ABSTRACT

BACKGROUND: To assess and compare the utilization pattern of antihypertensive drugs in antenatal patients with PIH in Govt. as well Private hospitals of Rajkot city. MATERIALS AND METHODS: This prospective record based observational study was carried out in antenatal clinic of P.D.U. Govt. hospital and five different private obstetric clinics of Rajkot city from March 2011 to July 2012. Antenatal patients diagnosed as PIH by an obstetrician were included as per inclusion and exclusion criteria. Data were collected and analyzed for drug utilization pattern of antihypertensive at initiation and during entire study period, BP reduction after 6 weeks of therapy, commonly prescribed drugs with their teratogenic risk category as well as for WHO drug use indicators. RESULTS: Total 193 patients from Govt. as well as from private hospital were included for analysis. At the initiation and during entire study period, Methyldopa was the commonest prescribed antihypertensive in monotherapy as well as combination in both Govt. and Private hospitals, followed by Nifedipine and then Labetalol. Average number of drugs per encounter was 4.34 and 4.64 in Govt. and Private hospital, respectively. 10 out 17 drugs were included in WHO EML 17th, while NLEM 2011 included 13 out of 17 drugs. Majority of prescribed drugs were included in FDA teratogenic risk category A and B. CONCLUSION: Methyldopa was the commonly prescribed antihypertensive in monotherapy as well as combination for PIH in Govt. as well as in private hospital of Rajkot city.

Keywords: Drug utilization study, pregnancy induced hypertension, antihypertensive drugs

INTRODUCTION

Hypertensive disorders in pregnancy are one of the major complications having adverse fetal as well as maternal outcome to pregnancy. The incidence ranges from 6-10% and varies among different hospitals, regions and countries. It has been noted that prompt control of blood pressure and clearance of proteinuria are two major factors help to prevent adverse outcome. According to National High Blood Pressure Education Programme Working Group guidelines systolic blood pressure above 140 mm of Hg and diastolic above 90 mm of Hg are the criteria to start the antihypertensive treatment in pregnancy induced hypertensive patients.

Utilization spectrum of antihypertensive drugs during pregnancy is relatively narrow and prescribing pattern differs from regions, countries as well as in different hospitals. Drug utilization research is an essential part of pharmacoepidemiology as it describes the extent, nature and determinants of drug exposure. This study was aimed to assess and compare the utilization pattern of antihypertensive in antenatal patients with PIH in Govt. as well Private hospitals of Rajkot city.

MATERIALS AND METHODS

This was a record based observational prospective study conducted from March 2011 to July 2012 at the Antenatal care centre (Mamta clinic) under Department of Obstetrics and Gynecology, P.D.U. Govt. Medical College and Hospital, Rajkot as well as five private Obstetrics clinics of Rajkot city. Approval from Institutional Ethics Committee of P.D.U. Govt. Medical College, Rajkot was taken before the conduct of the study. Antenatal patients according to inclusion and exclusion criteria were enrolled in the study and informed consent was obtained.

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Inclusion Criteria
Antenatal patients who diagnosed as having PIH by an obstetrician and came for at least 3 follow ups were included.

Exclusion Criteria
Patients with other cardiovascular diseases and patient lost to follow up as well as refused to give written consent were excluded.

Data collection
After the diagnosis of PIH and prescription of treatment by the obstetrician, all the details regarding personal details, past history, personal history, obstetric history, present complains, investigations and given treatment were recorded from clinical OPD case file in case record form. Patient was advised by an obstetrician to come for follow up every month from 20 to 28 weeks of pregnancy. From 28 weeks onwards, follow up was advised every 15 days till 32 weeks and thereafter every week till delivery. Follow up data were recorded in case record form regarding gestational age, weight, urine albumin, blood pressure and given treatment.

Data analysis
Data were analyzed for selection of antihypertensive drug at the time of diagnosis, whether monotherapy or combination, utilization of antihypertensive during entire study period, BP reduction after 6 weeks of therapy and commonly used drugs in antenatal patients of PIH. Analysis of WHO drug utilization core indicators like total and average number of drug per encounter, percentage of drugs prescribed by generic name, percentage of drugs prescribed according to Essential Medicine List were also done. Each parameter of analysis was compared between Govt. and Private hospital data. Graphpad Instat version 3.10 and Microsoft Excel 2007 were used for analysis.

