fortune Journals

Case Report

JOURNAL OF SURGERY AND RESEARCH

ISSN: 2640-1002

Streptococcus Pyogenes Primary Peritonitis: A paediatric Case Report

Arad Khodarahmi[1*] and Rahdakrishnan Nair[2]

Abstract

Introduction: Primary peritonitis is an uncommon condition in the paediatric population, typically caused by Gram-negative organisms, but very rarely caused by Gram-positive organisms, such as in this case of a 15-year-old female with *Streptococcus pyogenes* primary peritonitis. This rare condition poses a significant diagnostic challenge for surgeons reviewing such patients.

Case Presentation: This case report details a 15-year-old, previously healthy female presenting with abdominal pain, fever, and gastrointestinal symptoms. Patient vitals and significantly raised inflammatory markers raised concerns for sepsis. Empirical intravenous (IV) broad-spectrum antibiotics were promptly initiated. Same-day diagnostic laparoscopy revealed four-quadrant purulent peritonitis with no apparent source, and cultures were obtained. Postoperatively, the patient was treated with a targeted antibiotic regimen based on culture results, identifying *S. pyogenes* as the causative organism. The patient demonstrated marked clinical improvement and was discharged with oral antibiotics. Follow-up confirmed resolution of symptoms and normalisation of inflammatory markers.

Discussion: This case underscores diagnostic challenges posed by *S. pyogenes* primary peritonitis, particularly due to its rarity and clinical resemblance to appendicitis or pelvic inflammatory disease. Preoperative diagnosis is seldom made, with confirmation typically reliant on intraoperative findings and cultures. Literature review revealed only 46 reported English language cases of Group-A Streptococcus primary peritonitis since 1980, predominantly in female paediatric patients. Delay in diagnosis and treatment results in severe complications such as Streptococcal Toxic Shock Syndrome.

Conclusion: This case highlights the importance of early empirical broad-spectrum antibiotic therapy in suspected primary peritonitis cases. This ensures prompt treatment while awaiting definitive culture results, improving patient outcomes.

Keywords: Peritonitis; Primary peritonitis; *Streptococcus pyogenes*; Streptococcal infection; Streptococcal infections; Group A Streptococcal infection; Group A Streptococcal infections; General Surgery; Female; Human

Introduction

Primary peritonitis, an infection within the peritoneal cavity, is an uncommon condition in the paediatric population, typically caused by Gram-negative organisms, but very rarely caused by Gram-positive organisms, such

Affiliation:

[1]Department of General Surgery, Austin Health, Victoria, Australia

[2]Department of General Surgery, Central Gippsland Health Service, Victoria, Australia

***Corresponding author:**
Arad Khodarahmi, Department of General Surgery, Austin Health, Victoria, Australia.

Citation: Arad Khodarahmi, Rahdakrishnan Nair. Streptococcus pyogenes primary peritonitis: A paediatric case report. Journal of Surgery and Research. 8 (2025): 111-113.

Received: January 27, 2025
Accepted: February 03, 2025
Published: February 14, 2025

Khodarahmi A and Nair R., J Surg Res 2025
DOI:10.26502/jsr.10020426

as in this case of a 15-year-old female with Streptococcus pyogenes (S. pyogenes) primary peritonitis. This rare condition poses a significant diagnostic challenge for surgeons reviewing such patients.

Case: A 15-year-old, previously healthy Caucasian female patient is presented in this case.

She was brought to the emergency department by a parent with a one week history of gradually worsening, crampy, non-migratory abdominal pain that was worse in the right iliac fossa. This was associated with bouts of intermittent vomiting, watery diarrhoea, fevers, and loss of appetite.

There was no abnormal per-vaginal discharge or bleeding noted, with her last menstrual period started 2 weeks prior to presentation and had ended after 7 days with no changes to her regular cycle. She was sexually active with a single male partner with barrier protection (condoms) always utilised, neither partner had prior STI testing. The oral contraceptive pill (OCP) she normally took was ceased 2 weeks ago with no new contraceptive agents started and none prior to starting the OCP. She noted no urinary symptoms, no coryzal symptoms, and no rash. No recent travel or sick contacts were had. Her only past medical history was iron deficiency anaemia that was being treated with oral iron supplementation and no prior operations had been performed. She had no allergies. No significant family history was noted. The patient did not smoke, drink alcohol, or take recreational drugs.

