STREPTOCOCCUS PNEUMONIAE CAUSING INTRAABDOMINAL AND PELVIC INFECTION: A CASE SERIES


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Introduction

Streptococcus pneumoniae is a pathogen known to cause pneumonia, sinusitis, meningitis and otitis media [1]. Pneumococcal infection can also be associated with non-specific abdominal symptoms, such as nausea, vomiting and diarrhea [2]. It is, however, an under-recognized cause of primary intraabdominal and pelvic infections. It has been reported to cause primary peritonitis, salpingitis, enteritis and appendicitis in adults and children [2-4]. We present here four cases of intraabdominal and pelvic infections associated with S. pneumoniae bacteraemia.

Case Summary

<table>
<thead>
<tr>
<th>Case</th>
<th>Age (years)</th>
<th>Presenting symptoms</th>
<th>Background history</th>
<th>Direct treatment</th>
<th>Microbiology of pneumococcus</th>
<th>Stool investigations</th>
<th>Conclusions</th>
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<tbody>
<tr>
<td>1</td>
<td>37 F</td>
<td>Vomiting, diarrhoea, fever, abdominal pain, myalgia</td>
<td>SLE*, pericarditis, pleuritis, depression, LLETZ procedure for CIN^</td>
<td>Exploratory laparotomy.</td>
<td>Pelvic pus PCR, Urine Ag^b, Ascites Ag</td>
<td>Predominant gram-positive diplococci on stool microscopy.</td>
<td>This case series highlights that S. pneumoniae is a rare but important cause of intraabdominal infection. The disease is more common in females. Risk factors include an indwelling IUD, long term steroid use or immunocompromise. Empiric therapy for pneumococcal disease may include penicillin, amoxicillin, moxifloxacin or a third generation cephalosporin. In patients presenting with clinical syndromes suggesting colitis, particularly if severe or affecting a high-risk group, ciprofloxacin or another fluoroquinolone should be prescribed empirically. These empiric treatment regimens do not provide adequate coverage for S. pneumoniae, which is a rare pathogen in these setting. Nonetheless, it is important to consider this organism in the differential diagnosis particularly for patients with risk factors for invasive pneumococcal infection or with a concomitant respiratory infection at presentation.</td>
</tr>
<tr>
<td>2</td>
<td>40 F</td>
<td>Vomiting, diarrhoea, fever, abdominal pain, myalgia</td>
<td>Spleenectomy for ITP^ 10 years prior, Penicillin allergy</td>
<td>Benzyl penicillin, Metronidazole</td>
<td>Pelvic pus PCR, Urine Ag^b, Ascites Ag</td>
<td>Predominant gram-positive diplococci on stool microscopy.</td>
<td>This case series highlights that S. pneumoniae is a rare but important cause of intraabdominal infection. The disease is more common in females. Risk factors include an indwelling IUD, long term steroid use or immunocompromise. Empiric therapy for pneumococcal disease may include penicillin, amoxicillin, moxifloxacin or a third generation cephalosporin. In patients presenting with clinical syndromes suggesting colitis, particularly if severe or affecting a high-risk group, ciprofloxacin or another fluoroquinolone should be prescribed empirically. These empiric treatment regimens do not provide adequate coverage for S. pneumoniae, which is a rare pathogen in these setting. Nonetheless, it is important to consider this organism in the differential diagnosis particularly for patients with risk factors for invasive pneumococcal infection or with a concomitant respiratory infection at presentation.</td>
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<tr>
<td>3</td>
<td>41 F</td>
<td>Vomiting, diarrhoea, fever, abdominal pain, myalgia</td>
<td>Proctitis. Penicillin allergy</td>
<td>Metronidazole</td>
<td>Pelvic pus PCR, Urine Ag^b, Ascites Ag</td>
<td>Predominant gram-positive diplococci on stool microscopy.</td>
<td>This case series highlights that S. pneumoniae is a rare but important cause of intraabdominal infection. The disease is more common in females. Risk factors include an indwelling IUD, long term steroid use or immunocompromise. Empiric therapy for pneumococcal disease may include penicillin, amoxicillin, moxifloxacin or a third generation cephalosporin. In patients presenting with clinical syndromes suggesting colitis, particularly if severe or affecting a high-risk group, ciprofloxacin or another fluoroquinolone should be prescribed empirically. These empiric treatment regimens do not provide adequate coverage for S. pneumoniae, which is a rare pathogen in these setting. Nonetheless, it is important to consider this organism in the differential diagnosis particularly for patients with risk factors for invasive pneumococcal infection or with a concomitant respiratory infection at presentation.</td>
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<tr>
<td>4</td>
<td>49 F</td>
<td>Vomiting, diarrhoea, fever, abdominal pain, myalgia</td>
<td>Nil significant</td>
<td>Metronidazole</td>
<td>Pelvic pus PCR, Urine Ag^b, Ascites Ag</td>
<td>Predominant gram-positive diplococci on stool microscopy.</td>
<td>This case series highlights that S. pneumoniae is a rare but important cause of intraabdominal infection. The disease is more common in females. Risk factors include an indwelling IUD, long term steroid use or immunocompromise. Empiric therapy for pneumococcal disease may include penicillin, amoxicillin, moxifloxacin or a third generation cephalosporin. In patients presenting with clinical syndromes suggesting colitis, particularly if severe or affecting a high-risk group, ciprofloxacin or another fluoroquinolone should be prescribed empirically. These empiric treatment regimens do not provide adequate coverage for S. pneumoniae, which is a rare pathogen in these setting. Nonetheless, it is important to consider this organism in the differential diagnosis particularly for patients with risk factors for invasive pneumococcal infection or with a concomitant respiratory infection at presentation.</td>
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| *Systemic Lupus Erythematosus | ^Large Loop Excision of the Transformation Zone | ^Cervical Intraepithelial neoplasia | ^Gastrointestinal \ Thrombocytopenic Purpura | ^Intra Uterine Device | ^Polymerase Chain Reaction | ^Antigen | ^Red Blood Cell | ^White Blood Cell |

