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RESEARCH ARTICLE

PREDICT RISK FACTORS OF PREECLAMPSIA AMONG PREGNANT WOMEN ATTENDED ANTENATAL CARE CLINIC AT JIBLAH UNIVERSITY HOSPITAL, YEMEN: A CROSS SECTIONAL STUDY

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ABSTRACT

Background: Preeclampsia and its complications is one of the leading causes of maternal mortality in Yemen. Globally, Yemen ranks as one of the top countries with the highest maternal mortality. To the best of our knowledge no similar study has been done at Jiblah University Hospital, Yemen. **Objective:** The aim of this study was to determine the Prevalence and associated factors of preeclampsia among pregnant women Attending Jiblah University Hospital, Yemen. **Methods:** A hospital-based cross sectional study design was utilized. A total 100 pregnant women attended Antenatal Care Clinic at Jiblah University Hospital, Yemen and selected randomly. Two tools were used: Tool (1): A structured closed-ended questionnaire included Socio-demographic data, behavioral factors, medical history. Tool (2): Physical examination of the pregnant women. Collected data were analyzed by using SPSS Version 26. Bivariate data analysis using the Chi-square test. P-value is considered statistically significant when $P < 0.05$. **Results:** The prevalence of preeclampsia was 15% among participants in the study. There was a significant association between number of previous pregnancies, hypertension, diabetes for pregnant women, obesity, previous preeclampsia, and prior knowledge of preeclampsia. **Conclusions:** Multiple risk factors are predicting preeclampsia, such; as number of previous pregnancies hypertension, diabetes for pregnant women, obesity, previous preeclampsia, and prior knowledge of preeclampsia which can be used as a preventing tool of preeclampsia.

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INTRODUCTION

Preeclampsia (PE) is a pregnancy specific disorder characterized by hypertension (140/90 mmHg) and significant proteinuria (albumin >300 mg in 24 h) (1) with or without edema (2) and occurs after 20 weeks of gestation along with proteinuria (3). Globally, preeclampsia is the second leading cause of maternal death and it has been associated with maternal morbidity and adverse prenatal outcome (4), about 12% of mothers die only from preeclampsia (3) and over 99% of these deaths occurred in low- and middle-income countries (5). As estimated by WHO, the occurrence of preeclampsia is seven times higher in developing countries compared to developed countries. Preeclampsia and eclampsia together, affect about 10% of all pregnant women around the world (6). The prevalence of preeclampsia ranges between 1.8 and 16.7% in developing countries (3). Over the years, studies reveal that there is variation in preeclampsia incidence and prevalence (2), which is still significant, especially in developing countries including Yemen and yet a major threat to maternal and neonatal health.

Jiblah university hospital is located in Jiblah town, which is one of Ibb governorate that located in south-western Yemen. Jiblah University Hospital was called American Baptist Hospital and was opened in 1965 by the American Baptist Association through an agreement with the Yemeni Ministry of Health to provide many important medical services to citizens at symbolic prices and charitable services. The hospital received the Ministry of Public Health and Population from the association in 2003. Antenatal Care Clinic (ANC) at Jiblah University Hospital provides antenatal care services for the pregnant women in Ibb and neighboring governorates. There is paucity of information on the prevalence of preeclampsia in Yemen. To the best of our knowledge, no similar study has been done at Jiblah University Hospital hence, this study aimed to access the prevalence, demography distribution and associated risk factors of preeclampsia among pregnant women attending Jiblah university hospital.

MATERIALS AND METHODS

A hospital cross sectional descriptive research design was used. The present study was conducted in Antenatal Care Clinic (ANC) at Jiblah university Hospital. This clinic is the reference clinic in Ibb Governorate which provides antenatal care services for the pregnant women. A total number 100 of convenience random sampling of pregnant women who attended at ANC. All pregnant women who agree to participate in the study were included. Pregnant women mental disorders were excluded.

