital observations will be continuously observed. There will be ongoing monitoring of maternal morbidities and perinatal outcomes, ongoing recording, cleaning and analysing of data. Participants will exit the study for six weeks after delivery.

Table: There will be final data entry and preparation for final analysis

Entry into the study	During Follow-up	On Exit from the study
1. Interviews on demographic data, past pregnancy history and current health status	1. Interviews on management of PIH 2. Preliminary data analysis of treatment compliance 3. Focus group discussions with clients 4. Key informant interviews with health care providers 5. measurement of blood pressure and urine analysis when necessary 6. Monitoring for perinatal outcomes	1. Monitoring for perinatal outcomes 2. Final data entry and analysis

2.7. Pilot testing

To reduce flaws and ambiguities research instruments, they should be pre-tested before they are used in the actual or targeted sample. The research instruments will thus be tested on PIH patients at Mt Darwin hospital. The participants to the pre-test will be on treatment. A sample of 10 patients will be selected for the pilot test.

2.8. Ethical Considerations

The researcher will ask for permission from responsible authorities before conducting a research. The underlying reason being to avoid lawsuit of trespassing as well as garnering support of organisational leaders in gathering information. The researcher will ensure strict privacy and confidentiality of participants by not disclosing their names on interview data as well as not including a section for name on questionnaires. This allows the respondents to answer freely to questions as well as expressing their feelings without fear. The researcher will not coerce respondents to delve into issues they feel they cannot be open about. Above this the researcher will explain to the respondents the main purpose of the research so that respondents could feel free to answer to the set question with the mind free enough to express them. In this research issues that will be disclosed include among others, the name of the researcher, and the purpose of the study and the benefits of the study. The main intention is to help respondents to decide whether they wish to participate in the study

2.9. Data analysis

Analysis will be done mainly by comparing Quantitative and qualitative outcomes as well as comparing with what literature say about the issues understudy. Qualitative data will follow mainly a thematic data analysis and presentation model. Quantitative information will be presented and analysed mostly using ANOVA and all test will be performed at 95% ($P < 0.05$) confidence level to determine the significant difference between PIH and perinatal outcomes

3. Results

Results will be discussed in terms of the variables under study and suitable recommendations will be made. The results will be used to develop a revised PIH management framework that will improve the health delivery system, care quality and will contribute significantly to the prevention of neonate's morbidity and mortality. It is hoped that the PIH framework will also direct clinical nursing practice in maternal settings in relation to PIH management and what is specifically expected of nurses and PIH patients in those settings.

4. Acknowledgements

The study is being funded by the NORHED.

5. References

1. Aggarwal M, Gagandeep K, Walia, Eleonora Staines-Urias, Juan P, Casas, Christopher Millett. Prevalence of and risk factors for eclampsia in pregnant women in India, Family Medicine and Community Health, India, 2012.
2. Gudeta RA, Regassa KS, Singhi M. Burden of non

communicable diseases in South Asia. BMJ. 2019; 328:807-10.

3. Kolluru V, Ramya Y, Kaul HR. Maternal and perinatal outcome associated with pregnancy induced hypertension. Department of Obstetrics and Gynaecology, Kamineni Institute of Medical Sciences, Nalgonda, Telangana, India International Journal of Reproduction, Contraception, Obstetrics and Gynecology Kolluru V *et al.* Int J Reprod Contracept Obstet Gynecol. 2016; 5(10):3367-3371
4. McDonald C, Worku A, Molla M, Finlay JE, Leaning, J, Yamin AE. Consequences of maternal mortality on infant and child survival: a 25-year longitudinal analysis in Butajira Ethiopia (1987-2011). Report Health. 2015; 12(Supple 1).
5. Muti M, Tshimanga M, Notion GT, Bangure D, Chonzi P. Prevalence of pregnancy induced hypertension and pregnancy outcomes among women seeking maternity services in Harare, Zimbabwe. BMC Cardiovascular Disorders, 2015, 15(111).
6. Shirasuna KL, Siu SC, Sermer M, Colman JM. Prospective multicenter study of pregnancy outcomes in women with heart disease. Circulation. 2015; 104:515-21.
7. Tachiwenyika E, Gombe N, Shambira G, Chadambuka A, Tshimanga M. Determinants of Perinatal mortality in Marondera district, Mashonaland East Province of Zimbabwe, 2009: A case control study, Pan African Journal. 2011; 8:7.