On presentation, temperature was 39°C, heart rate was 120 beats per minute, blood pressure was 85/49, saturations 99% on room air, and respiratory rate was 16. On physical examination, she seen be a young female of slight build, agitated from pain, and subjectively pale. Her abdomen was distended, firm, and was globally tender with non-voluntary guarding.

In the emergency department, white cell count was 12.7x109/L with neutrophilia at 11.9x109/L. CRP was 238 mg/L. Microcytic anaemia was noted with a haemoglobin of 107 g/L with a MCV of 75fL. Lactate was 1.4. Urea/electrolytes/creatinine and liver function testing was unremarkable. Urine analysis was negative for leucocytes or nitrates and bHCG was negative for pregnancy. No imaging was done during her admission.

She received empirical broad-spectrum IV antibiotics with Augmentin 1000/200mg in the emergency department, as well as 2L intravenous crystalloid fluid resuscitation. She also received analgesia and antiemetics.

She was subsequently reviewed by the general surgical team and taken for a diagnostic laparoscopy on the same day by a consultant general surgeon. The operation revealed four quadrant purulent peritonitis with a normal appendix and abdominal organs were grossly normal. Gynaecological organs were grossly normal. Fluid samples were taken for MCS analysis and the abdomen was washed with 3L of normal saline. High vaginal swabs were also taken with a differential of PID.

IV antibiotic coverage was changed to IV Ceftriaxone, Metronidazole, and Azithromycin.

Patient continued to improve following 5 days total of IV antibiotic therapy and discharged home day 4 post operative. They were discussed with the local Infectious Diseases team and were subsequently stepped down to oral cefalexin, metronidazole, and doxycycline on discharge.

She was followed up via telehealth 5 days after discharge with the results of her peritoneal fluid MCS and high vaginal swabs having returned. The vaginal swabs were negative for gonorrhoea and chlamydia, and peritoneal fluid MCS was also negative for these. However, the peritoneal fluid did come back positive for Streptococcus pyogenes (sensitive to clindamycin, erythromycin). They were at this point rediscussed with the infectious diseases consultant and only oral cefalexin was continued for a further 5 days. They were reviewed by a general practitioner after antibiotics had ceased. At this time, she had improved clinically back to baseline and inflammatory markers were back within normal levels, hence antibiotic therapy was ceased. She has had no further issues (including recurrence) since and is not planned for any further follow-up at the time of writing.

Discussion

Primary peritonitis is infection within the peritoneal cavity not directly related to other intra-abdominal abnormalities, often monomicrobial, and is usually seen secondary to Gram-negative organisms. It accounts for less than 1-2% of paediatric abdominal emergencies, making it an increasingly rare phenomenon [1-3]. *Streptococcus pyogenes*, in the absence of risk factors including trauma, immunosuppression, or prior ascites, is not a common cause for primary peritonitis in children. However, it is an aggressive mimic to appendicitis and PID given similarities in symptomology. More commonly, the beta-haemolytic pathogen is associated with pharyngitis and various skin infections. While aetiology is uncertain, it has been speculated to spread via haematogenous, lymphatic and transmural means [4,5] S. pyogenes causing primary peritonitis is quite rare in the paediatric population. 46 of Group A Streptococcus primary peritonitis reported in English literature since 1980. 55-84% of cases previously identified in paediatric patients are in females [1,2,4-20]

Diagnosis of GAS primary peritonitis preoperatively as a cause for paediatric abdominal pain is rare. This is due to the infrequency of S. pyogenes as a causative organism in primary peritonitis, coupled with the abundance of other more prevalent differentials such as appendicitis. Difficulty

in diagnosis and delay in appropriate treatment may lead to Streptococcal Toxic Shock Syndrome which carries with it a significant risk of severe complications and even death. Diagnosis often occurs post laparoscopic investigation and culturing of peritoneal fluid samples, such was the situation in this presented case. Broad-spectrum antibiotic coverage would be advocated for once diagnosis of primary peritonitis is made, until such time culture showing species and sensitivities return [2-4].

