Original Article

A study of hypertensive disorders in pregnancy among tribal women at tertiary level care in bastar Chhattisgarh

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ABSTRACT

Abstract Background: Hypertensive Disorders of Pregnancy (Eclamptic and Noneclamptic) have been documented since ancient times. Pregnancy induced hypertension (PIH), Preeclampsia and Eclampsia are well-known disorders associated with the increased risk of maternal and fetal complications. It is often discussed in the research literatures of the world that the incidence of Hypertensive Disorders of Pregnancy (Eclamptic and Noneclamptic) is on the decline in developed world, but it is still a threat in developing countries particularly in rural and tribal area. AIM: The primary objective is to determine incidence of hypertensive disorders of pregnancy among tribal and nontribal women of Bastar Chhattisgarh and to discuss recommendations for reducing the risk of Hypertensive disorders of pregnancy. Objectives: The primary objective is:- (i) To determine incidence of hypertensive disorders of pregnancy among tribal and nontribal women of Bastar Chhattisgarh and (ii) To discuss recommendations for reducing the risk of Hypertensive disorders of pregnancy. Materials and Methods: This is a hospital based, retrospective study of all available records of the patients that were admitted in indoor wards and managed in Obstetrics and gynecology Department Late Shri Bali Ram Kashyp Memorial Medical College, Jagdalpur, Bastar, Chhattisgarh, between July 2007 and Dec. 2012. Results: Overall incidence of Hypertensive Disorders of Pregnancy was 7.6%, including incidence 4.860 % of pre-eclampsia, 0.993 % of eclampsia and 1.744 % of pregnancy induced hypertension. On further stratification it is revealed that among tribal total incidence of hypertensive disorders of pregnancy is 6.974 and among women of nontribal background incidence is 0.625. Strategies to prevent these morbidity and mortality have been discussed in detail in discussion section. Conclusion: Evidence in this study suggest that among tribal women total incidence of Hypertensive disorders of pregnancy (HDP) is much higher and maximum cases were in 20-25 years of early age group, primigravid/nullipara and those in preterm gestation. Morbidity and mortality associated with hypertensive disorders of pregnancy are the most difficult to prevent. A well structured research work is needed for assessment of interventions designed to reduce the risk of Hypertensive disorders of pregnancy with particular emphasis among tribal high risk group.

1. Introduction

1.1 Hypertensive disorders of pregnancy (HDP) represent a group of conditions associated with high blood pressure during pregnancy, proteinuria and in some cases convulsions. The most serious consequences for the mother and the baby result from pre-eclampsia and eclampsia. In the GBD 1990 hypertensive disorders of pregnancy ranked 75th in terms of DALYs and were responsible for 6% of the burden of all maternal conditions. It was estimated that deaths due to hypertensive disorders of pregnancy represented 13% of all maternal deaths. [1]

1.2 Preeclampsia or preeclampsia is a medical condition characterized by high blood pressure and significant amounts of protein in the urine of a pregnant woman. If left untreated, it can develop into eclampsia, the life-threatening occurrence of seizures during pregnancy.[2]

1.3 Pre-eclampsia may develop from 20 weeks’ gestation (it is considered early onset before 32 weeks, which is associated with
an increased morbidity). Its progress differs among patients; most cases are diagnosed before labor typically would begin. Pre-eclampsia may also occur up to six weeks after delivery. Apart from Caesarean section and induction of labor (and therefore delivery of the placenta), there is no known cure. It is the most common of the dangerous pregnancy complications; it may affect both the mother and fetus. [2]

Other symptoms

1.4 Swelling or edema (especially in the hands and face) was originally considered an important sign for a diagnosis of pre-eclampsia, but in current medical practice only hypertension and proteinuria are necessary for a diagnosis. [2]

1.5 Pitting edema (unusual swelling, particularly of the hands, feet, or face, notable by leaving an indentation when pressed on) can be significant, and should be reported to a health care provider. [2]

1.6 Although eclampsia is potentially fatal (2% of cases), pre-eclampsia is often asymptomatic, and so its detection depends on signs or investigations. Nonetheless, one symptom is crucially important because it is often misinterpreted: epigastric pain may be confused with heartburn, a common problem of pregnancy. In general, none of the signs of pre-eclampsia are specific, and even convulsions in pregnancy are more likely to have causes other than eclampsia in modern practice. Diagnosis, therefore, depends on finding a coincidence of several pre-eclamptic features, the final proof being their regression after delivery. [2]