Two tools were utilized in the current study: Tool (1) Structured questionnaire was developed, it included three parts:

Part (1): Socio-demographic data and life style such as, age, level of education, monthly income, khat chewing, degree of consanguinity, age of pregnancy and number of previous pregnancies.

Part (2): Family history of risk factors for PE such as: previous PE in family, Knowledge about preeclampsia, prior knowledge of preeclampsia, previous preeclampsia infection, obesity, history of diabetes mellitus, chronic hypertension, chronic kidney disease and cardiovascular diseases.

Part (3): Medical and obstetric history such as: gestational age at the beginning of the current study, order of pregnancy, number of parity, history of preeclampsia, hypertension, diabetes mellitus and outcome of the present pregnancy.

Tool (2): Physical examination of the pregnant women including: blood pressure, weight, height, signs of edema and urine analysis. The obtained data were statistically analyzed using Statistical Package for the Social Sciences (SPSS) version 26 and Microsoft Excel. Statistical significance was defined by using the chi-square test at $P < 0.05$ for categorical variables.

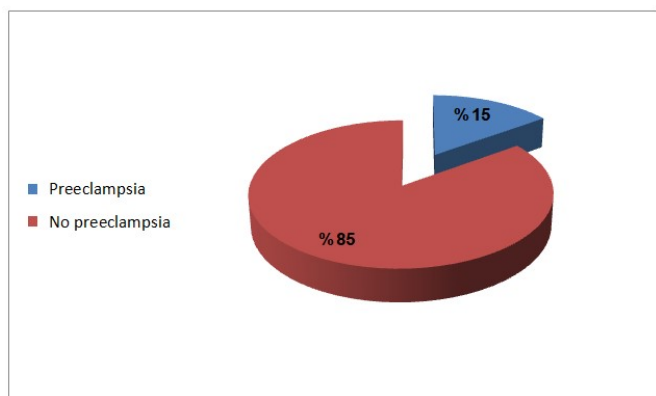


Figure 1. Prevalence of preeclampsia among study population

RESULTS

The study population consisted of $n = 100$ pregnant women. The mean maternal age was 27.5 ± 6.5 (years). The majority 47% (47) of the study participants were aged between 24-30 years and only 2% (2) aged more than 45 years old. Concerning level of education, those with primary level of education were the highest percentage 42% (42) whereas those of the graduate level of education had the least 5% (5). For monthly income, 73% (73) had monthly income less than YR. 30000 (US\$ 50). Majority of the participants were khat chewing 66% (66). Regarding number of previous pregnancies, majority, of participants had four or less previous pregnancies 74% (74), whereas, only 2% (2) had ten or more previous pregnancies. Most of participants had no blood pressure 82% (82). In this study, 4% (4) of the preeclamptic subjects were diabetic, and obesity was observed in 38% (38) of population study. Concerning prior knowledge of preeclampsia, 52% (52) had knowledge and 48% (48) had no knowledge.

Majority of pregnant women had no previous preeclampsia infection 84% (84) and only 16% (16) had previous preeclampsia infection. More details as shown in Table 1. The prevalence of preeclampsia in this study was 15% (Figure 1). Several factors were studied concerning risk factors associated with preeclampsia among study population. Preeclampsia was significant associated with educational status ($P < 0.013$), number of previous pregnancies ($P < 0.001$), high blood pressure ($P < 0.000$), diabetes ($P < 0.045$), obesity ($P < 0.002$), prior knowledge of preeclampsia ($P < 0.001$), preeclampsia in previous pregnancy ($P < 0.006$). Whereas, age, monthly income and khat chewing were not associated with preeclampsia (Table 1).

