ABSTRACT

OBJECTIVE: To identify the socio-demographic and other risk factors associated with pre-eclampsia, eclampsia and its adverse outcomes in low- and middle-income pregnant females.

METHODS: This cross-sectional study was conducted at three tertiary care hospitals of Peshawar, Pakistan on 113 pregnant women (43 with pre-eclampsia, 37 with eclampsia and 33 without pre-eclampsia/eclampsia). Data was collected by interviewing study subjects using a pre-tested questionnaire incorporating important risk factors of pre-eclampsia and eclampsia. Data was analyzed using SPSS.

RESULTS: Majority (89.4%) of women were >20 years of age. Out of 113 study participants, 78 (69.02%) were from low-income (Rs<8500) and 35 (30.98%) were from middle-income (Rs=8501-103900) group. Thirty one (83.78%) patients of eclampsia, 32 (74.42%) of pre-eclampsia and 15 (45.45%) normotensive pregnant women were from low-income group (p<0.01). Forty-nine of 113 (43.3%) antenatal women had no antenatal visits and 48 (42.5%) had 1-3 antenatal visits. About half of women with low-income (n=40/78, 51.3%) had no antenatal visits as compared to middle-income (n=9/36; 25.7%). Out of 49 women with no antenatal visits, 23 (46.94%) were eclamptic, 25 (51.02%) were having pre-eclampsia and 1 (2.04%) was normotensive. In this study, 23/37 (62.26%) of eclampsia, 25/43 (58.14%) of pre-eclampsia and 1/33 (3.03%) of normotensive pregnant women had no antenatal visits. Twenty (17.7%) antenatal women had history of >2 still-births and majority (n=16/20; 80%) were from low-income group.

CONCLUSION: Lower class socio-economic status and lack of antenatal visit are associated with pre-eclampsia and eclampsia and related adverse outcome. Interventions at primary care level are in need.

KEY WORDS: Pregnancy Outcome (MeSH), Eclampsia (MeSH), Pre-eclampsia (MeSH), Pregnancy (MeSH), Hypertension (MeSH), Low Income Population (MeSH), Poverty (MeSH).

INTRODUCTION

Pre-eclampsia and eclampsia are the major causes of perinatal and maternal mortality and morbidity which equally prevails, in poor and rich countries of the world. About 3-8% pregnancy complication attributes to pre-eclampsia. The rate of occurrence is on higher side in developing countries because of poor diet. On the whole, death ratio of mothers is estimated to 10-15% due to pre-eclampsia and eclampsia. In the developing world, pre-eclampsia has bad impact on maternal and perinatal health in low- and middle-income settings. It is a major cause of almost one third of a million maternal deaths. It is the broad complication of pregnancy and this incidence showing perpetual increase annually in the world. Approximately 50,000 deaths occur due to dominant causes of maternal morbidity and mortality. In addition, pre-eclampsia is a disorder in the developing countries and major cause for loss of lives over six million perinatal deaths, about eight million preterm births and nearly 20 million low-birth weight infants.

Globally, women die greater than half a million each year of pregnancy related causes and 99% of these deaths occur in developing countries. Eclampsia accounts for 50,000 maternal deaths in a year. There is limited research assessing the level of risks in pre-eclampsia’s poor maternal and peri-natal outcomes. In low-resource setting where the impact is thought to be more severe. Moreover, small sample sizes for some important confounders are notable weaknesses that have restricted prior research. Various studies reveal that at average in the world, 13% maternal death occur due to hypertensive disorders during pregnancy.

The incidence of pre-eclampsia increases due to many risk factors which contain multi fetal gestations, nulli parity, previous history of pre-eclampsia, age >35 years at first pregnancy, African American race and smoking. Some other medical disorder like vascular and connective tissue disorders like systemic lupus erythematous and antiphospholipid antibodies can also increases the incidence of pre-eclampsia. With the primi parous women, there is a discrep-
Risk Factors of Preeclampsia and Eclampsia

Maternal and neonatal health is adversely affected by pre-eclampsia and eclampsia especially in low and middle income countries. The aim was to identify the socio-demographic and other risk factors associated with pre-eclampsia, eclampsia and its adverse outcomes in low- and middle-income pregnant females.