1.4 Pregnancy-Induced-Hypertension: Some women develop high blood pressure without proteinuria (protein in urine), which is called pregnancy-induced hypertension (PIH) or gestational hypertension. Both pre-eclampsia and PIH are regarded as very serious conditions and require careful monitoring of mother and baby. [2]

2. Tribal of Bastar

2.1 Bastar, the land of tribes and about 70% of the total population of Bastar comprises tribals, which is 26.76% of the total tribal population of Chhattisgarh. The major tribes of the Bastar region are the Gond, Abhuj Maria, Bhatra Bhatra are divided into Sub Cast San Bhatra, Pit Bhatra, Ammit Bhatra Ammit Hold Highest Status, Halbaa, Dhuurva, Muria and Bison Horn Maria. The Gonds of Bastar are one of the most famous tribes in India, known for their unique Ghotul system of marriages. Gonds are also the largest tribal group of central India in terms of population. [3] A large number of Bastar tribals are still living in deep forests and avoid mixing with outsiders in order to protect their own unique culture. [3]

3. Objectives

The primary objective is:

(i) To determine incidence of hypertensive disorders of pregnancy among tribal and nontribal women of Bastar Chhattisgarh and

(ii) To discuss recommendations for reducing the risk of Hypertensive disorders of pregnancy.

4. Material and Method

4.1 Study Design: This is a hospital based, retrospective study of tribal women of Bastar region, Chhattisgarh that were admitted and managed in (tertiary care level) Obstetrics and Gynecology Department Govt. Medical College, Jagdalpur, Bastar, Chhattisgarh, between July 2007 and Dec. 2012.

4.3 Study Population: The sample consisted of total 37240 (n=37240) delivery cases were admitted in indoor wards and managed in tertiary care level. Out of these total 2844 (n=2844) were of Hypertensive Disorders of Pregnancy (HDP) (Eclamptic and noneclamptic) have been included in this study.

4.4 Sampling: Total 37420 (n=37240) obstetric delivery cases were admitted in indoor wards in tertiary care level, between July 2007 and Dec. 2012. Out of these 2844 (n=2844) were of Hypertensive Disorders of Pregnancy (Eclamptic and noneclamptic) and these 2844 (n=2844) have been included in this study. On further division of 2844 (n=2844) cases of Hypertensive Disorders of Pregnancy (HDP) 2610 (n=2610) were in tribal group and 234 (n=234) were in women of nontribal background.

4.5 Inclusion Criteria:

(i) All obstetric cases admitted in indoor wards and managed in tertiary care level, between July 2007 and Dec. 2012,

4.6 Exclusion Criteria:

(i) Patients whose records were not available.

4.7 Limitations:

(i) It has been noted that mostly pregnant women suffering from any of the hypertensive disorder, come to the tertiary level care very late, when symptoms and signs are fully developed and without any antenatal record. Hence it was not possible to assess whether patients were suffering from chronic hypertension, Renal disease or Diabetes Mellitus.

(ii) Booked cases percentage is very low. Total 136 (4.87%) were booked and 2708 (95.21%) were unbooked cases. Among booked cases total 50 (1.75%) were of tribal group. And total 86 (3.02%) were of non tribal group.
4.8 Data collection: The data was collected from all available records in the department of Obstetrics and Gynaecology with permission of Head of the Department. It included age, socioeconomic characteristics, and medical examination records, blood and serological examination.

4.9 Data Analysis: Data was entered and analysed by SPSS (version 18.0) software. Descriptive analysis was done to find frequencies, percentages and proportions. Means of the variables were drawn with standard distribution. To test significance chi-square test was used and p<0.05 taken as significant.

4.10 Diagnosis Criteria:

Pre-eclampsia is diagnosed when a pregnant woman develops both:

- Blood Pressure >140 systolic and/or >90 diastolic (two separate readings taken at least six hours apart)
- 300 mg of protein in a 24-hour urine sample (proteinuria).

A rise in baseline blood pressure (BP) of 30 mmHg systolic or 15 mmHg diastolic, while not meeting the absolute criteria of 140/90, is still considered important to note, but is not considered diagnostic.

