Complications in Premature Labor Between Severe Preeclampsia and Normal Pregnancies

1Zahra Fardiazar, 1Mitra Ramin, 1Elahi Olad Saheb Madarek, 1Simin Atashkhoei, 1Reza Torab and 2Mohamad Goldust
1Tabriz University of Medical Sciences, Tabriz, Iran
2Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran

Abstract: Severe Preeclampsia may lead to liver and renal failure, Disseminated Intravascular Coagulopathy (DIC) and Central Nervous System (CNS) abnormalities. This study aimed at comparing of infant complication in premature labor between severe preeclampsia and normal pregnancies. In this analytical-descriptive study, one hundred pregnant with severe preeclampsia and premature delivery due to severity of preeclampsia were compared with one hundred cases of premature delivery without preeclampsia to study neonatal fate. The understudy subjects were divided into five age groups of 27-28, 29-30, 31-32, 33-34, 35-36 weeks considering type of delivery, neonate features and neonatal complications related to premature delivery. Mean age of mothers of normal delivery group was 27.28±5.42 and mean age of mothers of the second group was 30.56±5.86. There was statistically meaningful difference between two groups of delivery regarding patients’ systolic blood pressure (p<0.001). The study made it clear that there was not statistically meaningful difference between two groups of delivery regarding fetus age (in weeks) at the time of delivery (p = 0.456). According to findings of this study, neonatal complications and mortality is high in preeclampsia due to stressful conditions created for the fetus.

Key words: Severe preeclampsia, complication, pregnancy, premature

INTRODUCTION

Preeclampsia is a triad set of edema, hypertension and proteinuria mainly occurs in nullipara after 20 weeks of pregnancy and near pregnancy term (Goldust et al., 2011; Golfurushan et al., 2011; Ozkan et al., 2011; Sadeghpour et al., 2011). It is diagnosed via decrease of limbs blood supply in addition to vasospasm and activation of endothelium (Goldust et al., 2013a; Veas et al., 2011). Results of evaluating uterine and fetal-placental arteries using Doppler velocimetry demonstrated that ratio of systolic stream to diastolic one in uterine arteries increases with preeclampsia in some women (Chung et al., 2006; Goldust et al., 2013b; Mohebbipour et al., 2012). Factors effective in preeclampsia include no records of previous delivery, negro race, mother’s age less than 20 or more than 35 years old, social-economical condition (low level), multiple birth pregnancy, hydaticidiform mole, polyhydramnios, fetus unsafe hydrops, diabetes, chronic hypertension and renal background disease (Goldust et al., 2013c; Sibai, 2006). Clinical findings were: (A) Lower edema is a natural finding in pregnancy but non-lower edema of face and hands while waking up at morning is regarded as a disease, (B) Hypertension is the most important criterion in diagnosing preeclampsia and defined as blood pressure equal to or more than 140/90 mmHg and (C) Proteinuria is the last created symptom and regarded as fetus risk sign in preeclampsia (Banhidy et al., 2011; Mbah et al., 2011; Newman et al., 2003). It is defined as excretion of 300 mg or more protein in a 24 h sample of urine. Severe preeclampsia is accompanied by following listed criteria: systolic pressure equal to or more than 160 mmHg, diastolic pressure equal to or more than 110 mmHg, 2+ or more stable proteinuria, existence of 2 g or more protein in a 24 h urine sample, headache, dystopia, epigastria pain, oliguria, increase of serum ketamine, thromboeytopenia, hyperbilirubinemia, significant increase of liver enzymes, lung edema and IUGR (Jerikus et al., 2002; Nassar et al., 1998; Sadighi et al., 2011; Vafaei et al., 2012). Preeclampsia complications may be accompanied with premature delivery and fetal complications resulting from premature (Goldust et al., 2012, Milan et al., 2011; Spinillo et al.,...
The study tries to compare fetal-neonatal complications including apgar score, neonate respiratory distress disease, cerebral hemorrhage, neonatal infection, hospitalization duration and conditions while releasing from hospital in two similar age groups, i.e., pregnancies with severe preeclampsia (pregnancy poisoning) and normal pregnancies.