Conclusion

An unusual case of *Streptococcus pyogenes* primary peritonitis in a 15-year-old child is reported.

This phenomenon presents a diagnostic challenge for clinicians given its rarity and clinical mimics. Hence, an approach involving early use of broad-spectrum antibiotics is recommended in cases of clinical uncertainty until confirmation of diagnosis and return of causative organisms from cultures.

Funding: None

Conflict of Interest

All authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as potential conflicts of interest.

References

1. Khilji M. Primary Peritonitis-A Forgotten Entity. European Journal of Pediatric Surgery Reports 8 (2014): 27-29.
2. Sharp EA, Linn A, Zitelli BJ. Group A streptococcal pharyngitis associated with primary peritonitis. BMJ Case Reports 12 (2019): e229186.
3. Baird R, Haddock CA. Primary Peritonitis. Pediatric Surgery NaT. Pedsurglibrary.com 2 (2020).
4. Taylor A, Elliott BM, Atkinson J, et al. Group A Streptococcus Primary Peritonitis in Children, New Zealand. Emerging infectious diseases 29 (2023).
5. Dann PH, Amodio JB, Rivera R, et al. Primary bacterial peritonitis in otherwise healthy children: imaging findings. Pediatric radiology 35 (2005): 198–201.
6. Tapiainen T, Launonen S, Renko M, et al. Invasive Group A Streptococcal Infections in Children 35 (2016): 123-128.
7. Holtestaul T, Langs-Barlow A, Barlow M. Group A streptococcal primary peritonitis in an otherwise healthy adolescent female. Journal of Pediatric Surgery Case Reports 64 (2021): 101729.
8. Liang TC, Lu CY, Lu FL, et al. Streptococcal toxic shock syndrome manifesting as peritonitis in a child. Journal of the Formosan Medical Association Taiwan 101 (2002): 509-513.
9. Freij BJ. Primary Peritonitis in Previously Healthy Children. Archives of Pediatrics & Adolescent Medicine 138 (1984): 1058.
10. Harnden A, Lennon D. Serious suppurative Group A streptococcal infections in previously well children. The Pediatric Infectious Disease Journal 7 (1988): 714-718.
11. Torres-Martinez C, Mehta D, Butt A, et al. Streptococcus associated toxic shock. Archives of Disease in Childhood 67 (1992): 126-130.
12. Watson WJ, Powers KS. Primary peritonitis associated with streptococcal toxic shock-like syndrome. Clinical pediatrics 38 (1999): 175-177.
13. Gillespie RS, Hauger SB, Holt RM. Primary group A streptococcal peritonitis in a previously healthy child. Scandinavian journal of infectious diseases 34 (2002): 847-848.
14. Sewrey H, Bryant PA. Group A streptococcus causing primary peritonitis in a healthy infant. The Pediatric infectious disease journal 28 (2009): 1146.
15. Demitrack J. Primary Group A Streptococcal Peritonitis in a Previously Healthy Child. The Pediatric Infectious Disease Journal 31 (2012): 542-543.
16. Holden R, Wilmer A, Kollman T. Primary Peritonitis due to Group A Streptococcus in a Previously Healthy Pediatric Patient. Canadian Journal of Infectious Diseases and Medical Microbiology 23 (2012): e69-70.
17. Patel RV, Kumar H, More B, et al. Primary group A streptococcal septic shock syndrome simulating perforated appendicitis in a previously healthy girl. BMJ case reports (2013).
18. Benidir A, Lim R. Case 1: A 16-year-old female with left lower-quadrant abdominal pain. Paediatrics & child health 19 (2014): 19-20.
19. Filan E, Abbas M. Abdominal pain, fever, and infection secondary to an unusual source in a previously healthy child. Clinical pediatrics 53 (2014): 607-609.
20. Haskett H, Delair S, Neemann K. Primary group A streptococcal peritonitis in a previously healthy female teenage patient. Glob Pediatr Health 7 (2020): 233.