"Severe pre-eclampsia" involves a BP over 160/110,[4][5] proteinuria more than 5 g / 24 h and signs of end organ damage (CNS dysfunction with symptoms like headache; pulmonary edema; renal dysfunction with oliguria or creatinine over 1.5 mg/dL; hepatocellular injury with ALT more than two-fold upper normal limit; hematologic dysfunction with platelet count less than 100,000/L or DIC; placental dysfunction with IUGR or oligohydramnios etc.) [4]

5. Results

Total 37420 (n=37240) obstetric cases were admitted and managed wef July 2007 to Dec. 2012 in tertiary care level Bastar, Chhattisgarh. (Department of Obstetrics & Gynecology, Late Shri Bali Ram Kashyp Memorial Govt. Medical College, Jagdalpur; Bastar, Chhattisgarh). Among these 37420 cases, 2844 (n=2844) (7.6%) were of Hypertensive Disorders of Pregnancy (Eclamptic and noneclamptic).

The results of study have been depicted in Table 1, 2, 3, 4, 5 and 6 as follows:-

Table [1] shows:

5.1 Overall incidence of Hypertensive Disorders of Pregnancy was 7.6%, including incidence 4.860 % of pre-eclampsia, 0.993 % of eclampsia and 1.744 % of pregnancy induced hypertension.

5.2 On further stratification it is revealed that among tribal total incidence of hypertensive disorders of pregnancy is 6.974. Out of this of Pre eclampsia 4.484, of Pregnancy induced Hypertension 1.619 and of eclampsia 0.871. Among women of nontribal background incidence is 0.625. Out of this of Preeclampsia 0.376, of Pregnancy induced Hypertension 0.125 and of eclampsia 0.122.

5.3 Among 2844 cases of Hypertensive Disorders of Pregnancy, majority cases 1819 (63.95%) were of Pre-eclampsia second highest 653 (22.95%) Pregnancy Induced Hypertension (PIH) than 372 (13.1%) cases of Eclampsia.

5.4 Out of total 2844 cases of Hypertensive Disorders of Pregnancy, 2610 (n=2610) (91.78%) were of tribal group and remaining 234 (n=234) (8.22%) in women of nontribal background.

5.5 Among total 2610 (91.78%) cases of tribal group maximum 1678 (59%) were of Preeclampsia, 606 (21.3%) were of PIH (Pregnancy Induced Hypertension) and 326 (11.46%) were of eclampsia.

5.6 Among total 234 (8.22%) cases of non tribal group maximum 141 (4.95%) were of Preeclampsia, 47 (1.65%) were of PIH (Pregnancy Induced Hypertension) and 46 (1.61%) were of eclampsia.

5.7 Maximum 2242 (78.78%) patients were between 20-25 years of age, and 137 (4.83%) in 26-27 age group, 246 (8.68%) in 28-29 age group, 246 (8.68%) in 30-35 age group and 57 (1.97%) in 40 years of age.

5.8 In tribal group maximum 2101 (73.87%) cases were in 20-25 years of early age, and 137 (4.83%) cases were in 26-27 age group, 115 (4.06%) in 28-29 age group, 200 (7.05%) in 30-35 age group and 57 (1.97%) in 40 years of age group.

5.9 In nontribal group maximum 141 (4.95%) cases were between 20-25 years of age, and 47 (1.63%) cases were in 28-29 age group and 46 (1.61%) in 30-35 age group.
TABLE 2. 5.10 For calculating Chi-squared test x² degree of freedom and p-value the following data of tribal and nontribal TABLE 3 have been obtained from above TABLE 2:-

<table>
<thead>
<tr>
<th>AGE</th>
<th>18-20</th>
<th>21-22</th>
<th>23-25</th>
<th>26-27</th>
<th>28-29</th>
<th>30-35</th>
<th>40</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRIBAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eclampsia</td>
<td>119</td>
<td>74</td>
<td>63</td>
<td>28</td>
<td>23</td>
<td>13</td>
<td>6</td>
<td>326</td>
</tr>
<tr>
<td>Pre-eclampsia</td>
<td>529</td>
<td>445</td>
<td>499</td>
<td>63</td>
<td>46</td>
<td>47</td>
<td>49</td>
<td>1678</td>
</tr>
<tr>
<td>PIH</td>
<td>93</td>
<td>186</td>
<td>93</td>
<td>46</td>
<td>46</td>
<td>140</td>
<td>2</td>
<td>606</td>
</tr>
<tr>
<td>TOTAL</td>
<td>741</td>
<td>705</td>
<td>655</td>
<td>137</td>
<td>115</td>
<td>200</td>
<td>57</td>
<td>2610</td>
</tr>
</tbody>
</table>

TABLE 3. 5.11 After calculation of the TABLE 3 there are three variables between tribals and nontribals is highly significant. x² test = 9.90 at degree of freedom 2 and p-value is 0.007086.

