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Original Article

Risk Factors of Early and Late Onset Preeclampsia

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ABSTRACT

Objectives. *Because early and late preeclampsia (PE) are thought to be different disease entities, our objective in this study to identify the differences in risk factors between early and late onset pre-eclampsia.* ***Methods.*** *A case series study was carried out involving 300 pregnancies with pre-eclampsia (123 early onset and 177 late onset) treated at Tripoli Medical Center, Libya, Tripoli between 1st January 2015 and 31st December 2015. The data were reviewed from antenatal and delivery records.* ***Results.*** *Factors were different between early and late onset of preeclampsia some of them were more significant to early onset and other more significant to late onset of preeclampsia and others were insignificant in onset of preeclampsia in our study. The risk factors that differ between early and late onset of pre-eclampsia were history of chronic hypertension to mother and history of high blood pressure in previous pregnancy, multiple pregnancy, maternal age ≥35 years were significant associated to early onset of preeclampsia while family history of chronic hypertension. Family history of diabetes mellitus, nulliparity and diabetic mother, maternal age <35 significant associated with late onset preeclampsia.* ***Conclusions****. These risk factors are of value to obstetricians in identifying patients at risk for pre-eclampsia and in implementing primary prevention.*

Keywords. Preeclampsia, Risk Factors, Early Onset, Late Onset, Libya

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INTRODUCTION

Preeclampsia (PE) is a major cause of maternal and perinatal morbidity and mortality, although there are still many unanswered questions, the pathophysiology of pre-eclampsia likely involves both maternal and fetal/placental factors [1]. Ten million women develop preeclampsia each year around the world. Worldwide about 76,000 pregnant women die each year from preeclampsia and related hypertensive disorders, and the number of babies who die from these disorders is thought to be on the order of 500,000 per annum [2].

In developing countries, a woman is seven times as likely to develop preeclampsia as a woman in a developed country. Preeclampsia is characterized by elevated blood pressure and proteinuria or involvement of other organs in an exaggerated systemic inflammation [3]. In industrialized countries, preeclampsia complicates approximately 3-5% of pregnancies and represents one of the most common causes of maternal mortality and severe maternal morbidity. Early detection of PE would allow for planning of appropriate monitoring and for clinical management, following early identification of

complications. There currently is no single reliable, cost-effective screening test for preeclampsia [4].

The serum uric acid level once was used as an indicator of preeclampsia but has been found to lack sensitivity and specificity as a diagnostic tool [5]. A baseline laboratory evaluation should be performed early in pregnancy in women who are at high risk for preeclampsia. Tests should include a hepatic enzyme level, a platelet count, a serum creatinine level, and a 12- to 24-hour urine collection for total protein measurement. Once the diagnosis of preeclampsia has been made,[5] in women who have preeclampsia with no suspected progression, all laboratory tests should be conducted weekly. If progression of eclampsia is suspected, the tests should be repeated more frequently.

Recent meta-analyses have suggested that, provided treatment is started at an early (<16 weeks') gestation, there is a significant reduction in early-onset PE and that this is associated with a reduction in prevalence of perinatal mortality and morbidity [6]. The ais of this study was to identify the differences in risk factors between early and late onset pre-eclampsia.

METHODS

Study design

A case series study conducted at the Department of Obstetrics and Gynecology, University hospital Tripoli, Libya, which providing tertiary care services and one of main teaching hospital in Libya. The antenatal and delivery records of all pregnant women with gestational age of 20 weeks or more and estimate fetal weight of ≥500 g delivered (regardless of live birth or stillbirth) at Tripoli medical center from 1st January 2015 to 31st December 2015 were reviewed. Exclusion criteria included abortion, hydatidiform mole, pregnancies complicated with chromosomal or structural anomalies and birth before arrival.

Study process

Data were divided into two groups, Cases were diagnosed as mild pre-eclampsia, severe pre-eclampsia, eclampsia, or superimposed pre-eclampsia. Cases were divided into two groups, early onset and late onset. The diagnosis of preeclampsia was made using the current American College of Obstetricians and Gynecologists (ACOG) guidelines [7], these guidelines define preeclampsia as sustained pregnancy-induced hypertension with proteinuria. Hypertension was defined as sustained blood pressure readings of >140/90 mmHg (with reading taking place >6 hours apart). ACOG defines proteinuria as urine protein concentrations of >30 mg/dL (or 1+ on a urine dipstick) on two or more random specimens collected > four hours apart. It has recently been suggested that early (<34 completed weeks gestation) and late (>34 completed weeks gestation), onset preeclampsia may have different etiologies. Gestational age was calculated from the time elapsed since the first day of the last menstrual period, or calculated from first-trimester ultrasonography if the last menstrual period was uncertain. Data were collected regarding personal information, obstetric information, antenatal care, medical history, and pregnancy outcome. The following risk factors were evaluated: age, parity, gestational age, blood pressure at first visit, pre-pregnancy weight, body mass index (underweight: body mass index [normal: BMI 20–24.9 kg/m2; overweight: BMI 25.0–29.9 kg/m2; obese: BMI ≥ 30 kg/m2), medical illness and family history (hypertension, diabetes), previous history of pre-eclampsia, history of gestational hypertension, history of kidney disease, multiple pregnancy.

