

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Exploring the Causes of Prevalent Preterm Delivery after Pre-Eclampsia in Pregnant Women Visiting Shariati Hospital of Bandar Abbas in 2011-2012.

Soghra Fallahi¹, Niloufar Aslavi^{2*}, Simin Norouzi², Aida Najafian³, and Amin Qanbarnejad⁴.

¹Ph.D. candidate of Molecular Medicine, Research Center of Molecular Medicine, Hormozgan University of Medical Sciences, Bandar Abbas, Iran.

²B.S. Student of Midwifery, Student Research Committee, Hormozgan University of Medical Sciences, Bandar Abbas, Iran.

³Infertility specialist, Hormozgan Center of (In) Fertility Research, Hormozgan University of Medical Sciences, Bandar Abbas, Iran.

⁴Ph.D. Candidate of Biological Statistics, Research Center of Social Factors in Health Promotion, Faculty of Healthcare education, Hormozgan University of Medical Sciences, Bandar Abbas, Iran.

ABSTRACT

Introduction: blood pressure disorders are common during pregnancy. Along with blood loss and infection they are considered as the three fatal factors which also account for a great many of preterm deliveries and pregnancy-related disabilities and mortalities. The prevalence rate of this problem in other countries has been reported to be a maximum of 10% and in Iran it is up to 7%. Due to the importance of this issue, the present research aims to investigate the underlying factors of preterm delivery due to pre-eclampsia in women visitors of Shariati hospital in Bandar Abbas in 2011 and 2012. Methodology: this descriptive/analytic study was a cross-sectional retrospective research conducted on 863 pregnant women (167 afflicted with preterm delivery after pre-eclampsia and 696 pregnant women diagnosed with preterm delivery for reasons other than pre-eclampsia). The data were gathered through a checklist containing such information as mother's age, blood type, pre-eclampsia history, systemic disease, preterm delivery pain, etc. SPSS 16 was used to analyze the data. T-test and Chi-squared test were employed as well. P-level was considered to be $<.05$. Findings: pregnant women afflicted with preterm delivery after pre-eclampsia had a higher average age than those afflicted with preterm delivery for reasons other than pre-eclampsia. The majority of women afflicted with pre-eclampsia belonged to the B+ blood group. Significant divergences were found in terms of these variables: pre-eclampsia history, preterm delivery pain, preterm rupture of the fetal membrane, vaginal bleeding, intrauterine growth restriction, mother's systemic diseases, mother's blood type, history of intrauterine death, amniotic fluid disorders. Conclusion: the probability of affliction with preterm delivery due to pre-eclampsia is increased with intrauterine growth restriction, history of intrauterine death and mother's background diseases. Since pre-eclampsia is accompanied by significant motherly and fetal consequences, timely therapeutic and preventive efforts and instructions for pregnant mothers on pre-natal healthcare can help to reduce severe consequences which threaten mother's and fetus' health.

