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Primary bacterial peritonitis in a previously healthy adolescent female: A case report



Evangelos Blevrakis^a, Dimitrios Anyfantakis (MD, MSc, PhD)^{b,*}, Emmanouil Blevrakis^c, Ioannis Vlachakis^a

^a Pediatric Surgery Department, University General Hospital of Heraklion, Crete, Greece

^b Primary Health Care Centre of Kissamos, Chania, Crete, Greece

^c University General Hospital of Heraklion, Crete, Greece

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ABSTRACT

INTRODUCTION: Acute pneumococcal peritonitis represents an unusual entity characterized by infection in the abdominal cavity despite the absence of an obvious causative source. Patients with portal hypertension such as cirrhotics and those with nephrotic syndrome are more frequently encountered in the every day practice.

PRESENTATION OF CASE: A 14 years old female was referred to our department by his general practitioner with a 24 h history of right lower abdominal pain and fever. Clinical examination was suggestive for peritonitis and the girl was transferred to the operation room. A diagnosis of primary pneumococcal peritonitis was made on the basis of the findings during surgery and the microbiological tests. Institution of appropriate antibiotics resulted to complete recovery.

DISCUSSION: A mini literature review was performed.

CONCLUSION: Primary bacterial peritonitis in adolescents is extremely rare. Surgeons are required to be aware of this entity.

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1. Introduction

Acute pneumococcal peritonitis is an uncommon disease defined as the infection in the abdominal cavity despite the absence of an obvious source of infection [1,2]. It occurs almost exclusively in patients with portal hypertension, usually as a result of liver cirrhosis [1] as well as in those with nephrotic syndrome and HIV infection [1,2]. *Streptococcus pneumoniae* represents a common pathogen associated with high morbidity and mortality burden worldwide [3]. It is the most common cause of community-acquired pneumonia and the second most common cause of purulent meningitis [3]. Spontaneous bacterial peritonitis was first described in medical literature was in 1885 by Da Bozzolo in 1885 [4,5]. However our knowledge of pneumococcal peritonitis has continued to evolve.

We report a case of peritonitis caused by *Streptococcus pneumoniae* as the only causative organism. In those patients, when no apparent purulent foci in the genitourinary tract is found, such cases are usually called primary peritonitis. The case assumes significance because it occurs in the absence of any predisposing factor

for invasive pneumococcal infection, it is unimicrobial leading to misdiagnosis.

2. Case report

A 14 year old girl was admitted with a history of right lower abdominal pain of gradual onset and fever 24h prior to admission. The pain was associated with dysuria. Two weeks before she was diagnosed with a mild upper respiratory infection. On examination the child looked ill and moderately dehydrated and had temperature of 39, 7°C, blood pressure of 135/85 and tachycardia of 145/min. The respiratory system was found to be normal. The abdomen was slightly distended with marked tenderness, guarding and rebound tenderness across its lower part. Bowel sounds were absent. There was marked tenderness on rectal examination. The rest of the physical examination yielded normal findings. A clinical diagnosis of pelvic peritonitis due to appendicitis was made and laparotomy decided upon. A series of laboratory testing assays were performed, which evidenced a peripheral WBC count of 18,800/mm³ with 91% polymorphs, C-reactive protein elevated at 11,2 mg/dL (normal values, 0,08–0,8 mg/dL), erythrocyte sedimentation rate 96 mm/h. Results of urinalysis were as follow: specific gravity 1005, pH 5, no albumin or sugar, 4–5 pus cells per high power field, no erythrocytes or bacteria. Urine culture grew

* Corresponding author.

