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Non typhoidal salmonella septicemia

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Abstract
The bacterial genus *Salmonella* has emerged as a prominent cause of bloodstream infection, which can cause a huge global burden of morbidity and mortality. We report a case of a 68 year old male patient with recently detected DM presented as acute abdomen with greenish stools. His blood cultures grew Non typhoidal Salmonella species. On the basis of culture sensitivity report, the patient was treated with intravenous Ceftriaxone 2g daily and oral Azithromycin, following which the patient responded clinically.

Keywords: Salmonella, ketosis, bacteremia, non - typhoidal, acute abdomen

Introduction

Nontyphoidal *Salmonella* is one of the most common foodborne pathogens that cause gastroenteritis and bacteremia. The incidence of non-typhoidal salmonella bacteraemia is only 5–10% 9 [1]. S*almonella* species can live for unknown time period within the macrophages, resulting in a continuous carrier state [2]. The most common risk factors for developing salmonella infection include antacid / PPI use, diabetes, human immunodeficiency virus (HIV) infection, prior use of antimicrobial agents, and other immunosuppressive drugs [3]. Prevention of salmonella infections require control measures at all stages of the food chain, from agricultural production, to processing, manufacturing and preparation of food in commercial establishments as well as at home. A worldwide increase of antimicrobial resistance in non-typhoid *Salmonella* has recently been documented. Infectious Disease Society of America guidelines for the management of invasive non-typhoidal salmonella disease recommend 2–6 weeks of fluoroquinolone therapy. Azithromycin is an attractive alternative antimicrobial drug [4].

Case Report

68 year old male patient came with complaints of

1. Abdominal pain for 15 days, mild colic to severe colic present throughout the abdomen. Not associated with vomiting and fever.
2. 3 episodes of loose stools for 1 day, greenish semisolid stool, pea soup colour. No h/o blood in stool.

Medical history - Recently detected DM, not on OHA.
No history of cough, palpitations, burning micturition, joint pain, headache, vomiting.
Medication history -recent h/o intake of PPI, NSAIDS, Amoxicillin for dental infection.
Occupational history - working as a small scale businessman.

General Examination has shown average built. PR- 76/min, BP- 130/80 mm hg, RR- 20/min, SpO2- 98%, Temp- 36^0 C
RS – Normal
CVS- S1 S2 heard normally
P/A - No mass felt, tenderness more on Right iliac fossa.
CNS – No abnormality detected
His investigations showed TLC -12870 cells/mm3, Poly -85%, Lymph -10%, CRP- 102.1 mg/L, HbA1c - 9.4 %, Blood ß - Ketone - 1.9 mmol /L(0.0- 0.6 mmol/L), Acetone / Ketone Body, Spot Urine - 2+ :39 mg/dl(3.9 mmol/l).
Random Plasma Glucose - 332 mg/dL
Serum Creatinine - 0.83 mg/dL
Urea - 15.3 mg/dL
Sodium - 133 mmol /L
Potassium - 3.77 mmol /L
LDL Cholesterol - 103 mg/dL
TSH - 2.59 µIU/mL
Lipase, Serum- 12.0 U/L

LFT
Bilirubin, Total, Serum - 1.00 mg/dL
Bilirubin, Direct, Serum- 0.25 mg/dL
Bilirubin, Indirect, Serum - 0.75 mg/dL
Protein, Total, Serum - 6.91 g/dL
Albumin, Serum- 3.87 g/dL
Globulin, Serum - 3.0 g/dL
A: G Ratio- 1.27
AST (SGOT), Serum- 22 U/L
ALT (SGPT), Serum- 25 U/L
Alkaline Phosphatase, Serum - 80 U/L
Plain Xray abdomen in erect position – Normal
Urine C & S - No Microorganisms found.
Blood C & S - Salmonella species.
Stool, C & S - Culture negative for Salmonella spp, Shigella spp and Vibrio spp.

Occult Blood, Stool- Negative
USG Abdomen & Pelvis - No significant abnormality detected in the present study.
COVID 19 Antigen test - Negative
The patient was finally diagnosed as Infective diarrhea (Salmonella Enteritis) in septicaemia with T2 DM in ketosis.

