Association between Maternal Socio–economic Status, Polygamy and Risk of Pre–eclampsia in Rural Areas of Northern Nigeria

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Abstract
Objective: To examine association between maternal socio–cultural status, as indicated by maternal Income, education and polygamy with severity of pre–eclampsia.

Materials and methods: This study was carried out in Primary Health Centers in Katsina, Adamawa and Borno States. A total of two groups of subjects were selected for the study, with 50 Subjects in each group. Group A – pregnant non hypertensive women; Group B women with pre–eclampsia. Blood pressure was measured in a sitting position with sphygmomanometer after at least 10 minutes of rest. A semi structured questionnaire was administered to each respondent. P value ≤ 0.05 was accepted as significant difference.

Results: Systolic and diastolic blood pressure BP was significantly different. (167.60±2.75 and 107.48±8.01 Vs. 116.70±0.98 and 76.80±8.67 in group B Vs. group A respectively, P<0.05). In Socio–cultural background significant correlation exists between pre–eclampsia and age at first marriage (P= 0.01). There also exists a correlation between age and number of marriages (P= 0.05). Age, parity, history of hypertension and number of marriages are negatively and significantly correlated with pre– eclampsia.

Conclusion: This study found that seclusion and polygamy are not risk factors for developing pre–eclampsia.

Key words: Pre–eclampsia, Polygamy, Poverty, Seclusion

Introduction
Pre–eclampsia (PE) is a complex pregnancy complication associated with increased blood pressure accompanied by proteinuria, edema, or both (1).

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This condition seems to be linked to oxidative stress within the placenta. Increased production of lipid peroxides, thromboxane and/or cytokines triggered vascular and organic dysfunction have been observed in pre–eclampsia (2). Pre–eclampsia (PE) is one of the causes of high morbidity for both mother and fetus, especially in developing countries; Pre–eclampsia is characterized by hypertension, proteinuria, and edema. Without intervention, pre–eclampsia progresses to eclampsia, this is characterized by malignant hypertension.
and epileptiform convulsions requiring emergency cesarean section (3).

Several risk factors have been identified in women who develop pre-eclampsia. These include nulliparity, history of pre-eclampsia in previous pregnancy, extremes of maternal age, multi fetal gestation, several preexisting maternal diseases (chronic hypertension, diabetes mellitus, chronic kidney disease, vascular or connective tissue disease, thrombophilia, high Body Mass Index (BMI) (4), and possibly, long interval between pregnancies. Of these, obesity (where the risk of pre-eclampsia increases three-fold), is the most common. Despite known risk factors, it is not possible to predict which woman will develop pre-eclampsia during pregnancy. Numerous screening tests for pre-eclampsia e.g. urine protein, Full Blood Counts, Liver Function Test etc. have been proposed over the past few decades. A screening test should however be safe, valid, reliable, and acceptable to the population, reproducible, appropriate for the population, and economical. However, to date, no test has been shown to appropriately screen for pre-eclampsia (5).

The incidence of pre-eclampsia varies greatly worldwide. WHO (6) estimates the incidence (or number of new cases) of pre-eclampsia to be seven times higher in developing countries (2.8% of live births) than in developed countries (0.4%) which is due to poor health seeking behaviours, availability of health care facilities and personnel (7). In Nigeria the incidence is higher in the Northern part of the country with prevalence rate of 17% (8).

Screening for women at risk of pre-eclampsia is an important part of antenatal care. Routine screening for pre-eclampsia is based on measurement of blood pressure and urinalysis for proteinuria. Once women have been identified as being at high risk, they can be targeted for more intensive antenatal surveillance and prophylactic interventions such as early delivery.

Most current strategies for risk assessment are based on the obstetric and medical history and clinical examination. Pregnant women are assessed at their first antenatal visit while others are already attending the ANC. Exclusion criteria were recruited during antenatal clinics, some during their first visits while others are already attending the ANC.

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Statistical analysis

Data were expressed as ± SEM. Descriptive statistics was used to analyze the questionnaire, while Pearson correlation coefficient was used, one way ANOVA and Scheffe Post Hoc Tests were conducted to analyzed the significant difference between mean values.
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Results

Table 1 shows the demographic and clinical characteristics of pregnant non hypertensive and pre-eclamptic women respective. Mean age among is 24.52 ± 0.53 in pregnant non hypertensive and 24.03 ± 0.65 in the pre–eclamptic group. ANOVA and Scheffe Post Hoc test showed that there was no significant difference in this regard. The only significant difference was the age at marriage time with the pre–eclamptic group having a mean age of 18.23 ± 0.21 when compared with 23.19 ± 0.23 of pregnant non hypertensive group (p<0.05).

Systolic and diastolic blood pressures were significantly different. The systolic SEM of the pre–eclamptic group was 167.60 ± 2.75 against 116.40 ± 0.73 in pregnant non hypertensives, while the diastolic SEM for the pregnant non hypertensive group was 76.80 ± 8.67 compared to 107.48 ± 8.01 of pre–eclamptic group.

From 74 primigravids 54% are pre–eclamptic while 32% of the multigravida are pre–eclamptic.

Table 2 shows correlation of socio-cultural background of pre–eclamptic women. A significant correlation (P=0.01) exists between pre–eclampsia and age at first marriage. likewise there is a significant correlation (P= 0.05) between age and number of marriages. Age at first marriage, age, parity, history of hypertension and number of marriages are negatively correlated with pre–eclampsia.