<table>
<thead>
<tr>
<th></th>
<th>TRIBAL</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eclampsia</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>46</td>
<td>0</td>
<td>46</td>
</tr>
<tr>
<td>Pre-eclampsia</td>
<td>47</td>
<td>47</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>141</td>
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<td>PIH</td>
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<td>0</td>
<td>47</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>47</td>
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<tr>
<td>TOTAL</td>
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<td>47</td>
<td>47</td>
<td>0</td>
<td>0</td>
<td>46</td>
<td>0</td>
<td>234</td>
</tr>
</tbody>
</table>

Table [6] shows: Perinatal, maternal outcome amongst tribal and nontribal and the indicates extent and statistical significance of each variable.

5.17 Perinatal and maternal outcome of hypertensive disorder of pregnancy cases. In this total 136 (4.87%) were booked and 2708 (95.21%) were unbooked cases. Among booked cases total 50 (1.75%) were of tribal group. And total 86 (3.02%) were of non tribal group.

5.18 Highest 1978 (69.54%) cases of hypertensive disorder of pregnancy were primigravida. Among 1978 (69.54%) primigravida cases maximum 1767 (62.13%) were in tribal group and next 211 (7.41%) cases in women of nontribal background. Among 866 (30.45%) cases of Multigravida highest 843 (29.64%) cases were in tribal group and only 23 (0.80%) were in women of nontribal background.

5.19 154 (5.41%) cases were delivered through caesarean section (LSCS). Among these 116 (4.07%) were of tribal group and 38 (1.33%) were of nontribal background.
5.20 116 (4.07%) cases were delivered by forceps. Among these 87 (3.05%) were of tribal group and 29 (1.01%) were of nontribal background.

5.21 2423 (85.19%) cases were delivered normally (ND). Among these 2263 (95.57%) were of tribal group and 160 (5.62%) were of nontribal background.

### TABLE 6
PERINATAL AND MATERNAL OUTCOME IN HYPERTENSIVE DISORDERS OF PREGNANCY WITH $\chi^2$ TEST AND P-VALUE

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Tribal</th>
<th>Nontribal</th>
<th>GRAND TOTAL</th>
<th>$\chi^2$ Test and p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Eclampsia (n=326)</td>
<td>Pre-eclampsia (n=1678)</td>
<td>(n=2610)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PIH (n=606)</td>
<td>Total (n=46)</td>
<td>(n=141)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Eclampsia (n=46)</td>
<td>Pre-eclampsia (n=47)</td>
<td>PIH (n=234)</td>
<td></td>
</tr>
<tr>
<td>(A) Booked</td>
<td>19</td>
<td>10</td>
<td>50</td>
<td>17</td>
</tr>
<tr>
<td>(ii) Unbooked</td>
<td>307</td>
<td>1668</td>
<td>585</td>
<td>2560</td>
</tr>
<tr>
<td>(B) Parity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i) Primigravida</td>
<td>256</td>
<td>1079</td>
<td>432</td>
<td>1767</td>
</tr>
<tr>
<td>(ii) Multigravida</td>
<td>70</td>
<td>599</td>
<td>174</td>
<td>843</td>
</tr>
<tr>
<td>(C) Mode of Delivery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i) LSC</td>
<td>16</td>
<td>72</td>
<td>28</td>
<td>116</td>
</tr>
<tr>
<td>(ii) Forceps</td>
<td>18</td>
<td>52</td>
<td>17</td>
<td>87</td>
</tr>
<tr>
<td>(iii) Normal Delivery (ND)</td>
<td>166</td>
<td>1548</td>
<td>549</td>
<td>2263</td>
</tr>
<tr>
<td>(D) Anaemia</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Hb&lt;7g/dl)</td>
<td>108</td>
<td>133</td>
<td>77</td>
<td>318</td>
</tr>
<tr>
<td>Moderate (Hb 7.5-9.5g/dl)</td>
<td>26</td>
<td>53</td>
<td>29</td>
<td>108</td>
</tr>
<tr>
<td>Mild (Hb 10-10.9g/dl)</td>
<td>26</td>
<td>80</td>
<td>28</td>
<td>134</td>
</tr>
<tr>
<td>(E) Perinatal Outcome</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i) Full Term Delivery</td>
<td>7</td>
<td>41</td>
<td>9</td>
<td>57</td>
</tr>
<tr>
<td>(ii) Premature Delivery</td>
<td>295</td>
<td>1565</td>
<td>565</td>
<td>2425</td>
</tr>
<tr>
<td>(iii) Intrauterine Death (IUD)</td>
<td>23</td>
<td>39</td>
<td>17</td>
<td>79</td>
</tr>
<tr>
<td>(v) Stillbirth (SB)</td>
<td>6</td>
<td>33</td>
<td>15</td>
<td>54</td>
</tr>
<tr>
<td>(F) Maternal Outcome</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i) Preterm Labour</td>
<td>295</td>
<td>1565</td>
<td>565</td>
<td>2425</td>
</tr>
<tr>
<td>(ii) Post Partum Haemorrhage</td>
<td>16</td>
<td>84</td>
<td>30</td>
<td>130</td>
</tr>
<tr>
<td>(iii) Renal Failure</td>
<td>6</td>
<td>13</td>
<td>7</td>
<td>26</td>
</tr>
<tr>
<td>(iv) CVA (#)</td>
<td>63</td>
<td>27</td>
<td>40</td>
<td>130</td>
</tr>
<tr>
<td>(vi) DIC (S)</td>
<td>6</td>
<td>8</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>(vii) Gestational Diabetes Mellitus</td>
<td>106</td>
<td>57</td>
<td>23</td>
<td>186</td>
</tr>
<tr>
<td>(ix) Maternal Mortality</td>
<td>36</td>
<td>7</td>
<td>13</td>
<td>56</td>
</tr>
</tbody>
</table>