Statistical analysis

Data were presented as mean ± standard deviation and percentage and divided in to groups' early and late onset of preeclampsia. Chi-square test was used in analysis to evaluate the association of risk factors with each pre-eclampsia group. P value at or below 0.05 it means that the difference that observed in the study is due to chance, and the difference is significant, as the P value get small the test is more significant.

RESULTS

We observed there is significant association between risk factors and the disease while weight of mother in our study was insignificant association with p-value <0.442 p-value >0.05in despite majority of both preeclampsia group at BMI (25_19.9) 68% for early onset 71.7% for late.

When we comparing the occurrence of these factors between two preeclampsia groups, we found factors that seems to be more related in late onset of preeclampsia than early onset was maternal age <35-year (67.8%), Nulliparity (39%), diabetic mother (gestational or pregestational) (62.1%) and family history of diabetic (63.8%) family history of hyper tension (91%) as shown in Table 1.

Tables 1. Distribution of risk factors of preeclampsia & significantly onset of the disease by using chi-square test & p-value at University Hospital Tripoli, Libya

Risk factors	Early onset (N %)	Late onset (N %)	Chi-square	p-value
Maternal age >=35 year <=35 year	43(34.9%) 80 (65%)	120(67.7%) 57(32.2%)	31.537	0.000
Nalli-parity	13(10.5)	69(38.9)	111.895	0.000
Chronic hypertension Yes No	70(56.9) 53(43)	12(6.7) 165(93.2)	91.821	0.000
Diabetes Mellitus Yes No	49(39.8) 74(60.1)	110(62.1) 67(37.8)	14.500	0.000
F/H of hypertension Yes No	31(25.2) 92(74.7)	161(90.9) 16(9)	136.195	0.000
F/H of diabetes Yes No	53(43) 70(56.9)	113(63.8) 64(37.8)	12.645	0.000

F/H= Family History

While history of high blood pressure in previous pregnancy (69.9%), chronic hyper tension to the mother (56.9%), history of renal disease (18.7%), maternal age ≥35 year (65%) and multiple pregnancy (30.9%) more related to early onset than late onset of preeclampsia as shown in Table 2.

Tables 2. Distribution of risk factors of preeclampsia & significantly onset of the disease by using chi-square test & p-value at University Hospital Tripoli, Libya

Risk factors	Early onset (N %)	Late onset (N %)	Chi-square	p-value
Maternal BMI Normal BMI BMI (25_29.9) BMI>30	8(6.5) 84(68.2) 31(25.2)	6(3.3) 127(71.7) 44(24.8)	1.635	0.442
Multiple pregnancy Yes No	38(30.9) 171(96.6)	6(3.4) 85(69.1)	43.865	0.000
H/O high BP in previous pregnancy Yes No	86(69.9) 37(30.0)	64(36.1) 113(63.8)	33.085	0.000
H/O renal diseases Yes No	23(18.7) 100(81.3)	4(2.3) 173(97.7)	23.946	0.000

H/O= History of

DISSCUSION

There were many studies evaluating the risk factors of early and late onset of pre-eclampsia.[8] However, the results from this study of early and late onset preeclampsia case groups not support the position held by Huppert [9] who recently noted no clear difference between the early and late onset preeclampsia. Obesity is perhaps the most consistently reported modifiable risk factor of preeclampsia. Mahomed et al. reported that Zimbabwean women with preeclampsia had a higher BMI (27.6±4.4 kg/m2) compared with normotensive women (25.2±3.8 kg/m2) [10]. Mittendorf et al. reported a 2.7-fold increased risk of preeclampsia in obese women compared to women with a pre-

pregnancy BMI between 18–30 kg/m2 [11]. We observed no statistically significant trend of increased preeclampsia risk with increasing BMI in despite majority of both preeclampsia group at BMI (25_19.9). Maternal age at extremes (<20 and >40 years) was identified as a risk factor of preeclampsia in a Saudi Arabian population [12]. Advanced maternal age (>35 years) had also been shown in other populations to be associated with increased risk of preeclampsia [13]. Similar patterns of risk were observed in this study, where young (<35years) and older (≥35years) women were at an increased risk of preeclampsia regardless of whether the condition was classified as early or late onset. The strength of the present study was the large number of cases in early and late onset pre-eclampsia. Thus, we could compare and identify the difference in the risk factors between these groups. The limitation of this study was the small number of smokers and the small number of pregnant women who used calcium medication during pregnancy. Thus, we could not assess the effect of these factors.

CONCLUSION

There were risk factors differences between early and late onset pre-eclampsia. These risk factors are valuable to obstetricians for identifying patients at risk for pre-eclampsia and for implementing primary prevention.

Conflict of Interest

There are no financial, personal, or professional conflicts of interest to declare.

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