

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

	Case 1	Case 2	Case 3	Case 4
Age (years) and gender (M/F)	37 F	40 F	41 F	49 F
Presenting symptoms	Vomiting, diarrhoea, fever, abdominal pain, coryza, myalgia	Vomiting, diarrhoea, fever, abdominal pain	Vomiting, diarrhoea, fever, abdominal pain	Diarrhoea, fever, abdominal pain, myalgia, headache
Background history	SLE ^a , pericarditis, pleuritis, depression, LLETZ ^b procedure for CIN ^c	Splenectomy for ITP ^d 10 years prior, Penicillin allergy	Proctitis. Penicillin allergy	Nil significant
Peak CRP (mg/L)	316	153	>250	485
Lactate (mmol/L)	1.2	4.6	Not done	3.3
Peak/ WCC (10 ⁹ /L)	17.5	43	30	17.5
Pneumococcal vaccination status	Unknown	Pneumovax23 3 years prior	Unknown	Not vaccinated
IUD ^e present	No	No	Yes	No
Regular Medications	Prednisone 5mg Escitalopram	Prednisone 25mg	Mesalazine	Nil
Clinical disease	Peritonitis, Salpingitis	Sigmoid colitis, pneumonia	Enteritis, peritonitis	Enteritis
Bacteraemia	<i>S. pneumoniae</i> 15B	<i>S. pneumoniae</i> 23B	<i>S. pneumoniae</i> 3	<i>S. pneumoniae</i> 3
Microbiology for pneumococcus	Pelvic pus PCR ^f Urine Ag ^g Ascites Ag		Urine Ag Blood Ag Stool Ag Ascites Ag	Urinary Ag Stool Ag
Stool investigations			Predominant gram-positive diplococci on stool microscopy.	Stool microscopy and culture negative, nil organisms, RBC ^h or WBC ⁱ seen
Directed treatment	Exploratory laparotomy. Benzyl penicillin	Moxifloxacin	Cefotaxime, lincomycin. Drainage of intraabdominal collections	Ceftriaxone, metronidazole

^aSystemic Lupus Erythematosus, ^bLarge Loop Excision of the Transformation Zone, ^c Cervical Intraepithelial neoplasia, ^d Idiopathic Thrombocytopenic Purpura ^e Intra Uterine Device ^f Polymerase Chain Reaction, ^g Antigen, ^h Red Blood Cell, ⁱ 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. One case in our series had an infiltrate on chest x-ray raising the possibility of 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 (7xPCV) has led to 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 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 macrolides are commonly 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

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