

## CASE REPORTS

# SALMONELLA WIEN FROM GASTROENTERITIS CASES ENCOUNTERED IN MANGALORE, INDIA: A REPORT OF 10 CASES AND REVIEW OF THE LITERATURE

BEENA ANTONY, BIBIN SCARIA, MEENA DIAS, HILDA PINTO

### ABSTRACT

*Ten cases of gastroenteritis due to S. Wien were reported from a tertiary care hospital in Mangalore, in the month of April 2008. Biochemically, it resembles S. Paratyphi B or S. Typhimurium. Serotyping was done at the Central Research Institute, Kasauli, to confirm the identity. The food source is more likely to be chicken or some poultry products. All the 10 cases recovered with symptomatic treatment including antimicrobials like fluoroquinolones. To the best of our knowledge, no documented report is available from India regarding the prevalence of this organism in humans.*

**Key words:** Gastroenteritis, non-typhoidal salmonellosis, *Salmonella wien*

DOI: 10.4103/0019-5359.53165

### INTRODUCTION

Increasing incidence of non-typhoidal salmonellosis has become a public health problem. Occasional reports regarding changing pattern of *Salmonella* serovars from various geographical areas appear in the literature. *S. wein* is considered as one of the epidemic clones among the non-typhoid salmonellae, which spread from north Africa through Europe in the 1970s.<sup>[1]</sup> The pathogenicity of *S. Wien* is limited to few reports from the western countries, which include a nosocomial outbreak of acute

gastroenteritis reported in a neonatal intensive care unit in Tunisia by multi-drug-resistant *S. Wien*,<sup>[2]</sup> as well as 4 cases of purulent otitis media. International Surveillance Network for the Enteric Infections reported an increased incidence of *S. Wien* in the first quarters of 1998 and 1999.<sup>[3]</sup>

Occurrence of gastroenteritis in human infection due to *S. Wien* is almost unknown in India. We report here 10 cases of *S. Wien* isolated from gastroenteritis cases in the month of April 2008 in a tertiary care hospital in Mangalore.

### CASE REPORT

Non-typhoidal salmonellae were isolated from 10 patients of gastroenteritis admitted to a tertiary care hospital in Mangalore, in the month of April 2008. All 10 patients had a history of

Department of Microbiology, Fr. Muller Medical College, Mangalore, Karnataka, India

#### Correspondence:

Dr. Beena Antony  
Department of Microbiology, Fr. Muller Medical College,  
Kankanady, Mangalore - 575 002, India.  
E-mail: beenafmmc@gmail.com

loose stools with varying frequency, the highest being 8-9 episodes per day. Six of the patients had vomiting, 4 had abdominal cramps, 3 had fever and 2 had headache. Out of the 10 patients reported in the study, 6 were males and 4 were females. Except one 7-year-old child, all were adults and 5 of them were above 50 years of age.

Stool samples from these patients were subjected to microscopy, culture and enrichment technique. Non-lactose-fermenting motile gram-negative bacilli, which grew as black-centered colonies on Deoxycholate Citrate Agar (DCA), were identified as species of non typhoidal salmonella according to the standard procedures. Biochemical reactions were suggestive of *S. Paratyphi B* or *S. Typhimurium*. However, the isolates agglutinated with group-specific salmonella poly "O" antiserum (Remel, Europe Ltd., Dartford, Kent, UK) but did not agglutinate with the type-specific flagellar antisera of *S. Paratyphi B* or *S. Typhimurium*. The isolates were sent for confirmation and serotyping to the National Salmonella and Escherichia Reference Centre, Central Research Institute, Kasauli, Himachal Pradesh, and were identified as *S. Wien* with an antigenic structure 4, 12:b:1,w.

The antimicrobial susceptibility testing was performed by the standard disc-diffusion technique using commercial discs (Hi Media Pvt. Ltd., Mumbai), according to the Clinical Laboratory Standards Institute recommendations.<sup>[4]</sup> The antibiogram revealed that all the isolates were sensitive to ampicillin (10 µg), amoxycillin-clavulanic acid (20/10 µg), ciprofloxacin (5 µg), chloramphenicol (30 µg), cotrimoxazole (1.25/23.75 µg), cefotaxime (30

µg), ceftriaxone (30 µg) and nalidixic acid (30 µg). The strains were also tested for extended-spectrum β-lactamase by double-disc synergy test using ceftazidime (30 µg) and Ceftazidime-Clavulanic acid (30/10 µg) discs<sup>[4]</sup> and found to be negative.

