International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Shankar P et al. Int J Reprod Contracept Obstet Gynecol. 2019 Feb;8(2):548-551
www.ijrcog.org

pISSN 2320-1770 | eISSN 2320-1789

DOI: http://dx.doi.org/10.18203/2320-1770.ijrcog20190282

Original Research Article

Maternofetal outcomes in early versus late onset pre-eclampsia: a comparative study

Poornima Shankar, Kavitha Karthikeyan*, Amrita Priscilla Nalini, Sindhura M., Gowtham Kim

Department of Obstetrics and Gynecology, Chettinad Academy of Research and Education, Kelambakkam, Tamil Nadu, India

Received: 28 November 2018
Accepted: 29 December 2018

***Correspondence:**
Dr. Kavitha Karthikeyan,
E-mail: kavikarthik16@yahoo.com

ABSTRACT

Background: Preeclampsia is being increasingly recognized as two different entities: early-onset preeclampsia occurring at less than 34 weeks of gestation, and late-onset disease occurring at 34 or more weeks of gestation. Early-onset and late-onset pre-eclampsia are found to have different implications for the mother and neonate. The aim of this study is to compare the risk factors, maternal and fetal outcomes in early (<34 weeks) versus late (≥34weeks) onset preeclampsia.

Methods: 208 patients diagnosed with pre-eclampsia in Chettinad Academy of Research and Education over a period of three years (From January 2014 to December 2016) were retrospectively studied. Patients were classified as early onset and late onset pre-eclampsia based on the gestational age of onset. Data on risk factors, maternal and fetal outcomes were collected and analyzed using Chi Square and Fisher's test and compared.

Results: The overall preeclampsia rate was 6.3%. Early onset and late onset were 34.6% and 65.3% respectively and the rate increased with increasing gestational age.35.3% of patients with late onset preeclampsia and 55.6% patients of early onset type required more than one drug which is a statistically significant difference. Proteinuria more than 3gm/l/day was significantly more in late onset preeclampsia than in early onset preeclampsia. 55.5% of patients with early onset pre-eclampsia required MgSO4 when compared to 17.4%. There was no statistically significant difference in the rate of caesarean section (61.1% vs 73.5%). Altered coagulation profile was significantly more in early onset preeclampsia (11.1%). The incidence of oligohydramnios, SGA and low APGAR at 5 minutes of birth were significantly high in early onset pre-eclampsia when compared to late onset type.

Conclusions: Patients with early onset pre-eclampsia are found to have significantly higher rates of specific maternal and fetal morbidity when compared to the late onset type.

Keywords: Early onset, Fetal outcome, Late onset pre-eclampsia, Maternal outcome

INTRODUCTION

Hypertensive disorders complicate 5 to 10% of all pregnancies. Pre-eclampsia is present in 2 to 8% of women worldwide.[1] It is still a leading cause of maternal morbidity and mortality. Hypertensive disorders remain as the second direct cause for maternal death worldwide.[2] Indeed they remain among the most significant and intriguing unsolved problems in obstetrics.

Preeclampsia is a pregnancy specific syndrome which can virtually affect every organ system and is being increasingly recognized as two different entities: early-onset preeclampsia occurring at less than 34 weeks of

gestation, and late-onset disease occurring at 34 or more weeks of gestation.[3]

The pathophysiology of the two diseases is also found to be different. A few publications have discussed the associated maternal morbidities, perinatal outcomes, clinical and laboratory features of both the pre-eclampsia types.[4-6] In general, in a population there is representation of both the forms with majority of them present with late onset type and minority with early onset type.[7]

Although they may share some risk factors and overlapping presenting features, early-onset and late-onset pre-eclampsia are found to have different implications for the mother and neonate.

However, the consequences of early-onset compared with late-onset preeclampsia on maternal health have not been adequately quantified in South Indian population. Authors therefore intended to carry out a study to examine and compare the risk factors and maternal and fetal outcome in early-onset vs late-onset preeclampsia. Also, this study will help to optimise the prognosis and management of both the types of pre-eclampsia.

The aim of the present study was to compare the clinical differences and differences in maternal and fetal outcomes in both the types of pre-eclampsia.