MATERIALS AND METHODS

In this analytical-descriptive study, one hundred pregnant women hospitalized in Alzahra hospital, Tabriz University of Medical Sciences because of severe preeclampsia and premature delivery due to severity of preeclampsia were compared with one hundred cases of premature delivery without preeclampsia to study neonatal fate. Inclusion criteria were severe preeclampsia, single birth pregnancy, lack of known fetus abnormalities and pregnancy age between 26-37 weeks. Women with the above mentioned criteria were selected and their medical and personal particulars were registered in questionnaire after describing research method and satisfying the patients. This study was approved by ethic committee of Tabriz University of Medical Sciences. The study subjects were divided into five age groups of 27-28, 29-30, 31-32, 33-34, 35-36 weeks considering type of delivery, neonate features and neonatal complications related to premature delivery. The sampling continued until selecting 20 subjects for every group. To compare complications, 100 cases (20 for each group) with premature delivery due to reasons other than severe preeclampsia were selected as members of the control group. The selection continued until completing the sample. In case of observing fetal abnormality after delivery, the case will be excluded. Personal and medical conditions of subjects of both groups as well as neonatal complications were compared using SPSS 16 software, descriptive statistical methods, t-test and Chi-square test. p-value less than 0.05 were considered significant.

RESULTS

Mean age of mothers of normal delivery group was 27.28±5.42. The youngest was 18 and the oldest mother was 41 years old. While, mean age of mothers of the second group was 30.56±5.86. The youngest was 17 and the oldest mother was 45 years old. The results demonstrate that there is statistically meaningful difference considering mothers’ age in two groups such that mothers’ age in preeclampsia group was more than premature delivery group (p<0.001). There is not statistically meaningful difference between number of previous pregnancies in two groups of delivery (p = 0.287). Results of t-test for independent groups demonstrate that there is no statistically significant difference between two groups of delivery considering pregnancy age (in weeks) (p = 0.442). Results of t-test for independent groups show that there is statistically meaningful difference between two groups of delivery regarding patients’ systolic blood pressure such that patients’ systolic blood pressure in preeclampsia delivery group was more that premature delivery group (p<0.001). Additionally, results suggest that there is statistically significant difference between two groups of delivery considering patients’ diastolic blood pressure such that patients’ diastolic blood pressure in preeclampsia delivery group was more that premature delivery group (p<0.001). The study makes it clear that there is not statistically meaningful difference between two groups of delivery regarding fetus age (in weeks) at the time of delivery (p = 0.456). There is statistically meaningful difference between two groups of delivery regarding neonate apgar during the first minute such that neonates apgar score in premature delivery group was more that first minute apgar score of preeclampsia delivery group (p = 0.002). But, the results demonstrate that there is no statistically significant difference in two delivery groups regarding neonate apgar at the fifth minute (p = 0.076). There is not statistically meaningful difference between two groups of delivery regarding neonates’ birth weight such that neonates’ birth weight in the premature delivery group was more than preeclampsia delivery group (p = 0.016). There is statistically meaningful difference between two groups of delivery regarding number of hospitalization days such that number of hospitalization days in preeclampsia delivery group was more that premature delivery group (p<0.001) (Table 1).

<table>
<thead>
<tr>
<th>Index</th>
<th>Preeclampsia</th>
<th>Normal pregnancy</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>30.56±5.86</td>
<td>27.28±5.42</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Previous pregnancy</td>
<td>0.72±0.93</td>
<td>0.58±0.84</td>
<td>0.287</td>
</tr>
<tr>
<td>Pregnancy age</td>
<td>31.63±2.90</td>
<td>31.93±2.48</td>
<td>0.442</td>
</tr>
<tr>
<td>Systolic blood pressure</td>
<td>160.58±18.45</td>
<td>111.89±11.72</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Diastolic blood pressure</td>
<td>101.45±11.50</td>
<td>72.00±9.50</td>
<td>&lt;0.001</td>
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<tr>
<td>Fetus age (week)</td>
<td>31.67±2.920</td>
<td>31.97±2.510</td>
<td>0.456</td>
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<tr>
<td>Fetus apgar (1 min)</td>
<td>6.7±2.7300</td>
<td>7.74±2.090</td>
<td>0.002</td>
</tr>
<tr>
<td>Fetal apgar (5 min)</td>
<td>8.44±2.7400</td>
<td>9.17±1.750</td>
<td>0.076</td>
</tr>
<tr>
<td>Umbilical cord PH</td>
<td>7.21±0.0760</td>
<td>7.22±0.080</td>
<td>0.762</td>
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<tr>
<td>Birth weight (g)</td>
<td>1649.70±621.27</td>
<td>1805.70±460.7</td>
<td>0.016</td>
</tr>
<tr>
<td>Hospital stay (day)</td>
<td>12.04±15.06</td>
<td>7.92±4.880</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Values are Mean±SD
DISCUSSION