RESULTS
Out of total 193 patients, 89 patients were from Govt. Hospital and 104 were from five Private obstetrics clinics. Table 1 shows primary details of patients from both hospitals.

88.76% and 84.61% patients from Govt. and Private hospital respectively were given only one antihypertensive drug at the initiation of therapy. Combination therapy of antihypertensive was prescribed initially in 11.23% of patients from Govt. hospital and 15.38% patients from Private hospital. Initially 14.42% patients from Govt. hospital (15 out of 104) were advised only salt restricted diet for control of blood pressure; they were excluded from the final analysis.

As shown in Figure 1, at the initiation, Methyldopa was the commonest prescribed antihypertensive as monotherapy as well as in combination in Govt. and Private hospital both (65.16% patients of Govt. and 59.61% patients of Private hospital), followed by Nifedipine which was prescribed in 20.22% of Govt. and 18.26% of Private hospital patients. Use of Labetalol as monotherapy was more in Private hospital patients (6.73%) as compared to Govt. hospital patients (1.12%). Among combination therapy, Methyldopa and Nifedipine combination (7.86% in Govt. and 8.65% in Private hospital patients) was prescribed most commonly, followed by Methyldopa and Labetalol combination and then Nifedipine and Labetalol combination. Three drugs combination was prescribed in only one patient of Govt. hospital (1.12%).[Mdopa- Methyldopa, NF-Nifedipine, Labet- Labetalol]

Figure 2 shows encounter wise distribution during entire study period. It also shows that Methyl dopa was prescribed in highest number (67.49% of Govt. hospital prescriptions and 72.97% of Private hospital prescriptions), followed by Nifedipine (72.97% of Govt. hospital prescriptions and 72.97% of Private hospital prescriptions), followed by Nifedipine (27.55% of Govt. hospital prescriptions and 30.11% of Private hospital prescriptions), than Labetalol.
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(8.04% of Govt. hospital prescriptions and 14.28% of Private hospital prescriptions). 63 out of 89 (70.78%) patients from Govt. hospital and 82 out of 104 (78.84%) patients from Private hospital had taken antihypertensive treatment for six weeks. Rest of the patients had less than six weeks of duration between diagnosis and delivery, so

Table 1: Primary details of the patients

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Govt. Hospital</th>
<th>Private Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age (years)</td>
<td>25.32 ± 3.96</td>
<td>25.60 ± 3.37</td>
</tr>
<tr>
<td>Educational status</td>
<td>Secondary</td>
<td>Secondary</td>
</tr>
<tr>
<td>Mean gestational Age (weeks)</td>
<td>28.84 ± 5.70</td>
<td>27.92 ± 5.25</td>
</tr>
<tr>
<td>Past history of PIH</td>
<td>45.06%</td>
<td>46%</td>
</tr>
</tbody>
</table>

Table 2: Absolute reduction in the blood pressure by antihypertensive therapy

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Govt. Hospital</th>
<th>Private Hospital</th>
<th>p &lt; 0.0001 (extremely significant)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>At the start of treatment (n=61)</td>
<td>At the end of six weeks (n=61)</td>
<td>Difference</td>
</tr>
<tr>
<td>Mean MBP</td>
<td>110.84</td>
<td>99.84</td>
<td>11</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>±7.35</td>
<td>±4.69</td>
<td>±2.66</td>
</tr>
</tbody>
</table>

(P value – 0.000039 which is less than 0.0001 showing extreme significant results)