Discussion

We describe a series of four women with pneumococcal abdominopelvic infections with a spectrum of disease ranging from enteritis to severe purulent peritonitis. Primary pneumococcal peritonitis has been described in children, and more rarely in adults [5]. Risk factors include nephrotic syndrome or cirrhosis, and to a lesser extent peritoneal dialysis, rheumatoid arthritis or bone marrow transplant [5, 6].

The mode of entry of S. pneumoniae into the peritoneal cavity is contentious. One possible route is hematogenous spread from a respiratory focus, with secondary enteritis. Cleveland et al. reported that 24% of patients with bacteraemic pneumococcal pneumonia had diarrhoea [9], suggesting that pathogenesis may be related to a secretory diarrhoea without direct invasion of S. pneumoniae into the bowel wall. This is distinguished from disease caused by direct pneumococcal invasion of the intestine, which may present with appendicitis, enteritis or peritonitis [2, 5]. However, it is not clear to what extent S. pneumoniae may colonize the gut and through what mechanisms it may invade the bowel mucosa [2].

In adults, there is a female preponderance of cases as highlighted by the case series presented here [4, 5]. The female preponderance of pelvic-abdominal pneumococcal infection raises the possibility of translocation from the female genital tract as an important route of invasive disease [4, 5].

In Australia, the introduction of the 7-valent pneumococcal conjugate vaccine (7vPCV) has had a significant reduction in the rates of invasive pneumococcal disease (IPD). Two cases presented were at increased risk for IPD due to underlying immunocompromise secondary to prednisone therapy, as well as anatomical asplenia. Only a single case in our series had received prior pneumococcal vaccination.

Conclusions

This case series highlights that S. pneumoniae is a rare and important cause of intraabdominal infection. The disease is more common in females. Risk factors include an indwelling IUD, long term steroid use or immunocompromise. Empiric therapy for pneumococcal disease may include penicillin, amoxicillin, moxifloxacin or a third generation cephalosporin. In patients presenting with clinical syndromes suggesting colitis, particularly if severe or affecting a high-risk group, ciprofloxacin or another fluoroquinolone should be prescribed empirically. These empiric treatment regimens do not provide adequate coverage for S. pneumoniae, which is a rare pathogen in these setting. Nonetheless, it is important to consider this organism in the differential diagnosis particularly for patients with risk factors for invasive pneumococcal infection or with a concomitant respiratory infection at presentation.

References