DISCUSSION

Worldwide, preeclampsia remains a public health problem in both developed and developing countries (6). The incidence of preeclampsia in developing countries ranges between 1.8-16.7%, whereas, in developed countries is 0.4% (5). In this study, the prevalence of preeclampsia was 15% which is higher than studies reported in Hajjah and Sana'a in Yemen 7.6% (7) and 3.9% (8) respectively. Also, the finding of the present study is higher in studies conducted in Bahrain, 1.95%, Saudi Arabia, 4.2% (9), China 2.65% (10) and 3% in Pakistan (5). However, it was found to be low in the studies carried out in Egypt, 16.1% (6) and 26.3% in Tanzania (11). This discrepancy could be a difference in study time duration, sample size, study setting and site of the study. Regarding to the relationship between the age and preeclampsia, no significant relationship was founded in this study ($P < 0.106$). The present result is similar to studies conducted in Ghana (4), Yemen (7), Bengaluru (12), Indonesia (13) and in Bangladesh (3), while, dissimilar to that studies carried out in Ethiopia (14), Egypt (6) and Nigeria (15). Sweden and China (16). This study demonstrates there is association between educational status and preeclampsia ($P < 0.013$) in which, the developing of preeclampsia increased with decreasing educational level of study population. This could be explained the role of education in fighting all threats regarding to people health through educate them especially pregnancy women how can safe them self from that threats. The funding of this study agreed with a studies conducted in Pakistan (5), Ghana (17) and in Uganda (18). Monthly income and khat chewing were found to be no associated with preeclampsia. Concerning number of previous pregnancies, the present study showed there was statistically different between them ($P < 0.013$). Similar studies carried out in Saudi Arabia (2, 19), Tanzania (12) and in Bahrain (20).

Thus increasing number of pregnancies is considered as predictor for developing preeclampsia. Strong statistical significance was found in this study between high blood pressure and preeclampsia ($P < 0.000$). The current study agreed with other studies conducted in Bahrain (20), Pakistan (7) and in Egypt. This finding consistent with a secondary analysis of a WHO Global Survey conducted in 23 low and middle-income countries, which reported that women who suffered chronic hypertension were almost 8 times more likely to become infected with preeclampsia or eclampsia than women without the condition (21). Keeping blood pressure at an optimal level during pregnancy is important for life saving of mother and infant from preeclampsia and its complications. In this study, diabetics infection was found to be marginally significantly associated with preeclampsia ($P < 0.045$). Pregnant women who are diabetes more infected with preeclampsia from that are not diabetic. This result similar to other studies reported in Ethiopia (22), Ireland (23) and in Bahrain (21). This might be explained by the role of diabetes in causing narrowing of blood vessels leading to many health problems during pregnancy. These results are in contrast with the previous finding in china (10). Concerning obesity of pregnant women and preeclampsia, the current study revealed strong association between obesity and preeclampsia ($P < 0.002$). Previous studies carried out in India (12), Sweden and China (16) reported similar finding of the current study. In obese pregnant women, levels of free fatty acids and triglyceride may be increased as a result for obesity which is considered as predictor for preeclampsia.

Table 1. Socio demographic characteristics of study population (n = 100)