Table 3: Total number of drugs prescribed per encounter

<table>
<thead>
<tr>
<th>Number of drugs per encounter</th>
<th>Govt. Hospital</th>
<th>Private Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of encounters</td>
<td>Total number of drugs prescribed</td>
</tr>
<tr>
<td>4</td>
<td>459 (71.05%)</td>
<td>1836</td>
</tr>
<tr>
<td>5</td>
<td>156 (24.14%)</td>
<td>780</td>
</tr>
<tr>
<td>6</td>
<td>27 (4.17%)</td>
<td>162</td>
</tr>
<tr>
<td>7</td>
<td>4 (0.61%)</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td>646 (100%)</td>
<td>2806</td>
</tr>
</tbody>
</table>

they were excluded from statistical analysis of blood pressure reduction. Mean blood pressure at start and after six weeks of therapy was assessed for their normal distribution using normality test. As data didn’t follow normal distribution it was further analyzed using non parametric test, Mann Whitney test (p value < 0.05 was considered significant). Table 2 shows that there is statistically extremely significant reduction in mean blood pressure in comparison to baseline, both in Govt. as well as Private hospital after six weeks of antihypertensive treatment. During entire study period as shown in Table 3, there were total 646 encounters containing 2806 drugs in Govt. hospital, while the in Private hospital, total 840 encounter contained 3905 drugs. Prescriptions containing four drugs were most common in both hospitals, followed by five drug prescription. Average number of drugs per encounter was 4.34 and 4.64 in Govt. and Private hospital, respectively. Commonly used drugs prescribed in Govt. patients on OPD basis were iron preparations, multivitamin, calcium supplements, low dose aspirin, ranitidine, paracetamol, amoxicillin, betamethasone ointment, calamine lotion, chlorpheniramine and levothyroxine. As compared to Govt. hospital, in Private hospital patients iron preparations, multivitamins, calcium supplements, low dose aspirin, esomeprazole, cefixime, levocetirizine were prescribed. None of the prescribed drugs were from teratogenic category D and X. 562 (86.99%) out of 646 drugs in Govt. hospital and 145 (17.26%) out of 840 drugs in
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private hospital were prescribed by generic name. 10 out of 17 drugs (58.82%) were listed in WHO model list of essential medicines, 17th edition (updated) March 2011. According to National list of essential medicines, India, 3rd edition, 2011, 13 out of 17 drugs (76.47%) were essential drugs.

DISCUSSION
In our study, as described earlier 75.96% and 84.61% patients from Govt. and Private hospital respectively, were given only one antihypertensive drug at the initiation of therapy. A study conducted by Cvijic M et. al showed the similar results as 62.5% patients had received monotherapy. Methyldopa was the commonest prescribed antihypertensive as monotherapy as well as in combination in Govt. and Private hospital both. (65.16% in Govt. and 59.61% in Private). Similarly in a study by Cvijic M et. al, Methyldopa was most commonly prescribed antihypertensive drugs in 27.8% of patients.

In contrast to this, studies from Hooly TV et al and Ray JG et al showed Nifedipine was most frequently prescribed antihypertensive than Methyldopa. Hooli TV et. al showed Nifedipine (84.5%) is the most frequently prescribed drug and although Methyldopa is one of the safest antihypertensive, it was prescribed only in 4% of patients. Ray JG et. al showed in their study that Nifedipine (47.7%) was prescribed more frequently than Methyldopa (27.7%). This shows that utilization pattern differs from hospitals, prescribers and among countries also. In our study, average number of drugs per encounter were in excess (4.34 in Govt. hospital and 4.64 in Private hospital) as compared to study by Hooli TV et al (2.47 drugs per encounter), as nutritional supplements (iron, calcium, multivitamin) were prescribed in three different formulations. In our study, prescriptions from Govt. hospital were by generic name, where Private practitioners preferred prescription by brand name. 58.82% of prescribed drugs were included in WHO Essential Medicine List, 17th edition (March 2011). Hooli et al showed drugs prescribed from generic name and from EML were 1.89% and 49.59%.

CONCLUSION
Methyldopa was the commonest prescribed antihypertensive in monotherapy and combination, as it is safest during pregnancy. Overall reduction in blood pressure achieved by antihypertensive drugs was statistically significant. 10 out of 17 prescribed drugs are included in WHO Essential Medicine List 17th edition, which is appreciable. None of the prescribed drugs were from teratogenic category D and X.

ACKNOWLEDGMENT
I would like to convey my thanks and regards to Dr. J. G. Buch, (Professor and Head, Department of Pharmacology, GMERS Medical College, Gandhinagar and Ex- Professor and Head, Department of Pharmacology, P.D.U. Govt. Medical College, Rajkot) for his help and guidance in the initiation of this study.

REFERENCES