Figure 1 shows the educational status of the groups. Totally 56% of the respondents are not educated. Among the pre–eclamptic group the highest educational status was traditional Islamic school while the pregnant non hypertensive group has the highest number of cases with tertiary and secondary school educations.

Figure 2 shows medical history of family members of the two groups. It is shown that 45 % of the pre–eclamptic respondents have family history of hypertension, 35 % have diabetes and 20 % have kidney disease while in pregnant non hypertensive group 30% have history of HTN, 7% diabetes and 8% kidney diseases in their family.

There is no significant difference between 2 groups regarding seclusion according to figure 3.

Figure 4 shows the various income sources of respondents. In non–hypertensive group 78 % have some kind of income generating activities but in pre–eclamptic group 45% of responders had a source for income. Rate of attending antenatal clinic is 92% in non–hypertensive and only 30% in pre–eclamptic group.

Table 1. Demographic and Clinical Characteristics of Pregnant non Hypertensive and Pre–eclamptic women.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Pregnant Non Hypertensive N=50</th>
<th>Pre–eclamptic N=50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Years)</td>
<td>24.52 ± 0.53</td>
<td>24.03 ± 0.65</td>
</tr>
<tr>
<td>Age at Marriage</td>
<td>23.19 ± 0.23</td>
<td>18.23 ± 0.21**</td>
</tr>
<tr>
<td>Primigravida</td>
<td>24</td>
<td>27</td>
</tr>
<tr>
<td>Multiparagavida</td>
<td>26</td>
<td>23</td>
</tr>
<tr>
<td>Gestation age (weeks)</td>
<td>23.12 ± 1.43</td>
<td>23.22 ± 0.24</td>
</tr>
<tr>
<td>Systolic BP mmHg</td>
<td>116.40 ± 0.73</td>
<td>167.60 ± 2.75**</td>
</tr>
<tr>
<td>Diastolic BP mmHg</td>
<td>76.80 ± 8.67</td>
<td>107.48 ± 8.01**</td>
</tr>
<tr>
<td>% Fat</td>
<td>28.86 ± 1.02</td>
<td>29.07 ± 1.22</td>
</tr>
<tr>
<td>BMI</td>
<td>26.95 ± 0.54</td>
<td>27.05 ± 0.74</td>
</tr>
</tbody>
</table>

P< 0.05 , * = Indicate , ** = Significant Difference   ,  With Group A only

Note: The values are means of ± SEM F value of ANOVA and Scheffe post hoc test.

Table 2. Pearson Correlation of Socio–Cultural Background of Pre–eclamptic women.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Age at 1st Marriage</th>
<th>Parity</th>
<th>HX of HTN</th>
<th>No of wives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.330**</td>
<td>0.495**</td>
<td>0.309*</td>
<td>0.244</td>
</tr>
<tr>
<td>Age at marriage</td>
<td>1</td>
<td>-0.289*</td>
<td>-0.287*</td>
<td>-0.352*</td>
</tr>
<tr>
<td>Parity</td>
<td>-0.289*</td>
<td>1</td>
<td>0.599**</td>
<td>-0.301*</td>
</tr>
</tbody>
</table>

* Correlation is significant at 0.05 levels (2–tailed)
** Correlation is significant at the 0.01 level (2–tailed)
Discussion

There are few studies conducted in subjects with lower socio-economic background and lower age range in regards to pre-eclampsia. In present study demographic characteristics of the cases had no differences.

This study shows that there is no significance difference between women that are secluded and those that are not in terms of risk for developing pre-eclampsia. This finding is in agreement with the Report of Report of the National High Blood Pressure Education Program Working Group on High Blood Pressure (13).

The present study found a significant correlation through education and income generation activities as a risk factors in developing pre-eclampsia because majority of the pre-eclamptic women have not attended any kind of school both western and Islamic, like wise those that lack any sources of income and totally depend on husband for medical bills, have higher risk of pre- eclampsia. It is possible that the association represents poor access to antenatal care.

This findings is similar to what was found by Dlamini (14) who found that poverty in adults is associa-
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Our finding is distinct with the studies of Gudmundsson (15) who found that the risk and severity of pre–eclampsia is not associated with poverty among women, but his study was discussing about developed countries.

Family history of hypertension and preeclampsia which is a risk factor in developing pre–eclampsia has been observed in this research as majority of pre–eclamptic women mention either one of their family members of being hypertensive. Family history of hypertension reflects genetic and behavioral factors whereby women may be predisposed to an increased pre–eclampsia risk.

Conclusion

Pre–eclampsia is common in rural areas of Northern Nigeria due to presence of high risk factors and can lead to high maternal mortality in the these states respectively. Risk factors for pre–eclampsia among women leaving in rural areas of Northern Nigeria with the exception of increased BMI are not much different from those that have been reported in other studies.

This study also found that seclusion and polygamy are not risk factors for developing pre–eclampsia.

In efforts to identify women at risk of developing pre–eclampsia during pregnancy, a question about family history of pre–eclampsia should be included during antenatal clinics.

Figure 3. Percentage of women that are secluded or not

Figure 4. Income Generation Activities
Acknowledgement
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References