## DISCUSSION

Non-typhoidal salmonellae are implicated as significant pathogens in food-borne gastroenteritis.<sup>[5]</sup> *S. Wien* is one of the rare serovars of this group, reported from the European countries and from Italian regions like Gela, Campania in the 1970s.<sup>[1]</sup> No documented report is available from India regarding the prevalence or distribution of this organism in the recent past. The internet search for English-language manuscripts through PubMed, Google Scholar and MedInd could bring out only 2 reports regarding *S. Wien* from the Indian literature. The first one is the isolation of *S. Wien* from poultry in India,<sup>[6]</sup> and the second one is about the genetic studies on the coexistence of Col plasmids and R plasmids in *S. Wien* and *S. Alachua*.<sup>[7]</sup>

Multi-drug-resistant *S. Wien* which produces β-lactamase<sup>[2,8,9]</sup> is a matter of concern for the clinicians and microbiologists. Lefevre observed imipenem resistance in *S. Wien* and attributed it to the Porin loss and CMY-4 β-lactamase production.<sup>[8]</sup> However, all the 10 strains isolated in our study were sensitive to all the drugs routinely used for the treatment of salmonellosis and were negative for extended-spectrum β-lactamases. All 10 patients recovered with symptomatic treatment including rehydration and fluoroquinolones.

The clinical findings of gastroenteritis reported in this series are similar to those of any other salmonella gastroenteritis. All the patients were residents of Mangalore and were non-vegetarians, taking both chicken and fish. However, the causative food could not be pointed out, except in one case, which developed symptoms after eating fish. Poultry is reported as the most common reservoir of Salmonella in various studies.<sup>[6,10]</sup> Hence in our case series, chicken or other poultry products being the causative food is more likely. The cases were reported in the month of April, which is in the summer season and also the festive Easter season.

This report emphasizes the geographical distribution of *S. Wien* in coastal Karnataka region and the need for including this organism in the spectrum of potential pathogens causing gastroenteritis in India. As *S. Wien* resembles other salmonella species like *S. Paratyphi B*, *S. Typhimurium* or *S. Weltevreden* biochemically, strict microbiological vigilance to perform serotyping is required to avoid under-reporting of this bacterium.

## REFERENCES

1. Nastasi A, Massenti MF, Hammina C, Villafrate MR, Cannova L. Salmonella serovars identified at the Centre for Enterobacteriaceae of Palermo over 5 year period 1983-87. *Eur J Epidemiol* 1990;6:212-8.
2. Hammami A, Ariet G, Redjeb SB, Grimont F, Hassen AB, Rekik A, *et al.* Nosocomial outbreak of acute gastroenteritis in a neonatal intensive care unit in Tunisia caused by multiply drug resistant Salmonella Wien producing SHV-2 B lactamase. *Eur J Clin Microbiol Infect Dis* 1991;10:641-6.
3. Enter-net Quarterly Salmonella Report -99/1 -issued by the International Surveillance network for the Enteric Infections- Salmonella and VTEC 0157. Available from: [http://ecdc.europa.eu/documents/pdf/ENTER\\_NET/99q/summ.pdf](http://ecdc.europa.eu/documents/pdf/ENTER_NET/99q/summ.pdf) [accessed on 2009 Mar 31].
4. Clinical and Laboratory Standards Institute. Performance Standards for Antimicrobial Susceptibility Testing; Sixteenth Informational Supplement. CLSI document M100-S16. Clinical and Laboratory Standard Institute, Pennsylvania, USA: 2006.
5. Wilson JS, Hazel SM, Williams NJ, Phiri A, French NP, Hart CA. Non typhoidal Salmonellae in United Kingdom Badgers: Prevalence and Spatial Distribution. *Appl Environ Microbiol* 2003;69:4312-5.
6. Kumar AA, Sawhney AN. Salmonellae affecting Poultry in India: Isolation of *S. Lomita* and *S. Wien*. *Indian Vet J* 1970;47:701-2.
7. Bhat MB, Sharma KB. Genetic studies on the co-existence of col -plasmid(s) and R plasmid(s) in *S. Wien* and *S. alachua*. *Indian J Med Res* 1980;142:485-91.
8. Lefevre LA, Guibout VL, Bredin J, Barguelli F, Amor A, Pages JM, *et al.* Imipenem resistance in Salmonella enterica serovar Wien related to Porin loss and CMY- 4  $\beta$  lactamase production. *Antimicrob Agents Chemother* 2003;47:1165-8.
9. Murphy BP, O'Mahong R, Buckley JF, Shine P, Boyd EF, Gilroy D, *et al.* Investigation of a Global collection of Non Typhoidal Salmonella of various serotypes cultured between 1953 and 2004 for the presence of Class 1 Integrins. *FEMS Microbiol Lett* 2006;266:170-6.
10. Murugkar HV, Rahman H, Kumar A, Bhattacharyya D. Isolation, Phagetyping, and Antibigram of Salmonella from man and animals in Northeastern India. *Indian J Med Res* 2005;122:237-42.

Source of Support: Nil, Conflict of Interest: None declared.