Keywords: pre-eclampsia, preterm delivery, prevalence, Bandar Abbas

**Corresponding author*

INTRODUCTION

Pre-eclampsia is a key factor in high-risk pregnancies which threatens the health of many women all around the world especially in developing countries [1]. What is implied by pre-eclampsia is high blood pressure after the 20th week of pregnancy along with proteinuria. The latter means a production of over 300 milligrams of protein in one's 24-hour urine. Or it could be a ratio of urinary protein to creatinine which is more than or equal to 3. It could also be defined as the existence of 30 mg/dl constant protein in random urine samples [2]. Despite a great body of research in the past decades, why hypertension begins or is intensified during pregnancy is still unknown. Hypertension disorders are still the most unresolved problems in midwifery [3]. In Iran, pre-eclampsia is the second most prevalent cause of mother's mortality. It accounts for 18% of mothers' death [4]. Blood pressure disorders during pregnancy are very common. Along with blood loss and infection, these are the three fatal factors accounting for a main proportion of disability and mortality induced by pregnancy [3, 5-7]. The prevalence of this problem in other countries is reported to be at most 10% [8-10]. In Iran this rate has been reported to be as high as 7% [11, 12]. In nulliparous women, this rate is 6-7% while in the multiparous it is 3-4% (3). According to researchers, pre-eclampsia is a multi-variable disease and involves several underlying factors including prior history of pre-eclampsia, mother's low or high age, diabetes, chronic hypertension, nulliparity, inter-birth intervals (more than 6 years), prior abortion, high BMI, birth of twins, fetus sex, mother's migraine and RH blood type [13-17]. Generally speaking, there are many probable maternal consequences involved in pre-eclampsia among which are: DIC (Disseminated Intravascular Coagulation), intracranial bleeding, kidney failure, retinal detachment, pulmonary edema, liver rupture, placenta detachment and finally mother's death. The main cause of fetal disorder is lowered uterine-placental perfusion which would lead to oligohydramnios, IUGR (intrauterine growth restriction), placenta detachment, fetal distress, and finally fetal mortality [3]. Pre-eclampsia and eclampsia is perceived today as controllable and preventable diseases. Due to its relatively high prevalence and considerable maternal and fetal consequences, a timely diagnosis and treatment of pre-eclampsia can significantly affect mother's and fetus' health [18]. Therefore, the goal of this research is investigation of why preterm deliveries were so common after pre-eclampsia in women who visited Shariati hospital of Bandar Abbas in 2011-12.

METHODOLOGY

This descriptive/analytic study was retrospective and conducted in 2011-12 in the instructional/medical Shariati hospital of Bandar Abbas. Sample selection was done as a census. That is, it included all medical files that existed in the archive about 167 patients diagnosed with preterm delivery after pre-eclampsia. These patients met the least required criteria for a diagnosis with pre-eclampsia including: blood pressure $\geq 140/90$ mmHg after their 20th week of pregnancy, proteinuria ≥ 300 mg per 24 hours or $\geq 1+$ in their dipstick. They were selected as the treatment group while 696 patients who were diagnosed as having preterm delivery for reasons other than pre-eclampsia acted as the control group. In this study, from among all files recorded in 2011-12 those which contained incomplete information were excluded. The data were collected using a checklist containing demographic information as well as information related to pre-eclampsia and its symptoms. The variables investigated were mother's age, age of pregnancy, blood type, parity, baby's sex, pre-eclampsia history, vaginal bleeding, pre-term delivery pain, RPL, mother's systemic disease, amniotic fluid disorder, IUFD, IUFD history, IUGR, infertility, no. of fetus during the current pregnancy, PPROM, abruption (placenta detachment), placenta previa, cervical failure and uterine abnormality. The data were analyzed by SPSS 16. T-test and chi-squared test were used to analyze the data. Significance level was set at $<.05$.

Findings

The variables investigated in 863 women participants are indicated in table 1. The experimental group consisted of 167 pregnant women diagnosed with preterm delivery after pre-eclampsia. The control group consisted of 696 women with preterm delivery for reasons other than pre-eclampsia. According to the findings of this research, the treatment group (mean age= 28.3 ± 6.7) had a higher average age than the control group (mean age= 27.2 ± 5.9) ($p < .037$). According to the results of t-test and chi-squared test significant correlations existed between preterm delivery preceded by pre-eclampsia and these variables: mother's age ($P < 0.037$), preterm delivery pain ($P < 0.001$), mother's blood type ($P < 0.006$), PPROM ($P < 0.001$), pre-eclampsia history ($P < 0.001$), mother's systemic disease ($P < 0.005$), IUGR ($P < 0.004$), IUFD history ($P < 0.032$), amniotic fluid disorder

($P < 0.011$), vaginal bleeding ($P < 0.001$). In this study, the most significant variables that increase the probability of affliction with preterm delivery due to pre-eclampsia were IUGR, IUFD history and systemic disease.

