Can azithromycin be substituted for amoxycillin in upper respiratory tract infections? An observation based on a drug utilization at some primary health centers

Drug utilization studies in general and prescription analysis in particular are very useful tools to detect inappropriate use of medicines. Upper respiratory tract infection (URTI) is one of the commonest diagnoses at primary health centers (PHCs), which are often treated with antibiotics. The present study was conducted at three randomly selected primary health centers, selected through lots, situated in the Jamnagar district, Gujarat state with the objective of comparing azithromycin with the most commonly prescribed antibiotic in URTIs with an aim to provide some useful recommendations in the future.

Retrospective data were collected from three PHCs among 36 PHCs situated in this region in the month of January 2006 using pre-designed and pre-tested proforma. Five days’ data were collected from case records of all the patients attending outdoor patient departments (OPDs) at each primary health center according to a proforma. The proforma included disease condition, patient information (i.e., age and sex of the patient) and drug information (i.e., name and quantity of the prescribed drug).

Out of the total 728 case records, 376 (51.63%) and 352 (48.35%) belonged to male and female patients, respectively. Totally, 1838 drugs were prescribed. Non-steroidal anti-inflammatory drugs (NSAIDs), antibiotics, antihistaminics, gastro-intestinal drugs, glucorticoids and antimalarials were the most frequently used by PHCs in decreasing order.

Average number of drugs per encounter was 2.52. The percentage of encounters with an antibiotic (47.53%) was slightly higher compared to other studies (45%). Majority of antibiotics (44.89%, n = 372) prescribed in the three PHCs were for patients with URTIs (167 out of 180 URTI cases) during the present study. Amoxycillin was the most frequently used antibiotic for the treatment of URTIs (46.11%, Table 1). There is a need to restrict the use of antibiotics in URTI since the effectiveness of antibiotics in many of these cases is questionable as most of them are usually viral origin and self-limiting. Additionally, injudicious antibiotic use leads to increased cost and development of bacterial resistance.

Common use of amoxycillin among the prescribed antibiotics in URTIs in our study as well as in various other studies[2-4] led us to the idea of comparing it with another more suitable antibiotic i.e., azithromycin which not only is effective against most common upper respiratory bacterial pathogens such as group A streptococci, S. pneumoniae, H. influenzae and M. catarrhalis,[5] but also has a good safety profile.[6]

At most PHCs, drugs are dispensed only for two-three days at a stretch. Therefore, prescribing an antibiotic like amoxycillin, which needs a course of 7-10 days, decreases patient compliance. In such situations, it is preferable to prescribe an antibiotic, which needs to be given only for three days, like azithromycin to ensure better patient compliance and reduce the chances of development of bacterial resistance. It also has the added advantage of once daily administration.

Azithromycin was also found to be much cheaper than amoxycillin [Table 2]. Overall cost comparison[7] shows a difference of Indian rupees (INR) Rs. 19-64 (46-62%) between amoxycillin and azithromycin. This means that, for every 100 cases of URTIs requiring antibiotics we can save Rs. 1900-6400 (approx.). Thus, the yearly cost saving for a PHC could be approximately Rs. 57,000-1,90,000 (approximate 10 URTIs cases per day to a PHC, i.e., 25×10=250 cases per month).

The major limitations of this study are a very short data collection period (only five days), a small sample size and different age groups of patients and the seasonal variation that could affect the incidence and perhaps the severity of URTIs. In addition, lack of information about definite bacterial etiology and consequently the prevalent organisms responsible for the URTIs in the community are the other lacunae of the study.

Also, the number of PHCs included in the study represents only a small part of the district. Therefore the information gathered from this study can be used to plan formal long-term studies at more centers. However, even from the results

### Table 1

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>n (%), (n*=167)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amoxycillin</td>
<td>77 (46.11)</td>
</tr>
<tr>
<td>Co-trimoxazole</td>
<td>32 (19.16)</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>14 (8.38)</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>11 (6.59)</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>10 (5.99)</td>
</tr>
<tr>
<td>Cephalaxin</td>
<td>10 (5.99)</td>
</tr>
<tr>
<td>Erythromycin</td>
<td>9 (5.39)</td>
</tr>
<tr>
<td>Roxithromycin</td>
<td>4 (2.40)</td>
</tr>
</tbody>
</table>

n (%) = Number (percentage), n*= Total number of URTIs cases treated with antibiotics.

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Indian J Pharmacol  | February 2007  | Vol 39 | Issue 1 | 55-56 | 55
Table 2
Comparison between amoxycillin and azithromycin in respect to cost of therapy for treatment of upper respiratory tract infections

<table>
<thead>
<tr>
<th></th>
<th>Amoxycillin</th>
<th></th>
<th></th>
<th>Azithromycin</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Q*</td>
<td>Price (Rs.)</td>
<td>Cost of Therapy</td>
<td>Q*</td>
<td>Price (Rs.)</td>
<td>Cost of Therapy</td>
<td>Diff (Rs.)</td>
</tr>
<tr>
<td>500 mg Cap</td>
<td>10</td>
<td>49.10</td>
<td>103.11</td>
<td>3</td>
<td>39.00</td>
<td>39.00</td>
<td>64.11</td>
</tr>
<tr>
<td>125 mg kid Tab</td>
<td>10</td>
<td>15.00</td>
<td>31.50</td>
<td>3</td>
<td>11.70</td>
<td>11.70</td>
<td>19.80</td>
</tr>
<tr>
<td>125 mg/5 mL Dsyr</td>
<td>60 ml</td>
<td>23.40</td>
<td>40.95</td>
<td>15 ml</td>
<td>22.10</td>
<td>22.10</td>
<td>18.85</td>
</tr>
</tbody>
</table>

*Quantity, ∗seven days’ cost of therapy with amoxycillin (recommended duration of treatment with amoxycillin for URTIs: 7-10 days), ∗Three days’ cost of therapy with azithromycin, ∗Difference of cost of therapy between amoxycillin and azithromycin.

of this study, it could be surmised that azithromycin is perhaps a better first line drug for the treatment of URTIs which require antibiotics and should be considered when preparing the essential drugs list for PHCs.

Acknowledgement
We are thankful to Dr. B. N. Vyas, Epidemic Medical Officer (EMO), Bhavnagar, Gujarat for his help in preparing the proforma of the study.

D.M. Parmar, S.P. Jadav, B.K. Shah*  
Department of Pharmacology, M.P. Shah Medical College, Jamnagar, *Department of Pharmacology, C.U. Shah Medical College, Surendranagar, Gujarat, India. 
E-mail: drdinesh06@rediffmail.com

References

Announcement

17th Annual State Conference of IPS
West Bengal branch

Date : 24th February, 2007
Place : Department of Pharmacology, Medical college, Kolkata-73.

For further information, contact :

Dr. Arup Moitra,  
Organizing Secretary,  
Mobile : 09433071321.

Dr. T.K. Mandal  
Secretary, IPS  
West Bengal Branch  
E-mail: drtkm@rediffmail.com