Literature Review

1. Association between Recent Use of Proton Pump Inhibitors and Non Typhoid Salmonellosis: A Nested Case-Control Study - This case-control study provides evidence that PPI use is associated with an increased risk of NTS. The risk of acquisition of NTS was highest among current users and waned with time after use of PPIs. Proton pump inhibitors reduce acid secretion by selective inhibition of gastric hydrogen-potassium adenosine triphosphatase. The association between NTS and H2-receptor antagonists found in this study supports the notion that acid suppression is associated with increased risk of gastrointestinal infections. [5, 6].
2. Acute Abdomen In Diabetic Patients – Analysis Of Complications And Mortality:
   The study aimed to analyze the complications and mortality of acute abdomen cases in diabetic patients compared to non-diabetic patients. This was an observational, retrospective, cohort study conducted between 2008 - 2011, on a total of 4021 cases with acute abdomen. The mortality was significantly higher in diabetic patients than in nondiabetics (9.84% vs. 5.38%) [7].
3. Incidence of Campylobacter and Salmonella Infections Following First
   Prescription for PPI: A Cohort Study Using Routine Data - this study examined the incidence of Campylobacter and Salmonella infection in patients prescribed proton pump inhibitors (PPIs) compared with controls.
   The PPI group had an increased hazard rate of infection (after prescription for PPI) of 1.46 for Campylobacter and 1.2 for Salmonella, compared with baseline [8].
4. Appendicitis in non-typhoidal salmonella bacteraemia - Invasive systemic disease such as bacteraemia is a known clinical manifestation in typhoidal salmonella infections but uncommon in non-typhoidal salmonella infections which typically manifests as self-limiting gastroenteritis. Appendicitis is a rare form of presentation of acute abdomen in Salmonella infections.
   [9, 10]. Van Noyen *et al.* showed that only an estimated 8% of culture-proven bacterial enteritis had histologically proven appendicitis due to Salmonella [11, 12].

Discussion and Conclusion

This patient was a case of recently detected DM. Diabetes may be a risk factor for salmonella infection due to decreased gastric acidity and prolonged gastric transit time.
Acute abdomen is a frequent DKA manifestation. Usually it is attributed to severe metabolic acidosis but it can also be due to underlying abdominal pathologies such as pancreatitis and appendicitis. In this patient, USG abdomen was done to rule out such pathologies.
This patient had a history of excessive intake of PPI, antibiotics and NSAIDs for dental infection. Acid suppression induced by PPIs affects gastrointestinal motility and can indirectly alter gut microbiota. NSAIDs and antibiotics are known to disrupt intestinal homeostasis by suppressing macroautophagy in intestinal epithelial cells. Healthcare providers should consider the increased risk of Non typhoidal salmonella infection even within 30 days after the PPI and NSAIDS being discontinued.
Campbell *et al* in his study patients with acute abdominal pain associated with diabetic ketoacidosis improved with correction of metabolic abnormal parameters. It is therefore an important entity to avoid unnecessary and harmful exploration laparotomy [13].

References

1. Ryu C-B, Lee M-L, Namgoong EK, Kee SY, Lee WG, Woo JH. Bacteremia with non typhi salmonella and therapeutic implication. Korean J Intern Med. 1995; 10:146-149.
2. Gal-Mor O, Boyle EC, Grassl GA. Same species, different diseases: how and why typhoidal and non-typhoidal Salmonella enterica serovars differ. Front Micro, 2014; 5:391
3. Chen PL, Chang CM, Wu CJ, *et al*. Extraintestinal focal infections in adults with nontyphoid Salmonella bacteraemia: predisposing factors and clinical outcome. J Intern Med. 2007; 261:91-100.
4. Kaplan JE, Benson C, Holmes KH, Brooks JT, Pau A, Masur H, *et al*. Centers for Disease Control and Prevention (CDC) National Institutes of Health. HIV Medicine Association of the Infectious Diseases Society of America Guidelines for prevention and treatment of opportunistic infections in HIV-infected adults and adolescents: recommendations from CDC, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America. MMWR Recomm Rep. 2009; 58:1-207.
5. Hau-Hsin Wu, *et al*. Association between Recent Use of Proton Pump Inhibitors and Non Typhoid Salmonellosis: A Nested Case-Control Study. 2014; 59(11):1554-1558.
6. Reimer C. Safety of long-term PPI therapy. Best Pract Res Clin Gastroenterol. 2013; 27:443-54.
7. Dănuț Dejeu, *et al*. Acute Abdomen in Diabetic Patients – Analysis of Complications and Mortality. Rom J Diabetes Nutr Metab Dis. 21(4):277-284.
8. Sinead Brophy, *et al*. Incidence of Campylobacter and Salmonella Infections Following First Prescription for PPI: A Cohort Study Using Routine Data. Am J Gastroenterol advance online publication, 2013. doi: 10.1038/ajg.2013.30.
9. Siow Yun Wong *et al*. Appendicitis in non-typhoidal salmonella bacteraemia. Oxf Med Case Reports, 2018, (11):082.
10. Gal-Mor O, Boyle EC, Grassl GA. Same species, different diseases: how and why typhoidal and non-typhoidal Salmonella enterica serovars differ. Front Microbiol, 2014,

5:391.
11. Stewart-Parker EP, Atta M, Doddi S. Case report: a curious cause of appendicitis. BMJ Case Rep, 2016. pii: bcr2016216150. 10.1136/bcr-2016-216150.
12. Van Noyen R, Selderslaghs R, Bekaert J, Wauters G, Vandepitte J. Causative role of Yersinia and other enteric pathogens in the appendicular syndrome. Eur J Clin Microbiol Infect Dis. 1991; 10:735-41.
13. Campbell IW, Duncan LJ, Innes JA, MacCuish AC, Munro JF. Abdominal pain in diabetic metabolic decompensation. Clinical significance. JAMA. 1975; 233(2):166-168.