METHODS

This comparative study was conducted in between March-October, 2014 in the Department of Obstetrics and Gynecology, in three tertiary care hospitals (Hayatabad Medical Complex, Khyber Teaching Hospital and Lady Reading Hospital) of Peshawar, Pakistan. Sample size was calculated from WHO calculator which was 113. Equal numbers of pregnant females were selected from three hospitals and consecutive sampling method was used. Data was collected from pregnant females through a pre-tested questionnaire about socio-demographic and other risk factors. Pre-eclampsia, eclampsia and normotensive were defined on the basis of doctor’s diagnosed prescription. Socio-economic status was defined into low income (Rs.<8500) and middle income (Rs.=8501-103900) class on the basis of World Bank Classification of per capita income. The pregnant females with prior history of renal disease, cardiovascular diseases and chronic hypertension were excluded from the study. Prior collecting data, informed written consent was obtained from all the study participants and ethical approval was taken from Khyber Medical University Ethical Board. Data was compiled in Microsoft excel and analyzed using chi square test in SPSS 17.

RESULTS

Pregnant women of age more than 20 years were at risk of developing pre-eclampsia and eclampsia compared to age of less than 20 years (Table I).

Out of 113 study participants, 78 (69.02%) were from low-income (Rs.<8500) and 35 (30.98%) were from middle-income (Rs.= 8501-103900) group (Table II). Thirty one (83.78%) of eclamptic, 32 (74.42%) of pre-eclamptic and 15 (45.45) of normotensive were from low-income group whereas 6 (16.22%), 11 (25.58) and 18 (54.55) were from middle-income group respectively (Table II). Thirty one (83.78%) of eclamptic, 32 (74.42%) of pre-eclamptic and 15 (45.45) of normotensive were from low-income group whereas 6 (16.22%), 11 (25.58) and 18 (54.55) were from middle-income group respectively (Table II).

TABLE I: DISTRIBUTION OF SAMPLES ACCORDING TO AGE

<table>
<thead>
<tr>
<th>Age Group (years)</th>
<th>Pre-eclampsia</th>
<th>Eclampsia</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency (n=43)</td>
<td>Percentage</td>
<td>Frequency (n=37)</td>
</tr>
<tr>
<td>15-20</td>
<td>4</td>
<td>9.3</td>
<td>6</td>
</tr>
<tr>
<td>21-25</td>
<td>9</td>
<td>20.9</td>
<td>12</td>
</tr>
<tr>
<td>26-30</td>
<td>5</td>
<td>11.6</td>
<td>4</td>
</tr>
<tr>
<td>31-35</td>
<td>11</td>
<td>25.6</td>
<td>5</td>
</tr>
<tr>
<td>36-40</td>
<td>7</td>
<td>16.3</td>
<td>5</td>
</tr>
<tr>
<td>41-45</td>
<td>7</td>
<td>16.3</td>
<td>5</td>
</tr>
</tbody>
</table>

TABLE II: SOCIOECONOMIC CLASSES OF THE STUDY GROUPS

<table>
<thead>
<tr>
<th>Socio-economic status</th>
<th>Eclampsia</th>
<th>Pre-eclampsia</th>
<th>Normotensive</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low income (Rs &lt;8500) (n=78)</td>
<td>Frequency 31</td>
<td>Percentage 83.78</td>
<td>Frequency 32</td>
<td>Percentage 74.42</td>
</tr>
<tr>
<td>Middle income (Rs = 8501-103900) (n=35)</td>
<td>6</td>
<td>16.22</td>
<td>11</td>
<td>25.58</td>
</tr>
</tbody>
</table>

TABLE III: FREQUENCY OF ANTENATAL VISITS BY THE DIFFERENT GROUPS

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Socio-economic status</th>
<th>0 visit (n=49)</th>
<th>1-3 visit (n=48)</th>
<th>&gt;3 (n=16)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eclampsia (n=37)</td>
<td>Low income (Rs&lt;8500)</td>
<td>19 (82.61)</td>
<td>9 (81.82)</td>
<td>3 (100)</td>
<td>0.728</td>
</tr>
<tr>
<td></td>
<td>Middle income (Rs= 8501-103900)</td>
<td>4 (17.39)</td>
<td>2 (18.18)</td>
<td>0 (0.00)</td>
<td></td>
</tr>
<tr>
<td>Pre-eclampsia (n=43)</td>
<td>Low income (Rs&lt;8500)</td>
<td>20 (80)</td>
<td>11 (73.33)</td>
<td>1 (33.33)</td>
<td>0.215</td>
</tr>
<tr>
<td></td>
<td>Middle income (Rs= 8501-103900)</td>
<td>5 (20)</td>
<td>4 (26.67)</td>
<td>2 (66.67)</td>
<td></td>
</tr>
<tr>
<td>Normotensive (n=33)</td>
<td>Low income (Rs&lt;8500)</td>
<td>1 (100)</td>
<td>10 (45.45)</td>
<td>4 (40)</td>
<td>0.517</td>
</tr>
<tr>
<td></td>
<td>Middle income (Rs= 8501-103900)</td>
<td>0 (0.00)</td>
<td>12 (54.55)</td>
<td>6 (60)</td>
<td></td>
</tr>
</tbody>
</table>
sia and 15 (45.45%) of normotensive pregnant women were from low-income group (p<0.01).