Table 1: Distribution of the investigated variables in participants

P value	Reasons other than pre-eclampsia (control group)	Pre-eclampsia (experimental group)	variable	
0/037	27.2 ±5.9	28.3±6.7	age	
0/009	406(%58/4)	100(%59/9)	multiparous	parity
	289(%41/6)	67(%40/1)	nulliparous	
0/16800	6(%24/3)	38(%22/7)	A	Blood type
	187(%27/1)	66(%39/5)	B	
	43(%6/2)	4 (%2/3)	AB	
	292 (%42/3)	59 (%35/3)	O	
0/093	305(%44/5)	86 (%53/0)	female	sex
	380 (%55/5)	76 (%47/0)	male	
0/200	1(%0/3)	18 (%10/8)	Pre-eclampsia history	
0/001	67 (%9/6)	2 (%1/2)	VB	
0/774	3 (%0/4)	1 (%0/6)	RPL	
0/005	146 (%21/0)	52 (%31/1)	Systemic disease	
0/850	11 (%12/2)	6 (%3/6)	Disorder in Amniotic fluid volume	
0/032	16 (%2/3)	9 (%5/4)	IUFD history	
0/326	4 (%0/6)	0 (%0/0)	IUFD	
0/004	18 (%2/6)	12(%7/2)	IUGR	
0/139	36 (%5/2)	10 (%5/9)	yes	infertility
	660 (%94/8)	157 (%94/1)	no	
0/811	632 (%90/8)	152(%91/0)	monotocous	No. of babies
	64 (%9/2)	15 (%9/0)	Ditocous or polytocous	
0/001	341 (%49/0)	14 (%8/4)	PPROM	
0/433	54 (%7/8)	10 (%6/0)	Abrupton	
0/424	15 (%2/2)	2 (%1/2)	Previa	
0/166	22 (%3/2)	2 (%1/2)	Cervical failure	
0/064	10 (%1/4)	6 (%3/6)	Uterus abnormality	
0/001	443 (%63/6)	30 (%18/0)	PLP	

DISCUSSION

The only definitive treatment of pre-eclampsia is termination of pregnancy. The main goals of the therapy are: prevention of epileptic seizure, prevention of intracranial bleeding, inhibition of severe damage to other vital organs, and delivery of a healthy baby if the fetus is preterm. Since adding a few weeks to intrauterine life reduces the chance of fetal mortality and morbidity, physicians tend to postpone delivery [19]. Findings of this research revealed that pre-eclampsia history, PLP, PPROM, vaginal bleeding, IUGR, mother's systemic disease, BGRH, IUFD history and disorders in amniotic fluid volume significantly affect preterm delivery due to pre-eclampsia ($p < .037$). The majority of mothers afflicted with preterm delivery after pre-eclampsia were of a higher age average (mean age of the control group was 27.2% and the control group was 28.3%). Moreover, in a study conducted by Mitlendorf et al. the age above 35 was found to be correlated with pre-eclampsia [20]. However, in another research done by Salonen et al. no significant correlation was found between age and pre-eclampsia [10]. This correlation, though significant, in the present study did not show a wide divergence. Therefore, there is a need for further research with this respect. In 2011, Sharemi et al. realized that a history of abortion could lead to an increase in mild pre-eclampsia [21]. Similarly, in a review article conducted by Trostad, it was indicated that a history of abortion can cause certain degrees of protection against pre-eclampsia in later pregnancies [13]. However, no significant correlation was found in the present study between abortion and pre-term delivery after pre-eclampsia. Mother's awareness and adequate healthcare during pregnancy might play a key role in reducing pre-term delivery after pre-eclampsia. Due to the fact that the target hospital was an instructional hospital there was no further chance of analyzing the above-mentioned factors. Besides that, another limitation in this research was that due to its retrospective nature and collection of data through medical files, there was no access to such data as patients' occupation,

mother's education and healthcare during pregnancy. However, Al-Yasin et al. found out that a low level of healthcare during pregnancy is accompanied by more negative consequences. However, in patients who had regular healthcare during pregnancy maternal and fetal consequences have been reduced [22].

CONCLUSION

A safe and sound childbirth is the main goal of any medical team. In the present retrospective research, the causes of preterm delivery in Bandar Abbas were investigated. The probability of preterm delivery preceded by pre-eclampsia is increased with intrauterine growth restriction, history of intrauterine death and mother's background diseases. Since pre-eclampsia is accompanied by significant motherly and fetal consequences, timely therapeutic and preventive efforts and instructions for pregnant mothers on pre-natal healthcare can help to reduce severe consequences which threaten mother's and fetus' health.