| (8) Cerebrovascular Accident, (S) Disseminated Intravascular coagulation |

5.20 116 (4.07%) cases were delivered by forceps. Among these 87 (3.05%) were of tribal group and 29 (1.01%) were of nontribal background.

5.21 2423 (85.19%) cases were delivered normally (ND). Among these 2263 (95.57%) were of tribal group and 160 (5.62%) were of nontribal background.
Cases of anemia in patients of Hypertensive Disorders of Pregnancy. Out of total 2844 cases of Hypertensive Disorders of Pregnancy Total 669 (23.52%) cases were anaemic. Among these 560 (19.67%) were in tribal group and 120 (4.21%) were in nontribal background.

Full term delivery occurred in 88 (3.09%) cases. Among these 57 (2.0%) were of tribal group and 31 (1.09%) were of nontribal background.

Premature delivery occurred in 2575 (90.54%) cases. Among these 2425 (82.26%) were of tribal group and 150 (5.27%) were of nontribal background.

121 (4.25%) cases had Intra Uterine Death (IUD) of foetus. Among these 79 (2.77%) were of tribal group and 42 (1.47%) were of nontribal background.

75 (2.63%) cases had still birth (SB). Among these 54 (1.89%) were of tribal group and 21 (0.73%) were of nontribal background.

150 (5.27%) cases had Postpartum Haemorrhage. Among these 130 (4.57%) were of tribal group and 20 (0.70%) were of nontribal background.

46 (1.61%) cases developed Renal Failure. Among these 26 (0.91%) were of tribal group and 20 (0.70%) were of nontribal background.

148 (5.20%) cases had cerebrovascular accident. Among these 130 (4.57%) were of tribal group and 18 (0.63%) were of nontribal background.

39 (1.37%) cases developed Disseminated Intravascular Coagulation (DIC). Among these 20 (0.70%) were of tribal group and 19 (0.66%) were of nontribal background.

220 (7.73%) cases developed Gestational Diabetes Mellitus. Among these 186 (6.54%) were of tribal group and 34 (1.19%) were of nontribal background.

Total Maternal Mortality was in 74 (2.60 %) cases. Among these 56 (1.96%) were of tribal group and 18 (0.63%) were of nontribal background.

6. DISCUSSION

6.1 Our study discloses that over a period of 5 year 6 months wef. July 2007 to December 2012, total 37240 obstetric cases were admitted and managed in Obstetrics & Gynecology indoor wards of Late Shri Bali Ram Kashyp Memorial Govt. Medical College, Jagdalpur, Bastar, Chhattisgarh). Out of these total 37240 cases, 2844 (n=2844) (7.6%) were cases of hypertensive disorders of pregnancy (Eclamptic and noneclamptic), these 2844 (n=2844) cases have included in this study.

