Salmonellosis beyond the gastrointestinal tract: a case series

DLB Piyasiri[1], P Chandrasiri[2], HS Jayasinghe[3], S Pathirage[4], PM Sapukotana[1], TSH Gamage[1]

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Introduction

Genus Salmonella is a member of the family enterobacteriaceae, and the disease salmonellosis is contracted through ingestion of contaminated food or water. It is associated with poor sanitation and lack of clean drinking water.

While Salmonella Typhi and Salmonella Paratyphi A, B, C are known to cause enteric fever, together with other Salmonella species (non typhoidal Salmonella) they can cause extra-intestinal disease or complications due to seeding of the bacterium in other organs following bacteraemia. The bacterium can affect anywhere in the body causing endocarditis, vascular infections, cholecystitis, hepatic and splenic abscesses, urinary tract infections including pyelonephritis, pneumonia, empyema, meningitis, septic arthritis and osteomyelitis. In this paper we describe extra-intestinal salmonellosis cases reported from different parts of Sri Lanka.

Case report 1

A 25 year old student presented with fever and headache of one week duration to National Hospital of Sri Lanka, Colombo, in October 2010. Blood culture became positive for Salmonella Paratyphi A and the patient was treated with IV ceftriaxone.

Although fever responded initially after few days it reappeared. Upon further investigations, mitral valve vegetation was detected. Ceftriaxone dose was increased to 2g mane and 1g in the evening (12 hours apart) and continued for 4 weeks followed by oral azithromycin 500mg daily for another week. Complete recovery was observed with the disappearance of vegetations.

Case report 2

A 7 month old boy presented with generalized tonic clonic convulsions with fever to District General Hospital Polonnaruwa in November 2013. About one month prior he had been treated for pyogenic meningitis for 2 weeks with IV ceftriaxone.

In the second admission too, his physical examination, white cell count (18.9x109/l), C reactive protein (>96mg/l) and cerebrospinal fluid report were suggestive of bacterial meningitis and the CT brain showed left sided focal cerebritis. Blood culture became positive for Salmonella Group B.

Due to poor response to ceftriaxone, antibiotics were changed to IV meropenem 40mg/kg 8 hourly and IV chloramphenicol 25mg/kg 6 hourly. The patient responded to these antibiotics. After 6 weeks he was discharged and was followed up regularly in the clinic. Family was screened for Salmonella carrier status and was found to be negative.

Case report 3

A one month and 8 days old baby presented with high fever and convulsions to Teaching Hospital Karapitiya in August 2017. He had been treated for meningitis for 3 weeks with IV meropenem prior to the second admission. CT revealed cerebritis. Blood culture grew Salmonella typhimurium. He was treated for 8 weeks with IV chloramphenicol and IV meropenem until complete clinical resolution was obtained. Household contacts were screened for Salmonella carrier status and was found to be negative.

Case report 4

A 48 years old male from Sooriyawewa was transferred to Teaching Hospital Karapitya in May 2016 with pyelonephritis and septic shock. He had pyelolithotomy in 2007 for left sided ureteric and pelvi-ureteric junction calculi with partial obstruction.

The total white cell count was 4.9x109/l and CRP was 122.5 mg/l with a serum creatinine 333 micmol/l. Ultrasound scan of the kidneys revealed bilateral renal calculi. Bilateral JJ stenting was done. Blood culture became positive for Salmonella typhimurium (group B). Patient was treated with a combination of IV meropenem and IV ciprofloxacin for 2 weeks and changed to oral azithromycin for one more week.

1Teaching Hospital Karapitiya, Galle, 2National Hospital of Sri Lanka, Colombo, 3District General Hospital Polonnaruwa, 4Medical Research Institute, Borella.

Correspondence: DLBP, e-mail: <bhagyapiyasiri@yahoo.co.uk>. *Received 09 September 2017 and revised version accepted 20 November 2017.*

Figure 1. CT angiogram of the abdomen showing stenosis of the left renal vein anterior to the aorta

Discussion

Endocarditis and vascular infections

Endocarditis, pericarditis, valve perforation, and arteritis caused by Salmonella have been reported worldwide usually with a poor prognosis. In 2016, Cheng et al. reviewed 500 cases between 1976 and 2014 which comprised 87 cases of typhoid and non-typhoid Salmonella endocarditis with male predominance and mitral valve involvement in majority of cases (33.3%). The overall mortality rate was 42.5% but it has decreased over time from 69% to 13% with the advancement of management [1].

Salmonella endcarditis is usually associated with a predisposing condition, such as rheumatic heart disease, diabetes, corticosteroid therapy, malignancy, HIV, drug abuse [2]. Several case reports suggest ceftriaxone as the drug of choice with or without gentamycin/azithromycin/fluoroquinolone and that treatment should be continued for 4-6 weeks depending on the response.

Surgical removal of the infected valve may be necessary but our patient recovered fully with antibiotics alone which might have been due to younger age, lack of any predisposing conditions, early diagnosis and prompt treatment.

Salmonella meningitis

Worldwide Salmonella meningitis remains a threat to children aged less than 2 years [3]. In a study done in Kuala Lumpur by Lee et al. on Salmonella meningitis in infants, 13 infants presented with fits and complications such as hydrocephalus, subdural effusions, empyema, ventriculitis, intracranial haemorrhage and cerebral abscess [4]. Overall mortality rate was 13%-18% [3, 4]. The study further describes that relapses occurred due to inadequate treatment as might have happened in our cases as well.

Salmonella urinary tract infections

Urinary tract infection by Salmonella is usually associated with immunosuppression, chronic disease such as diabetes, structural abnormalities or renal stones. Haematogenous spread from gastroenteritis and seeding around the stones causing secondary bacteraemia is possible in our patient with pyelonephritis. Also the infective dose of the organism might have been reduced by the chronic pain killers with antacids use.

In a study by Jose M et al. of 28 cases of bacteriuria due to non typhoidal Salmonella, 16 had cystitis, 3 had pyelonephritis while 2 had renal abscess [5]. Salmonella enteritidis was the most frequently isolated (n=16) followed by Salmonella typhimurium (n=5) as in our case.

Conclusion

Clinicians should understand the importance of taking blood for culture from patients with suspected salmonellosis before commencing antibiotics. Though the recommended drugs of choice are ceftriaxone or cefotaxime (in neonates), complications or poor response might require a different regime which is preferably a combination of sensitive antibiotics. Complicated extra-intestinal infections may need an extended duration of antibiotics to prevent a relapse. Also early detection of complications and prompt action will improve the survival rates and reduce residual damage.

Conflicts of interest

Authors declare that they have no conflicts of interest

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