METHODS

It was a retrospective observational study.

Inclusion criteria

- Patients with Pre-eclampsia
- Eclampsia
- Any age, parity satisfying the criteria for pre-eclampsia
- Chronic hypertension with super imposed pre-eclampsia.

Exclusion criteria

- Women with
- Preexisting cardiac disease
- Preexisting diabetes
- Preexisting renal disease
- Preexisting liver disease
- Chronic hypertension without proteinuria.

Definition of exposure: Blood pressure more than or equal to 140/90 mm Hg after 20 weeks of gestation with proteinuria≥300 mg/24 hours or ≥1+ in dipstick.[8]

Women with a diagnosis of preeclampsia (including eclampsia, superimposed pre-eclampsia) during any pregnancy visit or hospitalization in Chettinad Academy of Research and Education were identified and studied retrospectively by analysis of case records and outpatient database over a period of 3 years (From January 2014 to December 2016). Patients were classified as early onset and late onset pre-eclampsia based on the gestational age of onset.

Data on risk factors, maternal (massive proteinuria, drug requirement, MgSO4 usage, Rates of Caesarean sections, Coagulation profile, RFT, LFT, requirement of general anaesthesia) and fetal outcomes (incidence of oligohydramnios, GA and low 5 minutes APGAR) were collected and analysed.

Statistical analysis

The data collected was analyzed using Chi Square and Fisher's test and compared. The significance of difference in maternal and fetal outcomes in early onset and late onset type was determined based on the calculation of p value. P-value less than 0.05 was considered significant.

RESULTS

The overall preeclampsia rate was 6.3%. Late onset pre-eclampsia was more prevalent than early onset type. Early onset and late onset were 34.6% and 65.3% respectively and the rate increased with increasing gestational age.

Table 1: Risk factors comparison between early and late onset pre-eclampsia.

Risk factors	Early onset pre-eclampsia	Late onset pre-eclampsia
Age (<30yrs)	64 (34.78%)	120 (65.21%)
Primi parity	40 (32.26)	84 (67.74%)
Male fetus	20 (17.85%)	92 (82.14%)
Blood group (A+ve)	10 (50%)	10 (50%)

Younger age (<30 years), primiparity and male fetus was found to have association with late onset pre-eclampsia than early onset type. Late onset pre-eclampsia was most associated with younger age, primiparity and male fetus when compared with early onset type (Table 1).

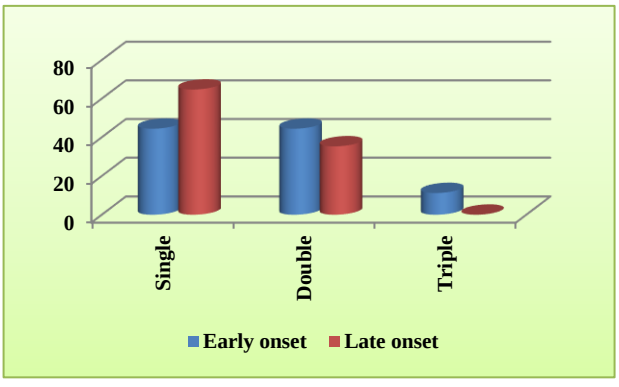

Figure 1: Distribution of drug usage in preeclampsia.

More than one drug requirement for blood pressure control was significantly more in early onset than late onset pre-eclampsia.35.3% of patients with late onset preeclampsia and 55.6% patients of early onset type required more than one drug which is a statistically significant difference (Figure 1).

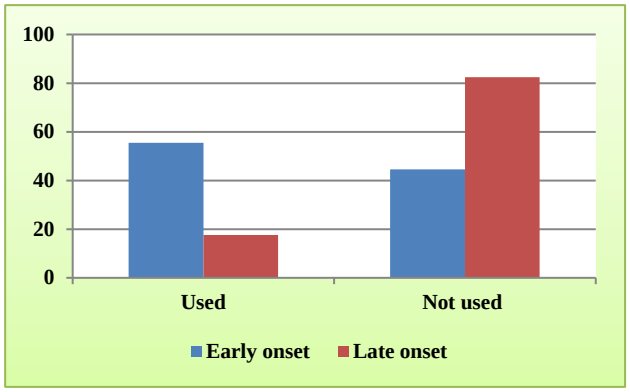

Figure 2: Distribution of MgSO4 usage.