6.2 This study disclosed that the overall incidence of Hypertensive Disorders of Pregnancy was 7.6%, including incidence 4.860 % of pre-eclampsia, 0.993 % of eclampsia and 1.744 %. of pregnancy induced hypertension. Out of total 2844 cases of Hypertensive Disorders of Pregnancy, 2610 (n=2610) (91.78%) were of tribal group and remaining 234 (n=234) (8.22%) in women of nontribal background. On further stratification it is revealed that among tribal total incidence of hypertensive disorders of pregnancy is 6.974. Out of this 484 cases of Preeclampsia 4.484, of Pregnancy induced Hypertension 1.619 and of eclampsia 0.871.Among women of nontribal background incidence is 0.625. Out of this of Preeclampsia 0.376, of Pregnancy induced Hypertension 0.125 and of eclampsia 0.122.

6.3 Burden of Preeclampsia: Worldwide, the incidence of preeclampsia ranges between 2% and 10% of pregnancies. The incidence of preeclampsia, the precursor to eclampsia, varies greatly worldwide. WHO estimates the incidence of preeclampsia to be seven times higher in developing countries (2.8% of live births) than in developed countries (0.4%).[5]

6.4 One of the reasons might be that now a day’s tribal population residing mostly in and around villages and cities and adapt the lifestyle similar to them, that is why they had almost similar risk factors associated with the prevalence of hypertension as rural and urban population had, as shown in other studies in general the people are mal-nourished.[6]

6.5 Tribal health problems: The primitive tribes in India have distinct health problems, mainly governed by multidimensional factors such as habitat, difficult terrains, varied ecological niches, illiteracy, poverty, isolation, superstitions and deforestation. The tribal people in India have their own life styles, food habits, beliefs, traditions and socio-cultural activities. The health and nutritional problems of the vast tribal populations are varied because of bewildering diversity in their socio-economic, cultural and ecological settings. However, data analysis in view of their ecological, ethnological, cultural and biological diversity is lacking in India.[7]

The health care services and challenges in rural and tribal areas are a complicated phenomenon such as:
- Concept of health and disease is rather traditional which results in their not seeking treatment at an early stage of physical maladjustment and frequent refusal of preventive measures in rural areas and their idea of medical care is some treatment not easily accessible and available. Lack of motivation of people for availing medical care at the initial stage of the disease.
- Limited paying capacity or habit of getting treatment always free of cost.
- Comparative inaccessibility of medical care services due to under-developed communication and transport facilities.
Nonavailability of qualified medical practitioner in the village. Qualified health workers and professional medical and paramedical staff do not want to work in rural and tribal areas because of professional, personal and social reasons. Nonavailability of private or governmental doctor as and when need arises. [7]

6.6 Nutrition deficiency is high among women and children. Malnutrition among the women is main reason for Low Birth Weight of children. To sum-up it can be said that the socio-economic status of the tribal in Bastar is far below the national standard. The low socio-economic condition is associated with poverty, lack of awareness about personal hygiene, health care & nutrition and livelihood skills to increase productivity using local resources. [8]

6.7 Role of Genetics in Preeclampsia: Although the risk factors for preeclampsia are both genetic and environmental, the presence of preeclampsia in first degree relatives increases a woman’s risk of preeclampsia by 2 to 4 fold. Genetic factors may play an important role in the angioenic imbalance found in patients with preeclampsia. Pathophysiology of Preeclampsia: Delivery of the placenta usually initiates the resolution of the acute clinical symptoms of preeclampsia, suggesting that the placenta plays a central role in preeclampsia pathogenesis. During normal pregnancy, the placenta undergoes dramatic vascularization to enable circulation between fetus and mother. The Role of Uteroplacental Ischemia: Altered uteroplacental blood flow has long been the focus of the pathophysiology of preeclampsia. Clinicians and research scientists have garnered a wealth of data to support the hypothesis that a reduction in uterine blood flow is the overriding factor in the etiopathogenesis of this condition. The placentae of women with preeclampsia are uniformly abnormal. [9]

6.8 In tribal group maximum 2101 (73.87%) cases were in 20-25 years of age, and 137 (4.83%) cases were in 26-27 age group, 115 (4.06%) in 28-29 age group, 200 (7.05%) in 30-35 age group and 57 (1.97%) in 40 years of age group. Similar finding; shared by. [10]

6.9 In tribal group maximum 2468 (86.77%) were noted in 22-34 week of preterm gestation, 115 (4.04%) were in full term gestation and remaining 27 (0.93%) were postpartum cases. Why does preterm birth happen? Preterm birth occurs for a variety of reasons. Most preterm births happen spontaneously, but some are due to early induction of labour or caesarean birth, whether for medical or non-medical reasons. Common causes of preterm birth include multiple pregnancies, infections and chronic conditions, such as diabetes and high blood pressure; however, often no cause is identified. There is also a genetic influence. [11] It is recognised that the postpartum period continues to pose a risk of pre-eclampsia, with up to 44 per cent of eclamptic convulsions occurring in this period. Most will occur within 48 hours after delivery, with only 26 per cent of seizures developing more than 48 hours after delivery. [12]

6.10 Highest 1978 (69.54%) cases of hypertensive disorder of pregnancy were primigravida. It is shared by. [10] Among 1978 (69.54%) primigravida cases maximum 1767 (62.13%) were in tribal group.

