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Salmonella Paratyphi Causing Endocarditis: A Rare Case Report

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Abstract

With the trends of emerging paratyphi infections, especially in South Asia, the increase in the incidence of its rarer manifestations is around the corner. Here, we describe the case of Paratyphoid Endocarditis in a 55-year-old man, presenting to the ER with fever, vomiting, and aortic murmur, the subsequent diagnostic workup, and the treatment plan. The rarity of the disease has led to a scarcity of knowledge about the appropriate course of treatment, particularly whether surgery is required. Furthermore, a broader community-level strategy, such as the development of vaccines including the paratyphi strains, and measures to disrupt the modalities of disease transmission are required to curb the morbidity and mortality of *Salmonella paratyphi*. [*Bangladesh Journal of Infectious Diseases, December 2024;11(2):214-216*]

Keywords: *Salmonella paratyphi* A, Endocarditis, Paratyphoid Endocarditis

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Introduction

Worldwide, there were 14.3 million cases of enteric fever in 2017, of which South Asia accounted for 71.8 percent[1]. Recent trends, especially in Asia have shown a shift in incidence from typhi to paratyphi. A study conducted in Southeast China concluded that Paratyphi A is isolated more often than Typhi. One of the suggested reasons for this trend appears to be the non-availability of licensed vaccines which confer protection against the paratyphi strain. Secondly, due to distinct transmission methods of the two, preventive measures for typhi alone, don't suffice[2].

In regards to the above, it can be extrapolated that the rise in paratyphi infections may lead to an uptick in its rarer manifestations, especially owing to its hematogenous spread and ability to get seeded at various sites in the body. Here we present a case of endocarditis caused by Salmonella Paratyphi A.

Case Presentation

A 55-year-old male patient, presented to the Emergency Department, with complaints of fever since 1-week, generalized weakness for 3 days, 2 episodes of vomiting in 2 days. The patient also complained of giddiness since morning. The fever

was without chills or rigors, the vomiting was bilious, non-blood stained, and nonprojectile. On further questioning, the patient did not have any abdominal pain/other gastrointestinal symptoms, burning micturition, headache, cough etc. The patient had no comorbidities like Diabetes, hypertension, Tuberculosis, or any preexisting cardiac conditions. On initial assessment, the pulse was 87bpm, Blood pressure was 132/80mm Hg, respiratory rate was 20cpm, and SpO2 was 99%. The patient was febrile with a fever of 101.8 degrees Fahrenheit, mild dehydration was also noted, and the systemic examination revealed an ejection systolic murmur at the aortic region. An ECG was taken, which showed T-wave inversion in V5 and 6, and blood work was also sent. A provisional diagnosis of Acute Febrile Illness was made and as per the patient's symptoms, he was given antipyretics, antiemetics, and IVF.

The patient was admitted for further evaluation of his condition. The lab results were as follows, CBC was within normal limits, with a Total Leukocyte count of 5940, however, a slightly raised Neutrophil percentage of 81.7% was noted. The ESR was 36 and CRP was 136, indicative of an underlying inflammatory condition. Testing for Dengue NS-1 Antigen, Malaria parasite, and microfilaria was conducted owing to the high prevalence of these conditions in South India, especially during monsoon season. The results came back negative. LFT showed mild elevation in AST (947) and ALT (954). RFT and Electrolytes were normal. Urine complete analysis came back normal with no signs of UTI. Blood cultures were sent on day 2, which yielded the growth of Salmonella Paratyphi A 15 hours after incubation.

