Case Report

First reported case of neck abscess caused by non–typhoidal *Salmonella* in Sri Lanka

DD Jayasundara[1], MPGR Imalka[1], SM Thelikorala[2], N Udayani[2], LG Yapa[1]

Sri Lankan Journal of Infectious Diseases 2021 Vol.11(2):102-106

DOI: http://dx.doi.org/10.4038/sljid.v11i2.8357

Abstract

Non-typhoidal *Salmonella* species (NTS) are a well-known cause of food borne gastroenteritis. Invasive infections due to NTS are rare and usually reported in patients with underlying immunosuppressive conditions like HIV or diabetes mellitus. Transient bacteraemia which occurs in NTS infections could be followed by development of a localized focus in these patients. This case report is on a patient with poorly controlled diabetes mellitus who presented with fever and progressive neck swelling and was found to have abscess formation in the cervical lymph nodes. The isolate from the drained pus was identified as *Salmonella* species by a rapid identification system and confirmed as *Salmonella enterica* serovar Enteritidis at the National reference laboratory. Proper surgical drainage combined with appropriate antimicrobial therapy and good glycemic control helped to manage the patient successfully.

This case report emphasizes the necessity of establishing the aetiology accurately as empirical antibiotic therapy for neck abscess usually targets Gram positive bacteria and anaerobic flora of the mouth rather than a Gram negative bacterial aetiology. This is the first reported case of neck abscess due to NTS in Sri Lanka to the best of our knowledge.

Keywords: Non typhoidal Salmonella, Neck abscess, Diabetes mellitus

Introduction

The main clinical manifestation of infections caused by non-typhoidal *Salmonella* serotypes (NTS) like Enteritidis and Typhimurium is gastroenteritis associated with consumption of contaminated poultry.[1] Transient bacteraemia with NTS infections may occur in 4% of cases which usually gets cleared from circulation.[1] However focal infections, mainly as endovascular

[1] *Department of Microbiology, Teaching Hospital, Anuradhapura, Sri Lanka*
[2] *ENT Unit, Teaching Hospital, Anuradhapura, Sri Lanka*

Address for correspondence: Dr. Dinesha Jayasundara., Department of Microbiology, Faculty of Medicine and Allied Sciences, Rajarata University, Sri Lanka Telephone: +0094718426259 E-mail: jmddjaya@gmail.com

https://orcid.org/0000-0002-5573-0268

Received 12 March 2021 and revised version accepted 20 June 2021.

and pulmonary involvement following bacteraemia can occur with NTS in immunocompromised conditions like HIV infection and diabetes.[2,3] Published data on neck abscesses caused by invasive NTS are rare.[4] We report a case of neck abscess caused by *Salmonella enterica* serotype Enteritidis in a patient newly diagnosed with type 2 diabetes mellitus. This is the first reported case of neck abscess due to NTS in Sri Lanka to the best of our knowledge.

Case Report

A 43 year old male patient was admitted to the ENT Unit of Teaching Hospital, Anuradhapura in July 2020 with a two week history of fever and progressive painful swelling of the left side of his neck. He was newly diagnosed to have type 2 diabetes mellitus 6 months ago, and had defaulted on his treatment. He works as a barber in a saloon and frequently got his meals from food vendors with frequent consumption of eggs and beef. One month before the onset of the neck swelling, he had an episode of watery diarrhoea which was self-limiting and lasted three days. He denied close contacts with animals or a recent dental procedure. He is allergic to penicillin.

Ultrasound scan (USS) of neck done on the first day of admission revealed a confluent nodal mass at level 11 cervical lymph nodes measuring 4.2x2.8cm with abscess formation, necrotic changes and multiple enlarged reactive cervical lymph nodes at level 11 and 111 on the left side. USS guided aspiration of the abscess was done on the first day and pus was sent for bacterial culture, microscopy for AFB and mycobacterial culture. The patient was started on intravenous clindamycin 600mg six hourly. Repeat USS of the neck three days later showed the collection to be of the same size with compression of the internal jugular vein without compromising the patency of blood flow. Repeat drainage of the abscess was done under general anaesthesia four days after admission and a drain was inserted.

Direct Gram stain of the pus sample showed a 3+ pus cell count (> 25 pus cells/per low power field) and Gram negative bacilli. Pus culture yielded a pure growth of a non-lactose fermenting, oxidase negative, H_2S producing, motile, Gram negative bacillus. A rapid identification kit (Remel RapID^{TM} ONE system) identified the isolate as *Salmonella* species which was sent to the reference laboratory for confirmation and serotyping. Antibiotic susceptibility testing (ABST) was performed according to CLSI method.[5] The isolate was sensitive to ampicillin, cefotaxime, and ciprofloxacin. The patient was started on intravenous ciprofloxacin 500 mg 12 hourly dose on day four of admission. The isolate was confirmed as *Salmonella enterica* serovar Enteritidis at the reference laboratory and had the same ABST pattern. The sample was negative for mycobacterial studies.

On admission, the patient had fever spikes of 103 ^{o}F, neutrophil leukocytosis with a WBC count of $19x10^3$/µl and CRP of 337mg/L (normal <5mg/L). His fasting blood sugar (FBS) was 246mg/dL. He was started on soluble insulin which was later converted to oral anti-diabetic drugs. The mass was 2.5x1.0cm on the follow up scan on day seven of ciprofloxacin therapy and repeat pus culture sent from the drain was negative. By day seven, the WBC had dropped to $10x10^3$/µl and CRP to 42.3mg/L and the patient was afebrile. His HIV screening was negative.

