

Case Report

Pregnancy Induced Hypertension and Associated Factors among Pregnant Women in Karamara Hospital, Jijiga, Eastern Ethiopia; 2015

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Keywords

- Pregnancy induced hypertension
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Abstract

Background: Pregnancy induced hypertension (PIH) is a significance rise of blood pressure during pregnancy, occurring after 20 weeks. It includes gestational hypertension, mild pre-eclampsia, sever pre-eclampsia and eclampsia. So more, women with PIH disorders may progress from mild diseases to more serious conditions. This study assessed pregnancy induced hypertension and associated factors among pregnant women.

Methods: A hospital based cross- sectional study design was conducted in Karamara hospital, Jijiga town among 408 pregnant. Systematic random sampling was employed. The data was collected using pretested semi-structured questionnaire and analyzed using SPSS Version 20.

Results: The prevalence of pregnancy induced hypertension was 19.1 % in Karamara hospital. Maternal education ($AOR=2.5$, 95 CI% = 1.2-5.3), age ($AOR=2.73$, 95%CI = 1.31-5.7), previous history of preeclampsia ($AOR=19.3$, 95% CI% = 5.2-72.1) and family history of preeclampsia ($AOR=7.2$, 95% CI% = 2.9-17.8) were identified as predictor factors for occurrence of pregnancy induced hypertension.

Conclusion and recommendation: One out of five women developed pregnancy induced hypertension in Karamara referral Hospital, Jigjiga Ethiopia. This figure is very high compared to studies conducted in Ethiopia. Socio-demographic factors like age less than 25 years, lack formal education, previous history of PIH and family history of PIH were independent predictors of development of pregnancy induced hypertension. Hence, this study suggests that early detection and management of mothers with PIH should be mandatory as part of focused antenatal care. Lastly, this study suggests that further studies should be conducted to assess lifestyle and dietary factors, using analytical study designs.

ABBREVIATIONS

AOR: Adjusted Odds Ratio; CI: Confidence Interval; COR: Crude Odds Ratio; PIH: Pregnancy Induced Hypertension; SPSS: Statistical Package for Social Science; WHO: World Health Organization

INTRODUCTION

Pregnancy induced hypertension (PIH) is a significance rise of blood pressure during pregnancy, occurring after 20 weeks [1]. It includes gestational hypertension, mild pre-eclampsia, sever pre-eclampsia and eclampsia. So more, women with PIH disorders may progress from mild diseases to more serious conditions [2].

The major causes of maternal deaths are similar across low income countries, often obstetric in origin, and mainly severe preeclampsia and eclampsia, and infection [3]. According to

the World Health Organization (WHO) its incidence is seven times higher in developing countries (2.8% of live births) than in developed countries (0.4%) [4]. Eclampsia is reported to be associated with a maternal mortality rate of 0.5- 10% usually requiring high quality intensive care [5].

Several studies have shown that history of chronic hypertension, being unmarried, nulliparity, family history of diabetes mellitus, extreme ages, race (being black) and others as risk factors for this problem [6].

However, there is paucity of information on the prevalence of pregnancy induced hypertension and associated factors in the study area. Hence, this study was conducted to explore magnitude of pregnancy induced hypertension and associated factors among pregnant women, in Karamara Hospital, Jigjiga city of Somali regional state.

METHODS

Study setting

The study was conducted in Jijiga Karamara hospital which is found in the capital of the Somali region state of Ethiopia. The region is a Pastoralist and Agro-pastoralist area and known for very lower prevalence rate of maternal health services. Karamara Hospital provides maternal, medical, surgical and pediatric health services. It has a total of 95 beds and 27 of them found in maternity ward.

Study design and sample

A Hospital based cross-sectional study was conducted in Karamara hospital, Jijiga town from February up to May 2015. All pregnant mothers attended maternal care services were our source population. All pregnant mothers who attend maternal care service after 20 weeks of gestation were included in the study. Mothers have history of chronic hypertension excluded from this study.

