Dual *Salmonella typhi* infection

Sir,

Enteric fever is endemic in our country. There have been reports of mixed infections with both *Salmonella typhi* and *Salmonella paratyphi* A.[1-5] These are usually identified by the biochemical reactions or during the disc diffusion susceptibility testing.[2,4] We present this uncommon case of *S. typhi* infection where we isolated two strains – a sensitive and a multidrug resistant strain from a single blood culture.

Our patient, a 30-year-old male, presented with fever, vomiting, and abdominal pain of 10 days duration. The fever was high grade, intermittent not associated with chills and rigors. The abdominal pain was colicky in nature. There was no history of vomiting or diarrhea. There was no significant past history. On examination, he was febrile. There was no hepatosplenomegaly. Laboratory investigations revealed: Hemoglobin 14.4 gm/dl, total leukocyte count of 7660 mm^3, (polymorphs 70%, lymphocytes 20%, and monocytes 05%). Alkaline phosphatase was raised: 154 IU/ml, alanine amonotransfarase: 127 IU/ml, and aspartate aminotransferase: 26 IU/ml. The blood culture was done by the BacT/alert system (BioMerieux, India). The bottle flagged positive after 12 h. A Gram stain was done from the bottle that revealed gram-negative bacilli. The broth was subcultured on 5% sheep blood agar and MacConkey agar. Direct disc diffusion susceptibility testing and standard biochemical reactions were put up from the broth.

After overnight incubation, there were nonlytic colonies on the

blood agar and nonlactose fermenting colonies on the MacConkey agar. The biochemical tests were read as *S. typhi* with H_2S production in the triple sugar iron with no gas production. However, on the Mueller Hinton plate of the susceptibility testing, double zones were seen for the following antibiotics- ampicillin, chloramphenicol, and trimethoprim-sulfamethoxazole. The zones for ceftriaxone and ciprofloxacin were in the sensitive range and the nalidixic acid disc had no zone (resistant). Agglutination with different colonies from the blood agar plate was positive for *Salmonella poly O*, TO and TH antisera and negative for AH antisera. All the plates were reincubated and observed after 48 and 72 h incubation. There was only one type of colony seen in both the MacConkey and blood agar plates. Ten colonies were randomly selected and biochemical reactions and susceptibility testing was put up from each of the colonies for ampicillin, chloramphenicol, trimethoprim-sulfamethoxazole, ceftriaxone, ciprofloxacin, and nalidixic acid. Here we found that all the colonies had the reactions for *S. typhi* but there were two types of susceptibility test patterns: One which was susceptible to the antibiotics tested except nalidixic acid and the other which was resistant to ampicillin, chloramphenicol, trimethoprimsulfamethoxazole and nalidixic acid. Hence, we concluded that there was a dual *S. typhi* infection – with a sensitive strain as well as a multidrug resistant *S. typhi* strain.

The patient was treated with injectable ceftriaxone and oral azithromycin for 10 days and was afebrile after the fifth day of treatment. On follow up, he remained asymptomatic.

Mixed infections with Salmonella serotypes are not commonly encountered. The author has previously reported two cases of mixed infections with *S. typhi* and *S. paratyphi* A.[2,4] However, mixed infection with two strains of *S. typhi* in the same person has not been reported in the literature to the best of our knowledge and search. It would be prudent to be vigilant and look out for mixed infections of Salmonella serotypes in suspected cases of enteric fever.

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