Intravenous ciprofloxacin was changed to oral ciprofloxacin after a single dose as the patient developed a local intravenous site reaction and refused further IV administration. The patient was discharged on oral ciprofloxacin 500mg 12 hourly to complete a three week treatment course. He was reviewed in the ENT clinic upon completion of treatment at which time the abscess had completely resolved clinically. Subsequently he was followed up in the ENT clinic for recurrences and referred to a medical clinic for follow up of diabetes mellitus. The timeline of the illness is shown in Figure 1.

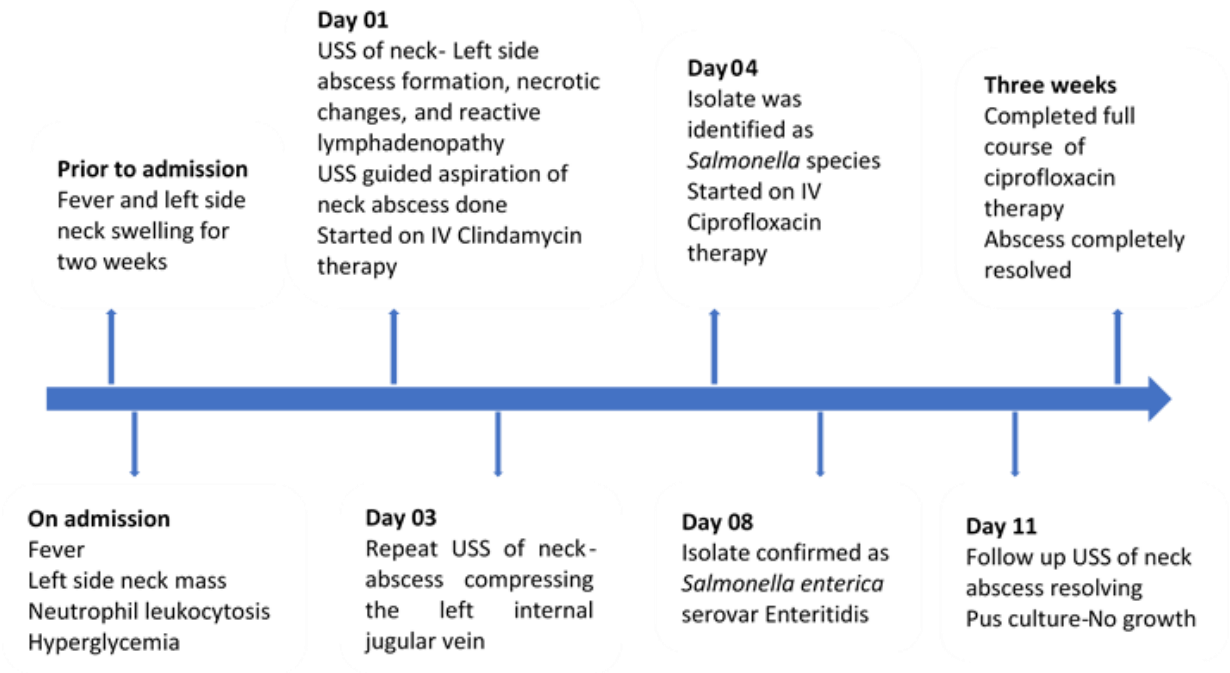

Figure 1: Timeline of the illness

Discussion

The pathogenesis of soft tissue infections with NTS is due to haematogenous spread following invasion from the gastrointestinal tract with subsequent localization.[1] An underlying acquired immunosuppressive condition or inherited deficiency in interleukin 12 pathway have been reported to be key predisposing factors in invasive NTS infections.[2,3,6] History of an acute diarrhoeal episode preceding the condition, regular consumption of poultry products and poorly controlled diabetes mellitus might have contributed to this illness in our patient. Eggs have been found to be the main food source in transmission of the serovar Enteritidis.[7,8,9] However scarcity of reported extra-intestinal infections and lack of awareness among clinicians might lead to gross under-estimation of such cases if proper microbiological investigations are not attempted.

Beta lactam antibiotics are considered as first line of treatment for neck abscess as *Staphylococci*, *Streptococci* and anaerobic flora of mouth are most frequently implicated.[10] Third generation cephalosporin containing regimens are usually prescribed in Gram negative soft tissue

infections.[10] However, in this patient beta lactams were not prescribed due to the history of penicillin allergy.

Thrombosis of the internal jugular vein is an anticipated complication, given the location of the abscess.[11] Serial USS of neck helped to exclude such complication, emphasizing the necessity of follow up imaging studies.

Conclusion

Establishing the etiological agent by carrying out relevant microbiological investigations seems to be crucial in soft tissue infections of immunocompromised patients as rare and previously unreported causes are always possible. Management should be guided by antibiotic sensitivity test results supported with adequate surgical drainage and control of predisposing factors. This case report also emphasizes the necessity of sending clinical samples to a reference centre to establish the etiological agent if adequate facilities are not available in the institute.

Declarations

Acknowledgement: We would like to acknowledge Dr. Sujatha Pathirage (consultant microbiologist) and other technical staff at enteric reference laboratory of MRI for carrying out serotyping and ABST.
Conflicts of Interest: Authors declare no conflicts of interest
Author contributions:
J.M.D.D. Jayasundara : initial laboratory work, drafted the initial version.
M.P.G.R. Imalka carried out initial laboratory work
S.M. Thelikorala and L.A.D.N. Udayani were involved in patient management and made amendments to the initial version.
A.G.D.T.L.G. Yapa supervised the laboratory work, was involved in the patient management and edited the final version of the article

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