Sample size determination

The required sample size was determined using single population proportion formula with the following assumptions:

Level of confidence= 95%

Type I error (α) =0.05

5% margin of error

Based on the assumption the prevalence pregnancy induced hypertension is 50%.

$$n = \frac{\left(Z \alpha/2 \right)^2 \times P(1-P)}{d^2}$$

$$n = \frac{(1.96)^2 \times 0.5(1-0.5)}{(0.05)^2} \quad n = 384$$

Given 10% non response rate, the final sample size is 423.

Sampling procedure

Source population estimated based on Karamara hospital maternal care service quarter year plan reports. So, Individual study subjects were selected by systematic random sampling during the data collection period until the required sample size was obtained. The sampling interval ($k = 2$) was calculated by dividing the study population to the total sample size (423) and this interval was used to select study subjects. The first client was selected by simple random sampling among the first two maternal care service users based on the sampling frame.

Data collection and instrument

Data were collected by interviewer administered technique using a pretested semi-structured questionnaire developed from literatures [7-9]. Questionnaire was prepared first in English then translated to local language (Somali), and back to English. It contains socio-demographic characteristics of mothers, obstetric history, signs and symptoms at presentation, laboratory data and

maternal and prenatal outcomes. Four midwives were involved in the data collection; and data quality was maintained through intensive supervision, pretesting and data collector training.

Data processing and analysis

Data were cleaned, edited, and entered onto Epidata version 3.2.1 and exported to the statistical packages for social sciences (SPSS) version 20 statistical software for further analysis. Frequency distribution and cross tabulation were done against the variables of interest. Bivariate analyses were done to assess the association between explanatory variables and outcome variable of the study. All variables with a p-value of < 0.25 at the bivariate analysis were included into multivariable logistic regression model in which odds ratio with 95% confidence intervals were estimated to identify independent predictors of pregnancy induced hypertension. P-values less to 0.05 were employed to declare the statistical significance.

Operational definitions

Chronic hypertension: Diastolic blood pressure 90 mm Hg or more before first 20 weeks of gestation

Gestational hypertension defined as a blood pressure 110 by 90 mmHg four hours apart after 20 weeks of gestation without proteinuria.

Preeclampsia is a pregnant woman with Gestational hypertension plus proteinuria was diagnosed

Mild preeclampsia is when two readings of diastolic blood pressure 90–110 mm Hg 4 hours apart after 20 weeks gestation and Proteinuria up to 2+ through dipstick

Sever preeclampsia is when two readings of diastolic blood pressure 110 mm Hg or more after 20 weeks gestation and Proteinuria 3+ or more with blurred vision, severe headache, oliguria, altered mental status and epi-gastric pain.

Eclampsia is when Diastolic blood pressure 90 mm Hg or more after 20 weeks gestation with Convulsions and Proteinuria 2+ or more high BP and plus seizure that cannot be attributed to some other cause.

RESULTS

Socio -demographic characteristics

From a total of 423 sampled mothers, 408 were interviewed making a response rate of 96.45%. More than three fourth of the respondents were between the age of 20-34, with a mean age of 26.3 (± 5.4 SD) years. Majority (80.1%) of them was urban dwellers and married (95.6%). Muslim 332 (81.4 %) and the Somali ethnic group 255 (62.5%) were found to be predominant than others. Regarding to educational status, 101(24.8%) mothers had no formal education, while 37.5 % (153) respondents attended secondary and more (Table 1).

Medical history and clinical condition

One out of ten pregnant women (8.1%) had previous history of renal disease. In addition, 24(5.9%) of respondents had pregnancy induced hypertension in their previous pregnancy and forty-two (10.3%) of mothers had family history of pregnancy induced hypertension. Current clinical condition of the mother

Table 1: Socio demographic characteristics of pregnant women attend maternal care service, Karamara Hospital, Ethiopia, 2015.

