

# ENDOCARDITIS AND PERICARDITIS CAUSED BY *SALMONELLA PARATYPHI* A: TWO CASE REPORTS AND REVIEW OF THE LITERATURE

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**Abstract.** We report on two children with paratyphoid fever and rare cardiac complications (endocarditis and pericarditis) during an outbreak of *Salmonella paratyphi* A infection in Bangkok, Thailand, in 1996. Both of the patients had underlying congenital heart disease. Two cases in the literatures of endocarditis and five cases of pericarditis caused by *Salmonella paratyphi* were reviewed. These rare cardiac complications should be considered among persons who reside in an endemic area of enteric fever or during disease outbreaks, especially in children with underlying heart diseases.

## INTRODUCTION

Enteric fever is a serious health problem in many regions of the world. The causative organisms are *Salmonella typhi*, giving rise to typhoid fever, and *Salmonella paratyphi* (*S. paratyphi*), resulting in paratyphoid fever. Paratyphoid fever is relatively uncommon in Thailand; however, in 1996, there was an outbreak of *S. paratyphi* A infection in Bangkok, and nine children were diagnosed and treated at Chulalongkorn Hospital (Pancharoen and Thisyakorn, 1998). Two of these children had co-existing rare cardiac complications: one had endocarditis and the other had pericarditis.

### Case report 1

An eight-year-old boy, with the Tetralogy of Fallot (TOF), presented with a ten-day history of fever, headache and vomiting. Physical examination revealed high fever, cyanosis, heart murmur and clubbing, without evidence of congestive heart failure. A complete blood count revealed a hematocrit of 71.7 volume percent,

a white blood cell count of 6,120 cells/mm<sup>3</sup> (69% neutrophils; 24% lymphocytes; 5% monocytes) and a platelet count of 171,000 cells/mm<sup>3</sup>. Echocardiogram findings were consistent with TOF and revealed a 0.7 x 0.7 cm vegetation on the interventricular septum. Blood cultures were positive for *S. paratyphi* A in three out of four specimens. Paratyphoid fever with endocarditis was diagnosed. The patient was treated with ampicillin, which was eventually changed to cefotaxime after the appearance of a rash indicating ampicillin allergy. Antibiotic treatment was stopped after four weeks of successful therapy.

### Case report 2

An eleven-year-old boy, with an atrial septal defect, a patent ductus arteriosus and tricuspid insufficiency, presented with a prolonged fever and a three-week history of vomiting; one week prior to admission, he had become dyspneic. Physical examination revealed heart murmurs, a pericardial rub and hepatomegaly without evidence of embolic phenomena. A mild leukocytosis without left shifting was found. A chest X-ray showed pulmonary congestion and enlargement of the cardiac shadow; an echocardiogram disclosed a pericardial effusion with no vegetation detected. Inotropic drugs, diuretics and erythromycin were given. Blood cultures revealed *S. paratyphi* A, sen-

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sitive to ampicillin and cotrimoxazole, in four out of five specimens. Paratyphoid fever with pericarditis was diagnosed. Intravenous ampicillin was used successfully.

Enteric fever was, in the past, a major public health problem in Thailand. A report of 192 hospitalized Thai children with typhoid and paratyphoid fever did not show the development of associated cardiac complications (Thisyakorn *et al*, 1987). To the best of our knowledge, our patients are the first cases of endocarditis and pericarditis caused by *S. paratyphi* in Thailand.

Nontyphoidal salmonella endocarditis is a distinctly rare clinical entity. From 1939 to 1967, only 23 confirmed cases have been recorded, most of which were caused by *Salmonella choleraesuis*; there were no cases of endocarditis caused by *S. paratyphi* (Schneider *et al*, 1967). Twenty cases of salmonella endocarditis among 7,779 cases of salmonella infections were reported and none of these was caused by *S. paratyphi* (Saphra and Winter, 1957). Previous literature reports and reviews (Johnson *et al*, 1975; Gupta *et al*, 1994) mention only two cases of endocarditis caused by *S. paratyphi*: both were caused by *S. paratyphi* A and in neither case was there a premorbid history of note, whereas our case (Patient 1) had underlying cardiac disease. One of the two previously reported cases was in a pediatric patient aged 11 months. Details of the three cases are summarized in Table 1.

Nontyphoidal salmonella pericarditis is also uncommon. A literature review of 23 cases of nontyphoidal salmonella pericarditis between 1936-1986 (Haggman *et al*, 1986) revealed four patients with pericarditis caused by *S. paratyphi* (Thiodet *et al*, 1960; Dorra *et al*, 1975; Kartleve *et al*, 1980), including two cases caused by *S. paratyphi* A. In 1990 there was a reported case of salmonella pericarditis caused by *S. paratyphi* A in a 23-year-old female with underlying systemic lupus erythematosus (SLE) (Guerrero and Segovia, 1990). The five previously reported cases were all in adults. Our case (Patient 2) might have had pericarditis not associated with his underlying congenital heart disease which could have been a merely incidental finding. Although the echocardiogram did not demonstrate any vegetation, the possibility of associated infective endocarditis could not be completely ruled out. The details of these patients and our patient are summarized in Table 2.

All isolates of *S. paratyphi* A, including these two isolates, tested during the outbreak were sensitive to all three first-line antibiotics, *ie* ampicillin, chloramphenicol and cotrimoxazole (Pancharoen and Thisyakorn, 1998). Therefore therapy presented no difficulties.

In summary, even though cardiac complications are rare in paratyphoid patients, they ought to be considered in patients with underlying heart disease in areas where enteric fever exists or during outbreaks of the infection.

Table 1  
Confirmed cases of endocarditis caused by *S. paratyphi*.

Year (Authors)	Age/Sex	Preexisting disease	Involved endocardium	Vegetation	Group of <i>S. paratyphi</i>	Outcome
1975 (Johnson)	11 mo/M	None	TV	Present	A	Death
1994 (Gupta)	31 yrs/F	None	AV	Present	A	Recovery
Patient 1	8 yrs/M	TOF	IVS	Present	A	Recovery

Note: mo = months, yrs = years, TV = tricuspid valve, AV = aortic valve, IVS = interventricular septum, TOF = Tetralogy of Fallot, F = female, M = male

Table 2  
Confirmed cases of pericarditis caused by *S. paratyphi*.

Year (Authors)	Age/Sex	Preexisting disease	Group of <i>S. paratyphi</i>	Outcome
1960 (Thiodet)	24 yrs/F	None	A	Recovery
1975 (Dorra)	40 yrs/M	None	A	Recovery
1980 (Kartieve)	83 yrs/M	Cardiac aneurysm	D	Death
	84 yrs/M	Cardiac aneurysm	B	Death
1990 (Guerrero)	23 yrs/F	SLE	A	Recovery
Patient 2	11 yrs/M	ASD,PDA,TI	A	Recovery

Note: yrs = years, F = female, M = male, SLE = systemic lupus erythematosus, ASD = atrial septal defect, PDA = patent ductus arteriosus, TI = tricuspid insufficiency

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