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Correspondence

Shubham Shrestha
Dept. of Internal Medicine,
Patan Hospital, Patan Academy
of Health Sciences, Lalitpur,
Nepal
Email:
shresthashubham3@gmail.com

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Spontaneous bacterial peritonitis due to streptococcus pneumoniae: a case report

Bipin Poudel¹, Shubham Shrestha²  , Bimal Pandey³ , Pawan Acharya⁴,
Rabindra Raj Pandey⁵

¹Intern Doctor, ²MBBS Student, ³Asst. Prof. Dept. of Internal Medicine, ⁵Resident, Dept. of General Practice & Emergency Medicine, Patan Hospital, Patan Academy of Health Sciences, Lalitpur, Nepal; ⁴Medical Officer, Dept. of Plastic Surgery, Lister Hospital, Stevenage, United Kingdom

Abstract

Despite not being a normal gastrointestinal flora, Streptococcus pneumoniae can be the causative agent of Spontaneous Bacterial Peritonitis (SBP) in clinical setting. Patient present with fever, progressive abdominal pain, swelling of limbs, abdomen or both. It is mainly diagnosed by ascitic fluid tapping and its cell count along with culture and sensitivity. This condition has very good response with antibiotics as per culture reports. Here, we present a common case of SBP caused by an uncommon pathogen Streptococcus pneumoniae.

Keywords: spontaneous bacterial peritonitis, streptococcus pneumoniae

Introduction

Spontaneous bacterial peritonitis (SBP) is defined as a positive bacterial finding in ascites, together with increased polymorphonuclear leukocytes in ascites (>250 cells/mm³).¹ Diagnosis of SBP is based on the analysis of ascitic fluid. Paracentesis is a safe and simple method for diagnosis SBP. In the ascitic fluid obtained from paracentesis, microorganisms responsible for SBP are isolated in 60%-70% of cases.² Most of the microorganisms responsible for SBP derive from the intestinal flora and are mainly aerobic gram-negative bacteria. *Escherichia coli* (*E. coli*) and *Klebsiellae* are the most common and second most common agents found respectively in 65% of positive culture results.³ *Streptococcus pneumoniae* is not known as gastrointestinal normal flora and is considered a rare cause of SBP. However, SBP caused by *S. Pneumoniae* is not uncommon in clinical setting, accounting 5.8% of all primary bacterial peritonitis in one study.⁴ Here we present a rare case of proven spontaneous bacterial peritonitis due to *Streptococcus pneumoniae*.

Case Report

On 14 Jan 2023, 20-year-old male presented with complaints of acute and intermittent fever and dull aching constant lower abdominal pain for a week along with bilateral lower leg swelling increasing in severity for a week with no other significant systemic history. On examination, he looked pale but well oriented to time, place and person. He was tachycardic and tachypneic with increased body temperature. Abdominal examination revealed soft, distended and tender abdomen with positive fluid thrill and no organomegaly was appreciated. Bilateral lower leg pitting edema was of grade I.

Investigations showed increased in total leucocyte count (17,900 cell/mm³, N-92%, L-8%), hyponatremia (Na/K- 128/3.6) and albuminuria of 3+. Ascitic fluid tapping showed increased WBC (18,800cells/mm³)

with increased in polyp (94% i.e.: ANC: 17,672 cells/mm³), protein 1 gm., LDH 1222. Abdominal ultrasonography showed moderate ascites, enlarged bilateral kidney and bilateral mild pleural effusion. An impression of SBP was made and patient was started on Inj. Cefotaxime 2 gm. IV. CECT (A+P) of 16 Jan 2023, showed ascites, Rt. Pleural effusion along with Rt. Renal vein thrombosis extending to sub-hepatic IVC. His treatment was added with Inj. Enoxaparin 40 mg SC and Tab Warfarin 2 mg. On 19 Feb 2023, culture report of ascitic fluid tapping showed growth of *Streptococcus pneumoniae* after which the patient was started on Injection Ceftriaxone 1 g IV in accordance with culture and sensitivity report.

On 28 Jan 2023, he developed shortness of breath for which high flow oxygen was started. Chest X-ray showed complete white out left lung. Serial pleural tapping of around 3 Liters of transudative fluid was done. 3 doses of methyl prednisolone pulse given later changed to oral prednisolone for 5 days resolved his symptoms and he was discharged on 7 Feb 2023.

Preceding to this, patient was in his usual state of health 4 months back when he experienced decreased urine output and lower abdominal pain for 11 days for which he visited another tertiary care hospital where he was diagnosed as a case of Primary Membranous Nephropathy (Anti- PLA2R stain positive) with evidence of segmental tuft sclerosis in 2/12(16.7%) glomerulus based on Kidney needle biopsy. He was prescribed with Inj. Methylprednisolone 1 gm, Cyclophosphamide 100 mg, Tab. Cortisol 30 mg, Tab. Losartan 50 mg and Tab Co-trimoxazole and was discharged after a week of inpatient treatment. Over the course of time, his abdominal pain subsided but urinary symptoms were not to his usual state.

Discussion

Here we presented a case of spontaneous bacterial peritonitis due to *Streptococcus*

pneumoniae in a biopsy proven membranoproliferative glomerulonephritis patient. Most of the microorganisms responsible for SBP derive from the intestinal flora and are mainly aerobic gram-negative bacteria. *Escherichia coli* (*E. coli*) and *Klebsiellae* are the most common and second most common agents found respectively in 65% of positive culture results.³ *Streptococcus pneumoniae* is not commonly found in the gastrointestinal tract because it is susceptible to the bactericidal effects of bile salts and gastric acid.⁶ In contrast, our case was a culture proven SBP due to *Streptococcus pneumoniae*.

A prospective study conducted in Nepal showed the culture positive of *E. coli* in 42.8% followed by *Streptococcus pneumoniae* in 28.57% which is in concordant with our case finding of *Streptococcus pneumoniae* in ascitic fluid culture which is also of the same country Nepal.⁷ A Spanish group previously reported that the most common cause of SBP was hematogenous spread from the respiratory tract.⁶ By contrast, our patient herein didn't have concomitant pneumonia but his pleural effusion manifested two weeks after might be the responsible pathology.

Case reports showed *Streptococcus pneumoniae* is the most common bacterium causing SBP in pediatric patients with nephrotic syndrome.^{8,9} Accordingly, here in our case the patient was a biopsy proven case of nephrotic syndrome who had developed SBP with *Streptococcus pneumoniae*. The administration of immunosuppressive agents for the treatment of nephrotic syndrome is also suggested as a major factor in the development of peritonitis.¹⁰

Although being not known gastrointestinal normal flora, *Streptococcus pneumoniae* is the major causative agent of SBP in nephrotic syndrome as shown in our case.

Conclusion

SBP with *Streptococcus pneumoniae* is a rare entity. The diagnosis is made with ascitic fluid

tapping and culture. This condition has very good response with antibiotics as per culture reports. Hematogenous spread from the respiratory tract can be the cause for it.

Acknowledgement

None

Conflict of Interest

None

Author Contribution

Concept, design, planning: BP, SS, BP, PA, RRP; Literature review: BP, SS, BP, PA, RRP; Data collection/analysis: BP, SS, BP, PA RRP; Draft manuscript: BP, SS, BP, PA RRP; Revision of draft: BP, SS, BP, PA RRP; Final manuscript: BP, SS, BP, PA RRP; Accountability of the work: BP, SS, BP, PA RRP.

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