Due to the great significance of mother's and fetus' health there is a need for further research in this realm. Prospective research should focus on instructing mothers on high-risk factors including pre-eclampsia such as: overt hypertension, proteinuria, headache, eyesight problems, epigastric pain, sudden weight gain (more than 2 pounds a week), addition to pre-natal visits in the third month which helps a fast diagnosis of pre-eclampsia.

REFERENCES

- [1] Reyes LM, García RG, Ruiz SL, Camacho PA, Ospina MB, Aroca G, et al. PloS One 2012;7(7):e41622.
- [2] Lim JH, Kim S, Lee SW, Park SY, Han JY, Chung JH, et al. J Assist Reprod Genet 2011;28(1):85-90.
- [3] Ronald S, Gibbs M, Beth Y, Karlan M, Arthur HM. Danforth's obstetrics and gynecology. Philadelphia: Lippincott Williams & Wilkins; 2003.
- [4] Bahadoran P, Zendehtel M, Movahedian A, Zahraee RH. Iranian J Nursing Midwifery Res 2010;15(3):120
- [5] Cunningham FG, Kenneth JL. Williams's obstetrics. Translated to Persian by: Ghazi Jahani B. Tehran: Golban Pub; 2001. p: 572-7.
- [6] Danesh M. [Obstetrics and special care. Tehran: Boshra Pub; 2000. p: 120-2.]Persian
- [7] Faramarzi M. [High risk pregnancy. Tehran: Boshra Pub; 2001. p: 80-3.]Persian
- [8] Cuunningham F, Cary F, Gant N, et al. William's obstetrics. 21th ed connetiut. Appelton and lang company; 2002: 567-90.
- [9] Leitch C, Cameron A, Walker J. Int J Obstetr Gynaecol 1997;104(8):917-22.
- [10] Ros HS, Cnattingius S, Lipworth L. American J Epidemiol 1998;147(11):1062-70.
- [11] Noroozi, A. Investigating maternal/fetal/infantile consequences in multiparous women visitors of Fateme Zahra Hospital in Bandar Abbas in 1992. An M.S. Thesis. Tehran: Faculty of Nursing and Midwifery. Shahid Beheshti University of Medical Sciences. 1992;60-61.
- [12] Pazande, F. Investigating the correlation of pregnancy under the age of twenty and pregnancy consequences in women visitors of instructional hospitals of Tabriz University of medical sciences. M.S. thesis. Tehran: Faculty of Nursing and Midwifery. Shahid Beheshti University of Medical Sciences. 1993;40-41.
- [13] Trogstad L, Magnus P, Stoltenberg C. Clin Obstetr Gynaecol 2011;25(3):329-42.
- [14] Duckitt K, Harrington D. BMJ 2005;330(7491):565.
- [15] Khalil MM, Alzahra E. Libyan J Med 2013;8(1).
- [16] Facchinetti F, Allais G, D'amico R, Benedetto C, Volpe A. European J Obstetr Gynecol Reprod Biol 2005;121(2):143-8.
- [17] Alpoim PN, de Barros Pinheiro M, Junqueira DRG, Freitas LG, das Graças Carvalho M, Fernandes APSM, et al. Mol Biol Rep 2013;40(3):2253-61.
- [18] Abramovicie D. preeclampsia-eclampsia: Management of high risk pregnancy, 4thed.USA; 1999:368.
- [19] Gary CF, Gant N, Leveno K, Gilstrap L, Hauth J, Wenstrom K. Williams obstetrics. New York: Mc Grow–Hill. 2005:823-9.
- [20] Mittendorf R, Lain K, Williams M, Walker C. Preeclampsia. The J Reprod Med 1996;41(7):491-6.
- [21] Sharemi H, Milani F & Zahiri Z. J Women Midwifery Infertility Iran 2012;16(69):1-8.
- [22] Al-Yasin A, ZA Asl, Aqahosseini M, Khademi A. Med Fac J 2002; 60(4):283-288.