An Outbreak of Cholera in the Sangli District of Maharashtra

Dear Editor,

Cholera outbreaks have been frequently reported from one or the other part of this country especially during monsoon. However, the outbreaks are not strictly limited to this period. Cholera outbreaks are also related to major religious gatherings like melas, yatras etc. Occasionally sporadic cases have given rise to large epidemics due to lack of proper sanitation and timely preventive measures.\(^1\)\(^5\)

El Tor *Vibrio cholerae* have replaced their classic counterpart over the last few decades. Many recent reports of cholera outbreak in various parts of Indian subcontinent have been due to El Tor *Vibrio cholerae*.\(^1\) A similar outbreak emerged in the Sangli district of Maharashtra state during February and March 2005.

A total of 274 stool samples from patients with acute watery diarrhea admitted to Padmabhushan Vasantdada Patil Govt. Hospital, Sangli and Govt. Medical College Hospital, Miraj were bacteriologically investigated. Hanging drop examination of all the stool samples was performed. A total of 81 strains of El Tor *Vibrio cholerae* (Ogawa) were isolated and identified using antisera provided by Central Research Institute, Kasauli.

Sixty-nine out of the total 274 samples were positive for darting motility on hanging drop examination and 181 were negative. Hanging drop could not be performed on 24 samples.
as they were formed stool. Of the sixty-nine hanging drop positive samples, 60 were culture positive. Of the 181 hanging drop negative samples 21 were culture positive and 113 were culture negative and in remaining samples culture could not be performed for certain technical difficulty. Thus, out of the 81 culture positive samples 60 were positive and 21 were negative for darting motility by hanging drop examination (Table).

All the isolates were tested for antimicrobial susceptibility to ampicillin (10 µg) gentamicin (10 µg), chloramphenicol (30 µg) and tetracycline (30 µg) on Mueller Hinton agar by Kirby Bauer disk diffusion method. Ten isolates showed moderate sensitivity to tetracycline by disc diffusion method. MIC was performed for all the isolates showing moderate sensitivity to tetracycline as well as for ten isolates, which were sensitive to tetracycline by disc diffusion method. All the strains, which were moderately sensitive to tetracycline by disc diffusion method had an MIC for tetracycline of 8 µg/mL (turbidity at 16 µg/mL and no turbidity at 8 µg/mL). The tetracycline sensitive strains had an MIC between 4 µg/mL to 1 µg/mL.

All the isolates were sent to the National Institute of Cholera and Enteric Diseases (NICED), Kolkata for confirmation and phage typing. Phage typing of 67 strains is available till date. All the 67 strains were Basu and Mukherjee type 2. By new scheme the 59 strains were typed as serotype 27, five as serotype 26 and one each of serotypes 16, 24 and 25. Phage typing reports of 14 strains are awaited.

These cases indicate only the tip of the iceberg because many cases were admitted for acute diarrhoeal disease in private hospitals during the same period. But these were not cholera confirmed as the samples were not tested for the presence of Vibrio cholerae by culture.

The most rapid presumptive method to identify the presence of the vibrios in the stool sample is to observe for the darting type of motility in the hanging drop preparation of the stool samples. In our study we found the sensitivity of hanging drop method to be 74% and specificity to be 92% considering culture as gold standard. Though this method provides a rapid presumptive diagnosis of cholera in most of the cases, the diagnosis needs to be confirmed by culture. Moreover the decision about the management should not be based on the result of this test. The *in vitro* resistance to tetracycline was found to be 15%.

Prior to the present outbreak two strains of El Tor *Vibrio cholerae* Ogawa belonging to phage type 2 (Basu and Mukherjee) were isolated in January 2005. It is well known that incidence of cholera depends on the presence of the causative organism, the opportunities available for transmitting it and the immunological experience of the population (immune status or herd immunity of the patients to *V. cholerae*). In the developing world where sustained transmission is possible, a single case or small outbreak can lead to a larger epidemic. In the present outbreak also two sporadic cases have occurred in January 2005, a month before the epidemic. It is known that cholera epidemics occur where there is admixture between drinking water and sewage due to breaches in the pipelines. It was in fact revealed later on that there existed this type of drinking water contamination in municipal water supply. This was because of the old plumbing system. Because of the outbreak, the local government took cognizance of the situation and a grant was sanctioned to repair and replace the damaged plumbing. Sampling of the water from public supply was done by the public health laboratory. However, the reports are not known to the authors. It is quite possible that lack of sanitary facilities played an important role in spread of cholera after these sporadic cases.

In the present study all the isolates were El Tor Ogawa and most belonged to new phage type 27. None of our isolates were found to be O 139 *V. cholerae*. Though it has raised a great concern forecasting eighth pandemic due to the Bengal strain, El Tor Vibrios still are prevalent in various parts of India.

The most important responsibility of the laboratory is to define the beginning of the epidemic, monitor the changes in antimicrobial resistance during the epidemic and also to confirm that an epidemic is over. The emergence of resistance to various antibiotics amongst vibrios is now well-documented. The emergence of such resistance may significantly influence the control strategies in the future outbreaks. Therefore continued monitoring and surveillance of all cholera outbreaks becomes a necessity.

References


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**Table: Relationship between type of stool, hanging drop results and culture**

<table>
<thead>
<tr>
<th>Total samples (n = 274)</th>
<th>Hanging drop positive (n = 69)</th>
<th>Hanging drop negative (n = 181)</th>
<th>Formed stool (n = 24)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culture positive (n = 81)</td>
<td>60</td>
<td>21</td>
<td>0</td>
</tr>
<tr>
<td>Culture negative (n = 127)</td>
<td>9</td>
<td>113</td>
<td>5</td>
</tr>
<tr>
<td>Culture not requested (n = 66)</td>
<td>0</td>
<td>47</td>
<td>19</td>
</tr>
</tbody>
</table>

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Dear Editor,

As susceptibility pattern varies in different places of India, it is observed that unlike other Salmonella serotypes, S. paratyphi A and B are highly susceptible to ciprofloxacin, cephotaxime and ceftriaxone. Moreover, ampicillin and chloramphenicol, because of their high susceptibility against S. paratyphi, may be tried in ciprofloxacin resistant cases. Since 1996, an unusually high rate in isolation of S. paratyphi A and B has been reported from Nagpur (46.15%) and Sevagram (53.33%). Between 2001 to 2003, we isolated few strains of S. paratyphi A and B causing enteric fever and treated in Ispat General Hospital, Rourkela. Blood cultures of the patients were positive. Serotyping was done at the National Salmonella Phage Typing Centre, Lady Hardinge Medical College, New Delhi.

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*Corresponding author (email: <san_katul@sancharnet.in>)

References


*RD Kulkarni, SA Patil, VA Kulkarni, M Ramteerthakar, V Kumbhar, SR Shah, PA Joshi, VL Jahagirdhar
Department of Microbiology, Government Medical College, Miraj - 416 410, Maharashtra, India