In the present study, the preeclampsia group subjects were meaningfully older than the control group. Preeclampsia is more prevalent in women of two sides of age range (high and low) and nullipara. According to the results, prevalence of pregnancy hypertension was 14.1% in primigravida and 5.7% in multipara women. Due to chronic blood pressure, added preeclampsia increases at high ages. Additionally, first contact of maternal tissues with placental villous is one of the possible causes of preeclampsia leading to vasospasm and preeclampsia events. For this reason, the disease is more seen in primigravida women (Tuck et al., 1988). In the study, caesarean rate in the group with severe preeclampsia is higher that members of control group and also higher than hospital annual statistic, i.e., 32%. In the study conducted by Morgan et al. (1994) caesarean rate was high in preeclampsia group. In this study, neonate’s apgar mean was 7 and 9 during first and fifth minutes. First minute apgar in preeclampsia was lower than control group. In evaluating blood gases of the neonates of two groups, no difference was observed regarding umbilical cord PH. Apgar score indicates neonate general status and its need to resuscitation. At neonate’s lower age, apgar is lower (North et al., 1999). Due to premature deliveries of the study, mean of first minute apgar is lower than 7. Lifetime of Alzafra center is 27-28 weeks of pregnancy. In some centers, 24 weeks and in other centers, 26 weeks of pregnancy is defined as neonate lifetime age (Irgens et al., 2001). In Morgan’s study, umbilical cord PH of pregnancy with high blood pressure was less than groups without high blood pressure (Morgan et al., 1994). In women with preeclampsia, low apgar of preeclampsia delivery group may indicate mother or neonate’s stress. But, neonatal asphyxia is ignored in this group due to neonate acceptable PH. In a study conducted by Nisell et al. (2000) falling of neonates’ umbilical cord PH and NICU hospitalization rate in preeclampsia neonates were not high. Preeclampsia leads to relative decrease of placenta-fetal blood supply because of maternal arteries vasospasm (Buchbinder et al., 2002). According to the reports, Intra-uterine Growth Restriction (IUGR) is more common in neonates with preeclampsia (Jenkins et al., 2002). Considering number of hospitalization days in the present study, it is more in preeclampsia group than the premature delivery group. However, there is not statistically meaningful difference. Additionally, hyaline membrane disease, respiratory distress and icteria in preeclampsia group is significantly higher that the control group (p<0.001). There was no statistically meaningful difference between two groups considering complications of cerebral hemorrhage, infection and neonate’s mortality (p>0.05) neonates’ mortality rate was 15.6% in the premature delivery and 22% in preeclampsia group. Most mortality was observed in age groups of 27-30 weeks. In the study conducted by Gray et al. (1997) mortality rate of 24-29 week neonates was 286 in 1000. In their study, enterocolitis necrotizante in the preeclampsia was more than other groups with causes leading to premature delivery. In the study, no relation was found between neonatal fate and factor causing premature delivery. In the study of Gaugler-Senden et al. (2006) mortality rate in severe and premature (before 24 weeks) preeclampsia was 82% (Gaugler-Senden et al., 2006). High rate of mortality can be attributed to young age of pregnancy in which severe preeclampsia is appeared (Srp et al., 2002). In this study, we have considered older than 27-week cases, so, mortality rate is low and about 50%. Neonate mortality is higher in preeclampsia because of placental insufficiency and delivery. In more severe preeclampsia, neonatal complications are more than moderate preeclampsia. Also, in preeclampsia cases, neonatal mortality is higher than the preeclampsia added to pregnancy blood pressure.

CONCLUSION

According to findings of this study, neonatal complications and mortality is high in preeclampsia due to stressful conditions created for the fetus. Special complications related to premature delivery include hyaline membrane disease, fetus distress and icteria in neonates of premature delivery in preeclampsia group is more than control one. So, it seems that corticosteroid should be prescribed to treat lung of mothers and neonates. It is in contrary to the previous findings based on usefulness of stressful conditions resulted from preeclampsia in lung treatment.

REFERENCES