| Variable | No. (%) | Preeclampsia infected | Preeclampsia Non-infected | P value |
|---------------------------------|---------|--------------------------|------------------------------|---------|
| | | No. (%) | No. (%) | |
| Age (years) | | | | 0.106 |
| ≤ 23 | 27 (27) | 2 (7.41) | 25 (92.59) | |
| 24-30 | 47 (47) | 5 (10.64) | 42 (89.36) | |
| 31-37 | 17 (17) | 5 (29.41) | 12 (70.59) | |
| 38-44 | 7 (7) | 2 (28.57) | 5 (71.43) | |
| ≥ 45 | 2 (2) | 1 (50) | 1 (50) | |
| Education status | | | | 0.013 |
| Unable to read and write | 22 (22) | 8 (36.36) | 14 (63.64) | |
| Primary education | 42 (42) | 5 (11.9) | 37 (88.1) | |
| Secondary education | 31 (31) | 2 (6.45) | 29 (93.55) | |
| Graduate education | 5 (5) | 0 (0) | 5 (100) | |
| Monthly income | | | | 0.570 |
| Less than RY. 30000 | 73 (73) | 10 (13.7) | 63 (86.3) | |
| RY. 30000-50000 | 22 (22) | 5 (22.73) | 17 (77.27) | |
| More than 50000-80000 | 1 (1) | 0 (0) | 1 (100) | |
| More than RY. 80000 | 4 (4) | 0 (0) | 4 (100) | |
| Khat chewing | | | | 0.640 |
| Yes, | 66 (66) | 11 (16.67) | 55 (83.33) | |
| No | 34 (34) | 4 (11.76) | 30 (88.24) | |
| No. of previous pregnancies | | | | 0.001 |
| ≤ 4 | 74 (74) | 7 (9.46) | 67 (90.54) | |
| 5-9 | 24 (24) | 6 (25) | 18 (75) | |
| ≥ 10 | 2 (2) | 2 (100) | 0 (0) | |
| Having blood pressure | | | | 0.000 |
| Yes, | 18 (18) | 10 (50.56) | 8 (44.44) | |
| No | 82 (82) | 5 (6.10) | 77 (93.90) | |
| Having diabetes | | | | 0.045 |
| Yes, | 4 (4) | 2 (50) | 2 (50) | |
| No | 96 (96) | 13 (13.54) | 83 (86.46) | |
| Obesity | | | | 0.002 |
| Yes, | 38 (38) | 11 (28.95) | 27 (71.05) | |
| No | 62 (62) | 4 (6.45) | 58 (93.55) | |
| Prior knowledge of preeclampsia | | | | 0.001 |
| Yes, | 52 (52) | 14 (26.92) | 38 (73.08) | |
| No | 48 (48) | 1 (2.08) | 47 (97.92) | |
| Previous preeclampsia infection | | | | 0.006 |
| Yes, | 16 (16) | 6 (37.5) | 10 (62.50) | |
| No | 84 (84) | 9 (10.71) | 75 (89.29) | |

The current study reported that, prior knowledge of preeclampsia is effective factor in the incidence of preeclampsia ($P < 0.001$). The finding of this study is in line with other studies which done in Saudi Arabia (2, 9), Ghana (17) and in Tanzania (24). From the results of the present study and previous studies, prior knowledge of preeclampsia, attitude regarding to awareness about risk factors, symptoms and complications of preeclampsia are the most important for preventing of preeclampsia during pregnancy. The present study represents there is strong association between previous preeclampsia infection and preeclampsia ($P < 0.001$). pregnant women who previously infected with preeclampsia are at high risk for again with preeclampsia. the result of this study likely similar to studies conducted in Tanzania (11) and Egypt (6), while other studies carried out in Saudi Arabia (19) and Ghana (17) disagreed with the finding of the current study. The discrepancy among these studies may be due to methods of study, socio demographic data, health facilities availability.

CONCLUSION

Yemen ranks as one of the top countries with the highest maternal mortality in the world. Preeclampsia and its complications is one of the leading causes of maternal mortality in Yemen. Based on the results of the present study, prevalence rate of preeclampsia in the study area was 15%. The present study concluded that multiple risk factors for predicting preeclampsia were number of previous pregnancies, knowledge of previous preeclampsia infection, and prior knowledge of preeclampsia in addition hypertension, diabetes and obesity, which can be used as a preventing tools of preeclampsia.

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List of abbreviations arranged in alphabetical order

| | |
|------|---|
| ANC | Antenatal Care Clinic |
| PE | Preeclampsia |
| SPSS | Statistical Package for the Social Sciences |
| WHO | World Health Organization |

REFERENCES

- Nawsherwan, Khan A, Mubarik S, Nabi G, Fan C, Wang S. Effect of preeclampsia and premature rupture of membrane on neonatal birth weight and length by gestational age: A retrospective study in China. *J Res Med Sci.* 2021 Jun 30;26:38. doi: 10.4103/jrms.JRMS_131_19. PMID: 34484370; PMCID: PMC8384008.
- Reem Mudhhi Essa Al-Anazi , Hadil Anwar Aljaber , Sara Ghazi Alenezi. (2019). Prevalence and risk factors of pre-eclampsia and