Variables	Frequency	Percent
Age of mothers(year)		
<=20 years	73	17.9
20-34 years	316	77.5
>=35 years	19	4.7
Residence		
Urban	327	80.1
Rural	81	19.9
Marital status		
Married	390	95.6
Others***	18	4.4
Religion		
Muslim	332	81.4
Orthodox	44	10.8
Protestant	22	5.4
Catholic	10	2.5
Ethnicity		
Somali	255	62.5
Oromo	56	13.7
Amhara	45	11.0
Guragie	26	6.4
Others	26	6.4
Maternal Education		
No formal education	101	24.8
Primary education	154	37.7
Secondary education or more	153	37.5
Occupation of the mother		
Employed*	98	24.0
Un employed**	310	76.0

NB: *Government organization employees, Private organization employees;
** House waives, Daily labours, Farmers, merchants, business owners, students;
***Single, Divorced, Widow, Cohabited, Separated

revealed Fifty-nine (14.5%) of respondents developed pitting edema (Table 2)

Regarding occurrence of pregnancy induced hypertension, 93 (19.1%) of the respondents had pregnancy induced hypertension. Thirty-four (8.3%) of pregnant women developed mild preeclampsia, 17 (4.2%) had develop severe preeclampsia, 13 (3.2 %) had develop eclampsia, 14 (3.4) had gestational hypertension (Figure 1).

Factor influencing pregnancy induced hypertension

In multivariate analysis age, maternal education, previous history of PIH and family history of PIH were identified as an independent predictor for pregnancy induced hypertension. The odds of pregnancy induced hypertension increase among women age>=25 year (AOR: 2.7, 95% CI 1.3-5.7), without formal education (AOR: 2.5, 95% CI: 1.2-5.3), family history of preeclampsia (AOR: 6.2, 95% CI: 2.9-12.8), and family history of PIH (AOR: 19.3, 95% CI: 5.2-72.1) than their respective counter parts (Table 3).

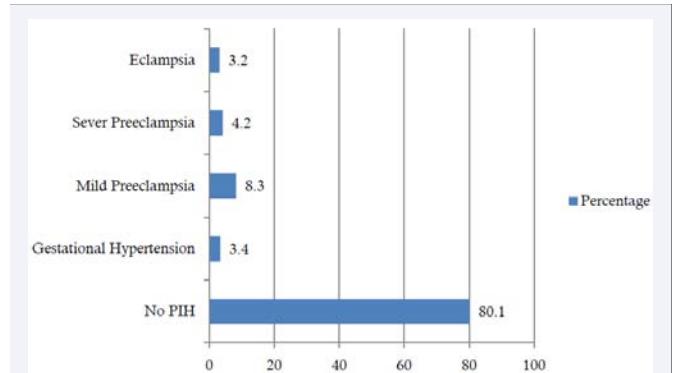


Figure 1 Distribution of different pattern of pregnancy induced hypertension among pregnant mothers attended maternal care services in Karamara Hospital, Ethiopia, 2015.

Table 2: Medical history and related conditions of pregnant women attended maternal care services, Karamara Hospital, Ethiopia, 2015.

Variables	Frequency	Percent
History of renal disease		
Yes	33	8.1
No	375	91.9
Previous history of PIH		
Yes	24	5.9
No	384	94.1
Family history of PIH		
Yes	42	10.3
No	366	89.7
Edema		
Pitting Edema	59	14.5
Non pitting Edema	349	84.5
Protein urea(on dipstick testing)		
No	341	83.6
1+	2	0.5
2+	43	10.5
>=3+	22	5.4
Blood pressure		
Systolic blood pressure		
90-129	301	73.8
130-139	25	6.1
140-159	27	6.6
160-179	48	11.8
>=180	7	1.7
Diastolic blood pressure		
<60	108	26.5
60-89	201	49.3
90-99	19	4.7
100-109	42	10.3
>=110	38	9.3

DISCUSSION

The magnitude of pregnancy induced hypertension was 19.1 % in Karamara hospital. It was high compared to studies in Ethiopia Tikur Anbessa hospital and Jimma referral hospital because 5.3% and 8.5% of pregnant women had pregnancy induced hypertension (PIH) respectively [10,11].This might be

Table 3: Multivariate logistic regression showing predictor factors of pregnancy induced hypertension among pregnant women attended maternal care services in Karamara Hospital, 2015.