Proteinuria more than 3gm/l/day was significantly more in late onset preeclampsia than in early onset preeclampsia. 55.5% of patients with early onset pre-eclampsia required MgSO4 when compared to 17.4% of those with late onset type which is statistically significant, deranged coagulation profile was more commonly associated with early onset than late onset type (Figure 2).

Table 2: Coagulation profile changes comparison between early onset and late onset type

Coagulation profile	No. of patients	<34 weeks (%)	>34 weeks (%)
Normal	196	64 (88.9)	132 (97.1)
Deranged	12	8 (11.1)	4 (2.9)
Total	208	72	136

There was no statistically significant difference in the rate of caesarean section (61.1% vs 73.5%). Altered coagulation profile was significantly more in early onset preeclampsia (11.1%) whereas there was no significant difference in LFT and RFT (Table 2). 18.2% of early onset type and 8% of late onset type required general anaesthesia during caesarean delivery.

Table 3: Fetal outcomes comparison between early and late onset pre-eclampsia.

NICU admissions	Early onset	Late onset
Oligohydramnios	16 (66.7%)	8 (33.3)
SGA	48 (66.7%)	24 (33.3)
5 min Apgar <7	24 (66.7%)	12 (33.3)

The presence of oligohydramnios, small for gestational age foetuses and low APGAR at 5 minutes of birth was significantly more in early onset pre-eclampsia than late onset type (66.6% vs 33.3%) (Table 3). Adverse fetal outcomes were more commonly associated with early onset than late onset type.

DISCUSSION

Present study has shown that there is an increase in pre-eclampsia rates and early onset pre-eclampsia has a significantly increased risk of severe maternal and fetal morbidity. But there was no significant difference in the rate of operative morbidity in terms of caesarean deliveries. The recent increase in older maternal age and pre-pregnancy weight could have contributed to the increase in pre-eclampsia rates. Increase in early onset disease is consistent with temporal increase in chronic hypertension among pregnant women. Chronic hypertension is more strongly associated with early onset than late onset pre-eclampsia.[9]

Early onset pre-eclampsia poses a great challenge to treating clinicians in terms of need to balance the risk of perinatal morbidity due to early delivery with the risk of worsening maternal condition associated with expectant management. Meta analyses have shown that expectant management is associated with lower incidence of neonatal morbidity with no significant difference in maternal outcomes.[10] Hence, early interventions for maternal reasons in early onset type could have led to significant fetal morbidity in present study.

Compared with previous studies in this topic

Lisonkova S, Joseph KS et al, conducted a population based study in 2013 and concluded that the overall pre-eclampsia rate was 3.1%and the rates increased with increasing gestation whereas in present study the pre-eclampsia rate was 6.3%.Risk factors common to both the types included older maternal age and male fetus.[9] In present study, Younger age, primiparity were more commonly associated with late onset type which was the same as that study.

Sabr Y, Mayer C, Young C, Skoll A et al, studied in 2014 the maternal morbidity associated with early-onset and late-onset preeclampsia in which early onset conferred a substantially higher risk of cardiovascular, respiratory, CNS, renal, hepatic and other morbidity.[11] In present study there was a higher risk of coagulation abnormality associated with early onset type whereas eclampsia rate was higher in late onset type, whereas the abnormalities in renal and liver parameters did not show any statistically significant difference between both the types

Madazli R, Yuksel MA, Imamoglu M, Tuten A, Oncul M, Aydin B, studied the perinatal outcomes comparison between the two groups in which the incidences of small-for-gestational age, oligohydramnios, Apgar score<7 at 5 min were significantly higher in women with early onset pre-eclampsia when compared with late onset pre-

eclampsia ($p< 0.01$) which was the same in present study.[12]

A study by Elmugabil A, Rayis DA, Ahmed MA, Adam I, Gasim GI Et Al showed patients with O blood group has a higher risk of pre-eclampsia.[13] In contrast, present study showed majority of patients with pre-eclampsia had A positive blood group.