Further evaluation by transthoracic echocardiography was planned given the murmur in the aortic region revealed Left Ventricular hypertrophy, thick calcified aortic valve, severe aortic stenosis, mild aortic regurgitation, mild tricuspid regurgitation, mild pulmonary artery hypertension, and LV systolic function of 60%. The cardiac findings were incidental and the patient did not have any h/o rheumatic or other cardiac conditions. The patient was scheduled for a transoesophageal Echocardiography which showed .7cm x .5cm vegetation. The diagnosis of Severe aortic stenosis and paratyphi endocarditis was established. The patient was empirically started on intravenous Ceftriaxone, oral Doxycycline, and intravenous. Amikacin. After receiving the culture sensitivity report, the patient was shifted to targeted antibiotic therapy as the microbe was sensitive to Cefixime. A repeat blood culture was performed on day 3 and yielded no growth after 48 hours. TLC were repeated on days 4 and 7 and they were normal. Fever spikes resolved in 1 week and the patient was discharged with T. Cefixime. No surgical management was done. The patient continued the further Aortic Stenosis management with a cardiologist who was his relative. The patient followed up in OPD and repeated Echo and blood culture showed no sign of infection on completion of antibiotic therapy.

Discussion

Endocarditis is one of the rarest complications of salmonella infection particularly in the case of Serovar Paratyphi A. There were only 3 reported cases of Paratyphi Endocarditis in English literature up to 2002.[3] Furthermore, a review of English literature by Cheng et al. noted only 1 case of paratyphi endocarditis between 2003 to 2014. Their study also described that there have been 87 reported cases of salmonella endocarditis between 1976 and 2014, with the predominance of patients being men and a mean age of 50-60 years. The mortality rate among these cases was 42.5%. Among these, the cases of Typhi/Paratyphi had lesser comorbidities and a younger mean age of the population, implicating greater invasiveness of these organisms compared to the non-typhoidal counterparts[4].

Due to the paucity of cases, there exists a deficit of knowledge, in terms of the clinical presentations, prognosis, and suitable treatment plans. Fever, heart failure, murmurs, and cerebral emboli are some of the most consistent findings of Non-typhoidal Salmonella Endocarditis with a mean duration of symptoms being 3 weeks[5]. Gastrointestinal symptoms preceding the episode of endocarditis were recalled in 27.0% to 42.0% patients, hence it doesn’t seem to be a very suitable diagnostic criterion[4]. About 45.0% of patients presented with leucocytosis more than 12000. Both Transthoracic Echocardiography and Transoesophageal Echocardiography are very reliable diagnostic tools and helped demonstrate the vegetation in 100.0% of the patients affected, consistent with the findings of this case report**.** The most commonly affected valve is the mitral valve[5].

Some of the salient features distinguishing this case include our patient additionally presented with 2 episodes of vomiting and giddiness without demonstrating any other focal neurological deficits. There were also no preexisting comorbidities and

aortic valve involvement instead of mitral. Day 1, 4, and 7 WBC counts were also within normal limits.

There are conflicting opinions on whether or not surgical intervention is required. Some data suggests that patients managed by surgery and antimicrobial therapy had a mortality rate of 15 percent offering a better prognosis than with antibiotics alone, with a mortality rate of 27.2 percent. However, it is important to consider that some of the patients who were managed solely with medical therapy might have been in such a critical condition that cardiac surgery was deemed unsafe[4]. Furthermore, a case report demonstrated successful medical management of Salmonella bioprosthetic valve endocarditis by long-term fluoroquinolones. In contrast, conventionally, salmonella prosthetic valve endocarditis would have been an indication for replacement surgery[6]. Additionally, our patient was successfully treated medically. Thus, there needs to be further investigation into the indications for surgical management of cases of Salmonella endocarditis.

Conclusion

In conclusion, *Salmonella paratyphi* may be a rare culprit of Infective endocarditis and should be considered when the more common organisms have been ruled out, especially in South Asia. TTE TEE and blood cultures may be required even in cases having a normal WBC count. Whether or not surgical management is required remains ambiguous and warrants further study.

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Conflict of Interest
The authors declare no competing interests.

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All of the listed authors have reviewed and approved the manuscript.

Data Availability
Any questions regarding the availability of the study's supporti ng data should be addressed to the corresponding author, who can provide it upon justifiable request.

Ethics Approval and Consent to Participate
Written and informed consent was taken from the patient.

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