Variables	Pregnancy induced hypertension			
	Presence	Absence	COR(95%CI)	AOR(95%CI)
Age				
>=25 year	51(23.2%)	169(76.8%)	1.8(1.07-3.0)	2.7 (1.3-5.7)
<25 year	27(14.4%)	161(85.6%)	1	1
Maternal education				
No formal education	33(32.7%)	68(67.3 %)	2.8(1.7-4.8)	2.5(1.2-5.3)
Formal education	45(14.7%)	262(85.3 %)	1	1
Gravidity				
Primigravida	40(22.9 %)	135(77.1 %)	1.5(0.9-2.5)	1.6(0.8-2.8)
Multigravida	38(16.3 %)	195(83.7 %)	1	1
Previous history of PIH				
Yes	19(79.2 %)	5(20.8 %)	20.9(7.5-58.2)	19.3%(5.2-72.1)
No	59(15.4 %)	325(84.6 %)	1	1
Family history of PIH				
Yes	22(52.4%)	20(47.6%)	6.1(3.1-11.9)	6.2(2.9-12.8)
No	56(15.3 %)	310(84.7 %)		1

Abbreviations: COR: Crude Odds Ratio; AOR: Adjusted Odds Ratio; CI: Confidence Interval

as a result of high amount of referral cases because it were the only tertiary hospital in the region.

Pregnancy induced hypertension is influenced by varying and complex interrelated factors and multivariate logistic analysis showed that risk of pregnancy induced hypertension increases with age. Likewise, a study conducted in Dessie referral hospital and Ghana municipality and finiland showed that advanced maternal age was significantly associated with pregnancy induced hypertension [12-14].

The odds of pregnancy induced hypertension among mothers had no formal education 2.5 times than among mothers had formal education. It is in agreement with study conducted in mustaf hospital in Ilam which showed that the risk of preeclampsia increased 4 times in illiterate's women compared to women with academic education [15].

The odds of pregnancy induced hypertension 19.3 times increase among mothers had previous History of preeclampsia. Similarly a retrospective case control study conducted in Jahun, Nigeria showed that personal history of preeclampsia is 21.5 times increase the chance of developing severe preeclampsia/eclampsia [16]. This might be as a result of maternal immune system disorder which cause the second wave of trophoblastic invasion fails due to destruction of the invading trophoblasts as the production of blocking antibodies has failed in early gestation.

The odds of pregnancy induced hypertension 7.2 times increase among mothers with family history of preeclampsia. It is congruent with study conducted in Dessie referral hospital and Ghana Municipality revealed that woman having family history of hypertension are found to be strongly associated with preeclampsia (12,13). This might be as a result of genetic inheritance which causes dilator and constrictor imbalances at microvasculature levels.

CONCLUSION AND RECOMMENDATION

One out of five women developed pregnancy induced

hypertension in Karamara referral Hospital, Jigjiga Ethiopia. This figure is very high compared to studies conducted in Ethiopia. Socio-demographic factors like age less than 25 years, lack formal education were significantly associated with pregnancy induced hypertension. In addition, medical histories like previous History of PIH and Family history of PIH were independent predictors of development of pregnancy induced hypertension.

Hence, this study suggests that early detection and management of mothers with PIH should be mandatory as part of focused antenatal care. Lastly, this study suggests that further studies should be conducted to assess lifestyle and dietary factors, using analytical study design

DECLARATIONS

Ethical approval and consent to participate

The ethical approval and clearance for the study before data collection were obtained from Jigjiga University research publication and technology transfer office. Official letters were obtained from Karamara Hospital. At the time of data collection, Informed consent was obtained from the respondents after explaining the purpose of the study.