As present study is a retrospective analysis, it has its own notable limitations. Gestational age of onset of pre-eclampsia was determined based on hospital database records. This study was conducted in a tertiary care hospital. Hence more population based larger studies are needed. The strength of the study is that it includes a cohort sample of specific geographic area which is representative of a regional population in which study on this area is sparse. The gestational age was based on time of onset rather than time of delivery. Present study has quantified the effect of early and late onset pre-eclampsia on maternal and fetal morbidity.

CONCLUSION

Early onset and late onset preeclampsia may share some risk factors. But both the types lead to significantly different outcomes. Patients with early onset pre-eclampsia are found to have significantly higher rates of specific maternal and fetal morbidity when compared to the late onset type. Hence, both preeclampsia types should be treated as different entities from a prognostic perspective.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Khodzhaeva ZS, Kogan YA, Shmakov RG, Klimenchenko NI, Akatyeva AS, Vavina OV, et al. Clinical and pathogenetic features of early-and late-onset pre-eclampsia. J Maternal-Fetal Neonat Med. 2016;29(18):2980-6.
2. Say L, Chou D, Gemmill A, Tunçalp Ö, Moller AB, Daniels J, et al. Global causes of maternal death: A WHO systematic analysis. Lancet Global Health. 2014;2(6):e323-33.
3. Von Dadelszen P, Magee LA, Roberts JM. Subclassification of preeclampsia. Hypertension Preg. 2003;22(2):143-8.
4. Chen Y, Huang Y, Jiang R, Teng Y. Syncytiotrophoblast-derived microparticle shedding in early-onset and late-onset severe pre-eclampsia. Int J Gynecol Obstet. 2012;119(3):234-8.
5. Kucukgoz Gulec U, Ozgunen FT, Buyukkurt S, Guzel AB, Urunsak IF, Demir SC, et al. Comparison of clinical and laboratory findings in early-and late-onset preeclampsia. J Maternal-Fet Neonat Med. 2013;26(12):1228-33.
6. Raymond D, Peterson E. A critical review of early-onset and late-onset preeclampsia. Obstet Gynecol Survey. 2011;66(8):497-506.
7. Ogge G, Chaiworapongsa T, Romero R, Hussein Y, Kusanovic JP, Yeo L, et al. Placental lesions associated with maternal underperfusion are more frequent in early-onset than in late-onset preeclampsia. J Perinatal Med. 2011;39(6):641-52.
8. Cunningham FG, Williams J Whitridge. Williams textbook of obstetrics 23rd edition New York: McGraw-Hill;2010:707.
9. Lisonkova S, Joseph KS. Incidence of preeclampsia: risk factors and outcomes associated with early-versus late-onset disease. Am J Obstet Gynecol. 2013;209(6):544-e1.
10. Churchill D, Duley L, Thornton J, Jones L. Interventionist versus expectant care for severe pre-eclampsia between 24-and 34-weeks' gestation. Cochrane Library. 2013;7:CD003106.
11. Lisonkova S, Sabr Y, Mayer C, Young C, Skoll A, Joseph KS. Maternal morbidity associated with early-onset and late-onset preeclampsia. Obstet Gynecol. 2014;124(4):771-81.
12. Madazli R, Yuksel MA, Imamoglu M, Tuten A, Oncul M, Aydin B, et al. Comparison of clinical and perinatal outcomes in early-and late-onset preeclampsia. Archives Gynecol Obstetr. 2014;290(1):53-7.
13. Elmugabil A, Rayis DA, Ahmed MA, Adam I, Gasim GI. O blood group as risk factor for preeclampsia among Sudanese women. Open access Macedonian J Med Sci. 2016;4(4):603.

Cite this article as: Shankar P, Karthikeyan K, Nalini AP, Sindhura M, Kim G. Maternofetal outcomes in early versus late onset pre-eclampsia: a comparative study. Int J Reprod Contracept Obstet Gynecol 2019;8:548-51.