- eclampsia among pregnant women in arar city, ksa. *indo american journal of pharmaceutical sciences*, 06 (01), 1750–1759. <https://doi.org/10.5281/zenodo.2547742>
3. Mou, A.D., Barman, Z., Hasan, M. et al. Prevalence of preeclampsia and the associated risk factors among pregnant women in Bangladesh. *Sci Rep* 11, 21339 (2021). <https://doi.org/10.1038/s41598-021-00839-w>
 4. Nyarko Adwoa, Joshua A. Kunfah, Collins Adombine Akayuure, Jamilatu Kappiah, Sylvanus Kampo. Prevalence and demographic distribution associated with pre-eclampsia among pregnant women at a local Teaching Hospital in Ghana. doi: <https://doi.org/10.1101/2022.05.18.22275250>
 5. Khan B, Allah Yar R, Khakwani AK, Karim S, Arslan Ali H. Preeclampsia Incidence and Its Maternal and Neonatal Outcomes With Associated Risk Factors. *Cureus*. 2022 Nov 6;14(11):e31143. doi: 10.7759/cureus.31143. PMID: 36483900; PMCID: PMC9723483.
 6. Elham M. Ahmed, Rabaa H. Hassanen, Ahmed M Abbas & Shaimaa A. Kalaf. Predict Risk Factors of Preeclampsia Among Pregnant Women Attended Antenatal Clinic at Assiut University Hospital. Article 15, Volume 6, Issue 14 - Serial Number 2, August 2018, Page 145-156. DOI: 10.21608/asnj.2018.59047
 7. Al-Rukeimi Abdullah A., Al-Haddad Ahmed, Adam Ishag, Risk factors for pre-eclampsia, eclampsia, and associated adverse outcomes in Hajjah, Yemen, *International Journal of Gynecology and Obstetrics* (2014), doi: 10.1016/j.ijgo.2014.06.007
 8. Al-Tairi, A.N.Q., Isa, Z.M. & Ghazi, H.F. Risk factors of preeclampsia: a case control study among mothers in Sana'a, Yemen. *J Public Health* 25, 573–580 (2017). <https://doi.org/10.1007/s10389-017-0825-0>
 9. Alalem, Dania H. and L. Aldukkan. "Prevalence and Associated Risk Factors for Preeclampsia among Pregnant Women Attending Antenatal Care Inking Abdulaziz University Hospital in Jeddah, Saudi Arabia: A Hospital-Based Study." *Annals of International medical and Dental Research* 4 (2017): n. pag.
 10. Lin, Li; Huai, Jing; Su, Rina; Wang, Chen; Li, Boya; Yang, Huixia. Incidence and Clinical Risk Factors for Preeclampsia and Its Subtypes: A Population-Based Study in Beijing, China. *Maternal-Fetal Medicine* 3(2):p 91-99, April 2021. | DOI: 10.1097/FM9.0000000000000099
 11. Machano, M.M., Joho, A.A. Prevalence and risk factors associated with severe pre-eclampsia among postpartum women in Zanzibar: a cross-sectional study. *BMC Public Health* 20, 1347 (2020). <https://doi.org/10.1186/s12889-020-09384-z>
 12. Nath A, Sheeba B, Sisira R, Metgud CS. Prevalence of hypertension in pregnancy and its associated factors among women attending antenatal clinics in Bengaluru. *J Family Med Prim Care*. 2021 Apr;10(4):1621-1627. doi: 10.4103/jfmpc.jfmpc_1520_20. Epub 2021 Apr 29. PMID: 34123902; PMCID: PMC8144779.
 13. Yushida Y, Zahara E. The Risk Factors toward Preeclampsia Events of Pregnant Women in Meureubo and Johan Pahlawan Community Health Center West Aceh. *Open Access Maced J Med Sci*. 2020 Dec 12; 8(E):670-673. <https://doi.org/10.3889/oamjms.2020.5531>