6.11 Cases of anemia in patients of Hypertensive Disorders of Pregnancy. Out of total 2844 cases of Hypertensive Disorders of Pregnancy Total 669 (23.52%) cases were anemic. Among these 560 (19.67%) were in tribal group and 109 (3.83%) were in nontribal group. The health and nutrition problems of the vast tribal population of India are as varied as the tribal groups themselves who present a bewildering diversity and variety in their socio-economic, sociocultural and ecological settings. Nutritional anaemia is a major problem for women in India and more so in the rural and tribal belt. This is particularly serious in view of the fact that both rural and tribal women have heavy work load and anaemia has profound effect on psychological and physical health. Anaemia lowers resistance to fatigue, affects working capacity under conditions of stress and increases susceptibility to other diseases. Maternal malnutrition is quite common among the tribal women especially those who have many pregnancies too closely spaced. Tribal diets are generally grossly deficient in calcium, vitamin A, vitamin C, riboflavin and animal protein. [13]

6.12 46 (1.61%) cases developed Renal Failure. Among these 26 (0.91%) were of tribal group and 20 (0.71%) were of nontribal background. There is also an increased risk for women with history of preeclampsia to develop end-stage renal disease (ESRD), though the absolute risk appears to be low. Women who had gestational proteinuria or preeclampsia before 30 weeks’ gestation were more likely to have had underlying renal disease. [9]

6.13 148 (5.20%) cases had cerebrovascular accident. Among these 130 (4.57%) were of tribal group and 18 (0.63%) were of nontribal background. Women with history of preeclampsia are at significantly increased risk to develop hypertension, ischemic heart disease, stroke, type II diabetes, and venous thromboembolism in comparison with women without history of the disease. [9]

6.14 Adverse outcomes related to hypertension in pregnancy can be divided into short-term versus long-term complications. While short-term complications can be further subgrouped into maternal and fetal complications, long-term outcomes are mainly maternal. The major adverse outcomes include central nervous system (CNS) injuries such as seizures (edamapsia).acute renal failure or so-called acute tubular necrosis to even irreversible renal failure secondary to renal cortical necrosis as well as increased frequency of cesarean delivery, preterm delivery, and abruptio placentae. [9]

6.15 Among these 79 (2.77%) were of tribal group and 42 (1.47%) were of nontribal background. 75 (2.63%) cases had still birth (SB) Among these 54 (1.89%) were of tribal group and 21 (0.73%) were of nontribal background. The effects of chronic, controlled hypertension in pregnancy on the fetus are minimal. However, Preeclampsia - eclampsia can lead to higher frequency of induced
labor, fetal growth restriction, neonatal respiratory difficulties, and increased frequency admission to neonatal intensive care unit. Hypertension in pregnancy, even in its more severe forms, causes only minimal increased risk for perinatal or foetal death. [9]

6.16 150 (5.27%) cases had Postpartum Haemorrhage. Among these 130 (4.57%) were of tribal group and 20 (0.70%) were of nontribal background. Total Maternal Mortality was in 74 (2.60%) cases. Among these 56 (1.96%) were of tribal group and 18 (0.63%) were of nontribal background. Hemorrhage and hypertensive disorders are major contributors to maternal deaths in developing countries. [14]

6.17 Gestational diabetes mellitus is a complication of pregnancy that is characterized by impaired glucose tolerance with onset or first recognition during pregnancy. It develops when the pancreatic β-cell reserve is not sufficient to compensate for decreased insulin sensitivity during pregnancy. As a consequence, there are greater postprandial increases in FFAs (Free Fatty Acids), increased hepatic glucose production, severe insulin resistance and subsequently increased blood glucose levels. The reported prevalence of GDM (Gestational diabetes mellitus) varies between 0.6% and 20% of pregnancies depending on screening method, gestational age and the population studied. [15]