Forty-nine of 113 (43.3%) antenatal women had no antenatal visits, 48 (42.5%) had 1-3 antenatal visits and 16 (14.2%) had >3 antenatal visits (Table III). About half of women with low-income (n=40/78, 51.3%) had no antenatal visits as compared to middle-income (n=9/36; 25.7%).

Out of 49 women with no antenatal visits, 23 (46.94%) were eclamptic, 25 (51.02%) were having pre-eclampsia and 1 (2.04%) was normotensive. In 48 women with 1-3 antenatal visits, 11 (22.92%) had eclampsia, 15 (31.25%) had pre-eclampsia and 22 (45.83%) were normotensive. In this study, 23/37 (62.26%) of eclampsia, 25/43 (58.14%) of pre-eclampsia and 1/33 (3.03%) of normotensive pregnant women had no antenatal visits. Twenty (17.7%) antenatal women had history of >2 still births and majority (n=16/20; 80%) were from low-income group (Table IV).

**DISCUSSION**

Our study suggests that the chances of a woman having pre-eclampsia and eclampsia is associated with low socio-economic status, age at pregnancy, antenatal visits and fetal outcome. In addition to others, the poor socio-economic background is crucial in accelerating the risk of eclampsia due to non-provision of balanced nutrition, unplanned ante-natal care coupled with poor sanitation and hygienic conditions. Mexico is a practical example where women social and economic status is deteriorated and attendant threat for pre-eclampsia and eclampsia has become double. In our study pregnant women low income were at increased risk of being pre-eclamptic and eclamptic compared to those with middle income group and the association is significant.

Older maternal age has been found to be an independent risk factor for pre-eclampsia and eclampsia, whereas in this study most of the cases were in the age group 21–25. In advanced ages, the frequency of villous reaction increases which ultimately become a cause for pre-eclampsia in women of about 20 years of age. Many studies have confirmed the same findings. There is, however, a need to focus on the incidence of pre-eclampsia in women below 20 years of age which is yet a major challenge that remain ahead for the researchers.

The study conducted by Hernandez et al. found that incidence of pre-eclampsia is 4.1% in primigravida while it is 1.7% in subsequent pregnancies. Incidence in multiparous women is calculated to be 1% without a history of pre-eclampsia.

Due to unawareness of women the incidence of abortion and eclampsia are higher when compared to other studies who delay visits to the hospital. Some people do not trust expert medical care and feel hesitant by using the available facilities. The women sometimes cannot afford paying the cost for necessary health care. They are the ones most likely to develop complications in the absence of resources.

Main factors determining perinatal mortality was the lack of normal antenatal checkups, pre-eclampsia and lack of awareness about significance of symptoms like decreased fetal movements and delay visits to hospital, all causative to stillbirths. In epidemiologic studies, reports reveal that three million stillbirths take place annually worldwide. A study from Iran also reports 12% of stillbirth cases. Lack of antenatal care is associated with increased number of stillbirth in resource-poor settings. In this context the outcome of our study are reliable and conform to the findings of Jehan et al in Pakistan and Wilson et al in the USA.

Limitation of Study: It was a comparative study carried out in three tertiary care hospital of provincial metropolis Peshawar. The results of this study cannot be generalized on the whole Khyber Pakhtunkhwa, Pakistan. Population based study with large sample size should be conducted to know the actual burden of pre-eclampsia and eclampsia in pregnant females and its association with socio-economic class.

**CONCLUSION**

Lower class socio-economic status and lack of antenatal visit are associated with pre-eclampsia and eclampsia and related adverse outcome. Early diagnosis and treatment can play a vital role. In low- and middle-income settings, health care interventions at primary care level are required to reduce the burden of maternal and perinatal death.
REFERENCES


CONFLICT OF INTEREST
Authors declare no conflict of interest

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NIL

AUTHOR’S CONTRIBUTION
Following authors have made substantial contributions to the manuscript as under:

AS: Conception, acquisition of data, drafting the manuscript, final approval of the version.
RA: Analysis & interpretation of data, final approval of the version.
RN: Study design, critical review, supervision, final approval of the version.
MTS: Drafting the manuscript, final approval of the version.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

KMUJ web address: www.kmuj.kmu.edu.pk
Email address: kmuj@kmu.edu.pk