Availability of data and materials

The data of this study available from the corresponding author and will be avail on reasonable request.

Author's contribution

LM conceived and designed the study, performed analysis and interpretation of data and drafted the manuscript. ZS, EW and SH participated in design conception, analysis, and interpretation of data and the critical review of the manuscript. All authors read and approved the final manuscript.

Conflict of interest

We authors declare that we have no competing interests regarding the publication of this paper.

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REFERENCES

1. Medicine for Africa - Medical Information Service. Preeclampsia/eclampsia. 2008.
2. Federal Democratic republic of Ethiopia, Ministry of health, Basic emergencies obstetrics and Neonatal care training manual. 2014.
3. Alvarez JL, Gil R, Hernández V, Gil A. Factors associated with maternal mortality in Sub-Saharan Africa: an ecological study. BMC Public Health. 2009; 9: 462.
4. WHO. Monitoring Emergency Obstetric Care: a Handbook. Geneva: WHO. 2009.
5. Aali BS, Ghafoorian J, Mohamad-Alizadeh S. Severe preeclampsia and eclampsia in Kerman, Iran: complications and outcomes. Med Sci Monit. 2004; 10: 163-167.
6. Roberts JM, Lain KY. Recent Insights into the pathogenesis of pre-eclampsia. Placenta. 2002; 23: 359-372.
7. Ganesh KS, Unnikrishnan B, Nagaraj K, Jayaram S. Determinants of Pre-eclampsia: A Case-control Study in a District Hospital in South India. Indian J Community Med. 2010; 35: 502-505.
8. Kazemian E, Sotoudeh G, Dorosty-Motlagh AR, Eshraghian MR, Bagheri M. Maternal Obesity and Energy Intake as Risk Factors of Pregnancy-induced Hypertension among Iranian Women. J Health Popul Nutr. 2014; 32: 486-493.
9. de Oliveira AC, Santos AA, Bezerra AR, de Barros AM, Tavares MC. Maternal Factors and Adverse Perinatal Outcomes in Women with Preeclampsia in Maceió, Alagoas. Arq Bras Cardiol. 2016; 106: 113-120.
10. Teklu S, GayM A. Prevalence and clinical correlates of the hypertensive disorders of pregnancy at tikur anbesa hospital Addis Ababa, Ethiopia. Ethio Med J. 2006; 44: 17-26.
11. Wolde Z, Segni H, Woldie M. Hypertensive Disorders of Pregnancy in Jimma University Specialized Hospital. Ethiop J Health Sci. 2011; 21: 147-154.
12. Tessema GA, Tekeste A, Ayele TA. Preeclampsia and associated factors among pregnant women attending antenatal care in Dessie referral hospital, Northeast Ethiopia: a hospital-based study. BMC Pregnancy Childbirth. 2015; 15: 73.
13. Jones L, Takramah W, Axame WK, Owusu R, Parbey PA, Tarkang E, et al. Risk Factors Associated with Pregnancy Induced Hypertension in the Hohoe Municipality of Ghana. J Prev Med Healthc. 2017; 1: 1011.
14. Lamminpää R, Vehviläinen-Julkunen K, Gissler M, Heinonen S. Preeclampsia complicated by advanced maternal age: a registry-based study on primiparous women in Finland 1997-2008. BMC Pregnancy Childbirth. 2012; 12: 47.
15. Direkvand-Moghadam A, Khosravi A, Sayehmiri K. Predictive factors for preeclampsia in pregnant women: a Receiver Operation Character approach. Arch Med Sci. 2013; 9: 684-689.
16. Guerrier G, Oluyide B, Keramarou M, Grais RF. Factors associated with severe preeclampsia and eclampsia in Jahun, Nigeria. Int J Womens Health. 2013; 5: 509-513.

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