 14. Belay, A.S., Wudad, T. Prevalence and associated factors of preeclampsia among pregnant women attending anti-natal care at Mettu Karl referral hospital, Ethiopia: cross-sectional study. *Clin Hypertens* 25, 14 (2019). <https://doi.org/10.1186/s40885-019-0120-1>
 15. Akaba GO, Anyang UI, Ekele BA. Prevalence and materno-fetal outcomes of preeclampsia/eclampsia amongst pregnant women at a teaching hospital in north-central Nigeria: a retrospective cross-sectional study. *Clin Hypertens*. 2021 Oct 15;27(1):20. doi: 10.1186/s40885-021-00178-y. PMID: 34649619; PMCID: PMC8518182.
 16. Nawsherwan, Khan A, Mubarik S, Nabi G, Fan C, Wang S. Effect of preeclampsia and premature rupture of membrane on neonatal birth weight and length by gestational age: A retrospective study in China. *J Res Med Sci*. 2021 Jun 30;26:38. doi: 10.4103/jrms.JRMS_131_19. PMID: 34484370; PMCID: PMC8384008.
 17. Fondjo, L.A., Boamah, V.E., Fierti, A. et al. Knowledge of preeclampsia and its associated factors among pregnant women: a possible link to reduce related adverse outcomes. *BMC Pregnancy Childbirth* 19, 456 (2019). <https://doi.org/10.1186/s12884-019-2623-x>
 18. Kiondo, P., Wamuyi-Maina, G., Bimenya, G. S., Tumwesigye, N. M., Wandabwa, J., & Okong, P. (2012). Risk factors for preeclampsia in Mulago Hospital, Kampala, Uganda. *Tropical Medicine and International Health*, 17(4), 480–487. <https://doi.org/10.1111/j.1365-3156.2011.02926.x>.
 19. Gari A, Alshantiti W, Alshantiti F, Alquzi R, Alsamli R, Alqahtani R. Level of knowledge on preeclampsia symptoms, complications, and risk factors among women in Saudi Arabia: A cross sectional study. *Medical Science* 2022; 26:ms432e2512. doi: <https://doi.org/10.54905/disssi/v26i128/ms432e2512>
 20. Tabassum S, AlSada A, Bahzad N, Sulaiabeeh N, Qureshi A, Dayoub N. Preeclampsia and Its Maternal and Perinatal Outcomes in Pregnant Women Managed in Bahrain's Tertiary Care Hospital. *Cureus*. 2022 May 1;14(5):e24637. doi: 10.7759/cureus.24637. PMID: 35663710; PMCID: PMC9156350.
 21. Stitterich N, Shepherd J, Koroma MM, Theuring S. Risk factors for preeclampsia and eclampsia at a main referral maternity hospital in Freetown, Sierra Leone: a case-control study. *BMC Pregnancy Childbirth*. 2021 Jun 2;21(1):413. doi: 10.1186/s12884-021-03874-7. PMID: 34078312; PMCID: PMC8173903.
 22. Belay AS, Wudad T: Prevalence and associated factors of preeclampsia among pregnant women attending anti-natal care at Mettu Karl Referral Hospital, Ethiopia: cross-sectional study. *Clin Hypertens*. 2019, 25:14. 10.1186/s40885-019-0120-1
 23. English FA, Kenny LC, McCarthy FP. Risk factors and effective management of preeclampsia. *Integr Blood Press Control*. 2015 Mar 3;8:7-12. doi: 10.2147/IBPC.S50641. PMID: 25767405; PMCID: PMC4354613.
 24. Savage AR, Hoho L. Knowledge of pre-eclampsia in women living in Makole Ward, Dodoma, Tanzania. *Afr Health Sci*. 2016 Jun;16(2):412-9. doi: 10.4314/ahs.v16i2.9. PMID: 27605956; PMCID: PMC4994549.