E-mail addresses: danyfantakis@med.uoc.gr, danyfantakis@yahoo.gr (D. Anyfantakis).

fewer than 100,000 *E. coli* per ml of urine. Throat culture grew normal flora. Blood culture was sterile. Plain X-ray of the abdomen revealed hydroaeric levels and chest X-ray performed did not show focal lesions in lungs. The performed abdominal ultrasound showed the presence of large amounts of free fluid in the peritoneum. A clinical diagnosis of pelvic peritonitis due to appendicitis was made and laparotomy decided upon. Antimicrobial empirical therapy was administered (ceftazidime and metronidazole) and an exploratory laparotomy was performed on the day of admission. The abdomen was opened, revealing acutely inflamed intestine and large collection of thick yellow pus in the pelvis. Furthermore the peritoneal surface of the intestines was red and inflamed and there were also some inflamed and enlarged mesenteric glands in the region of the caecum. The appendix which was not inflamed was removed and was sent for histological examination, which did not identify any kind of inflammatory process alterations. Culture of the vaginal swab obtained at the conclusion of laparotomy produced a moderate growth of diphtheroids and few *E. coli*. The culture from the abdominal fluid produced bacterium: *Streptococcus pneumoniae* (serotype 3) sensitive to penicillin, erythromycin, co-trimoxazole, ciprofloxacin and ceftriaxone. The antimicrobial regimen was changed to ceftriaxone which was administered for 10 days. The patient was discharged home in a good general condition after 11 days of hospitalization.

3. Discussion

Here we presented a case of spontaneous bacterial peritonitis due to *Streptococcus pneumoniae* in a healthy girl. *S. pneumoniae* and primary peritonitis represent unusual causes of bacterial peritonitis in healthy children [6,7]. In healthy children, *Streptococcus pneumoniae* is the most common cause of primary peritonitis, although *Staphylococcus aureus*, and Gram-negative organisms, such as *Escherichia coli*, have been observed [8].

Most cases of *S. pneumoniae* peritonitis reported in literature in apparently healthy female patients have been seen associated with local predisposing conditions [6,7] and genital colonization [9]. Primary peritonitis occurs more commonly in adult females of reproductive age. [8]. Our patient presented none of the mentioned risk factors for pneumococcal genital infections. Also HIV infection or immunoglobulin deficit, both of which are known to lead to more frequent and invasive pneumococcal infection, were not demonstrated.

In our patient, *S. pneumoniae* was not found in culture of pharyngeal swab, in blood or in urine samples. Further more there was no risk factor for invasive pneumococcal disease like splenectomy, steroid use, diabetes mellitus, intracranial dry eye, connective tissue disorder or alcoholism. There was also no history of past pneumococcal infection in this child in the form of otitis media, sinusitis or other respiratory tract infections.

Spontaneous bacterial peritonitis pathogenesis has not been fully elucidated, but it is assumed that the infection is caused by bacteria penetrating from the gastrointestinal tract lumen into the mesenteric lymph nodes, and from there into the portal circulation. The translocation is facilitated by oedema and increased permeability of intestinal mucosa, as well as excess proliferation of bacteria colonizing the intestinal lumen, caused by disrupted gastrointestinal tract motility. In addition, there also occurs impairment of the phagocytic activity of the reticuloendothelial system and the antibacterial one of the ascitic fluid [10]. Other sources of infection may be inflammatory foci within the respiratory and urinary system [10].

Spontaneous bacterial peritonitis is also known to be a severe complication of nephrotic syndrome, and yet one that despite being

characteristic in children, tends to be rare in adults [10]. *S. pneumoniae* is the most common agent of spontaneous bacterial peritonitis in patients with nephrotic syndrome [10].

To the best of our knowledge our literature search disclosed a few case reports of primary pneumococcal peritonitis in healthy individuals the absence of any other predisposing risk factors [2,11,12].

4. Conclusion

Surgeons as well as primary care physicians have to be aware about the eventuality to occur this entity in healthy children.

Informed consent

Written informed consent was given from the next of kin of the patient for the publication of this case report.

Ethical approval

No ethical approval was required.

Conflict of interest

None.

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None.

Author contribution

EB and IV operated the patient. EB and DA prepared the first draft of the manuscript. EB, and IV revised the manuscript for important intellectual content and technical details. IV provided useful suggestions on content and editing issues. All authors have read and approved the final manuscript.

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