6.18 Where do maternal deaths occur?: The high number of maternal deaths in some areas of the world reflects inequities in access to health services, and highlights the gap between rich and poor. Almost all maternal deaths (99%) occur in developing countries. More than half of these deaths occur in sub-Saharan Africa and almost one third occur in South Asia. [16]

6.19 Why do women die: Women die as a result of complications during and following pregnancy and childbirth. Most of these complications develop during pregnancy. Other complications may exist before pregnancy but are worsened during pregnancy. The major complications that account for 80% of all maternal deaths are: severe bleeding (mostly bleeding after childbirth), infections (usually after childbirth), high blood pressure during pregnancy (pre-eclampsia and eclampsia), and unsafe abortion. [16]

Recommendations for reducing the risk of Hypertensive disorders of pregnancy

6.20 There are a number of risk factors for Hypertensive Disorders in Pregnancy that may be determined early in a woman’s pregnancy.

6.21 Secondary prevention: It has been observed that patients’ reaching in tertiary level of care mostly in a stage when signs and symptoms of Hypertensive disorder are fully established. Secondary prevention is largely the domain of clinical medicine.

6.22 Obstetrics is largely a preventive medicine. We must discuss Recommendations for reducing the risk of Hypertensive disorders of pregnancy to ensure that throughout pregnancy and puerperium, the mother will have good health and that every pregnancy may culminate in a healthy mother and a healthy baby. Our main aim should be mainly directed towards Primary Prevention.

6.23 In Primary prevention apart from Population (mass) strategy, emphasis should be on “High risk strategy”. The specific interventions are early diagnosis e.g., screening test and adequate preventive treatment, so that the risk of Hypertensive disorders of pregnancy is reduced. Our study discloses that among tribal group pregnant women of early age (20-25 years), Primigravida/Nulliparas and those who are in preterm gestation fall in high risk group.

6.24 A well structured research work is needed to determine the Preconception risk factors e.g. partner risk factor, maternal-specific risk factor, Presence of specific underlying disorders and Pregnancy related risk factors and application of specific primary prevention in high risk tribal population. So that problem of hypertensive disorders in pregnancy (eclampsic or noneclampsic) can be ameliorated.

6.25 In conjunction with awareness generation, services and specific health protections for mothers the following recommendations mainly for primary prevention in high risk tribal population for reducing the risk of Hypertensive disorders of pregnancy are recommended:

6.26 In areas where dietary calcium intake is low, calcium supplementation during pregnancy (at doses of 1.5–2.0 g elemental calcium/day) is recommended for the prevention of pre-eclampsia in all women, but especially in those at high risk of developing pre-eclampsia. [17]

6.27 The issue of interaction between iron supplements and calcium supplements. In this regard the group noted that concomitant administration of the two should be avoided. Ideally, the two supplements should be administered several hours Apart (e.g. morning and evening). With regard to the timing of initiation of calcium supplementation, in most of the trials included in the Cochrane review it was started around 20 weeks of gestation. [17]

6.28 Low-dose acetylsalicylic acid (aspirin, 75 mg/day) is recommended for the prevention of pre-eclampsia in women at high risk of developing the condition. [17]

6.29 Low-dose acetylsalicylic acid (aspirin 75 mg/day) for the prevention of pre-eclampsia and its related complications should be initiated before 20 weeks of pregnancy. [17]

6.30 Magnesium sulphate is recommended for the prevention of eclampsia in women with severe pre-eclampsia in preference to other anticonvulsants. [17]

6.31 In women with severe pre-eclampsia at term, a policy of early delivery is recommended. In women with mild pre-eclampsia or gestational hypertension at term, induction of labour is recommended. [17]
9.32 Dietary supplements may be relevant for preeclampsia prevention, and they extend them to suggest that regular use of a multivitamin in the periconceptional period may reduce the risk of preeclampsia, particularly among lean women.[18]

7. Conclusion:

Evidence in this study suggest that among tribal women total incidence of Hypertensive disorders of pregnancy (HDP) is much higher and maximum cases were in 20-25 years of early age group, primigravid/nullipara and those in preterm gestation. Morbidity and mortality associated with hypertensive disorders of pregnancy are the most difficult to prevent. A well structured research work is needed to determine the Preconception risk factors e.g. partner risk factor, maternal-specific risk factor, Presence of specific underlying disorders and Pregnancy related risk factors and application of specific primary prevention in high risk tribal population. So that problem of hypertensive disorders in pregnancy (eclamptic or noneclamptic) can be ameliorated

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