The diagnostic and therapeutic challenges of Spontaneous Bacterial Peritonitis in a low income country: A case report

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ABSTRACT

Background: Spontaneous bacterial peritonitis is an uncommon condition. It has a non-specific clinical presentation which leading sometimes to an unnecessary laparotomy especially in a low income country.

Case presentation: We received a 19-months old child, with an unremarkable past medical history, admitted in our service for a 2-day history of abdominal distension and fever. She presented with guarding and abdominal tenderness. Abdominal ultrasound revealed a peritoneal effusion and signs of intestinal occlusion without obstacle to peristalsis. A blood culture revealed Streptococcus sp as etiology and we made a diagnosis of spontaneous bacterial peritonitis. The patient recovered after medical treatment.

Conclusion: Spontaneous bacterial peritonitis is a possible diagnosis that clinicians should bear in mind during investigation of an acute abdomen. Accurate initial diagnosis can avert unnecessary surgery, since treatment is medical.

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Introduction

Spontaneous bacterial peritonitis (SBP) or primary peritonitis is an infection of the peritoneal cavity not directly related to other intra-abdominal abnormalities [1]. It accounts for 1 to 2% of all pediatric abdominal emergencies [1,2]. SBP commonly occurs in infancy and early childhood, in cirrhotic patients and immunocompromised hosts, whereas secondary peritonitis is usually associated to intra-abdominal lesions, such as perforation of the hollow viscus, bowel necrosis, nonbacterial peritonitis, or penetrating infectious processes [3].

As other types of peritonitis, SBP is a diagnostic and therapeutic emergency but its treatment is only medical. However, SBP is infrequently considered in the differential diagnosis of peritoneal sepsis and rarely diagnosed preoperatively [4]. In Africa particularly, secondary peritonitis is very common and not always differentiated from primary leading sometimes to an unnecessary laparotomy [5]. The diagnosis of SBP is therefore a challenge in low income countries because of the consultation delay and the paraclinical exams which are not always possible. We report the case of a spontaneous primary peritonitis in a 19-months old child, who
was diagnosed and managed medically with a favourable clinical outcome.

**Case presentation**

A 19-months old female girl was brought for consultation by her mother for a 2-day history of abdominal distension, fatigue, and fever of sudden onset. Those symptoms had persisted, despite administration of acetaminophen and enema with unknown traditional herbs at home. Her condition worsened over time with a progressive painful abdominal distension, and this motivated consultation in our hospital.

Her past medical history revealed an unremarkable neonatal period from a singleton pregnancy. However, she had been transfused twice for severe malaria at 6 and 8 months of age. The mother did not complain of diarrhoea or vomiting.

On admission, she was conscious, ill-looking and weighed 11 kg. She had a fever of 38.9°C. She had acute respiratory distress with nasal flaring, grunting and intercostal retraction, a respiratory rate of 84 cycles-per-minute and an oxygen saturation of 89%. She was pale with a distended abdomen (abdominal circumference of 54cm). We noted diffuse abdominal tympanism, tenderness, guarding and reduced bowel sounds.

We made a diagnosis of acute abdomen. Biological exams revealed on full blood count a severe microcytic normochromic anemia at 3.9g/dL and high leucocyte count at 11.65G/L with a predominance of neutrophils; serum creatinine and urea levels, blood electrolytes, prothrombin time and activated partial thromboplastin time were all normal. A plain abdominal radiography (figure 1) showed air-fluid levels. Abdominal ultrasound showed aperistaltic bowels and a peritoneal effusion between bowel loops with no obstacle to peristaltism.

With these elements, we thought of a primary peritonitis and started a medical treatment in our intensive care unit. A nasogastric tube was placed for gastric emptying over 72 hours, and she was transfused and rehydrated with adequate fluids. We also initiated a probabilistic antibiotherapy with ceftriaxone at 50mg/kg/day once daily, metronidazole 30mg/kg/day 3 times per day, and gentamicin 5mg/kg/day once daily. On day 3 of admission, the fever ceased and respiratory distress regressed. The abdominal circumference had reduced from 54 to 49 cm. An abdominal ultrasound done on the same day was normal. On day 5, she was transferred to the paediatrics unit, while waiting for the results of the blood cultures which showed *Streptococcus sp* sensitive to erythromycin, vancomycin, fucidic acid, rifampicin and tetracyclin. We added erythromycin 30mg/kg/day once daily to the treatment. By day 10, the child was clinically stable, afebrile and feeding well. She was discharged on day 12 with oral erythromycin and iron supplementation at 6mg/kg/day for 3 months. She was seen at 1 week and 1 month after discharge, and she was well and had no complaint.

*Figure 1: Plain abdominal radiograph showing air-fluid levels. *Air-fluids levels*

**Discussion**

SBP had a very high mortality and morbidity, representing 10% of all pediatric emergencies in the pre-antibiotic era [6]. Widespread use of antibiotics
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has drastically reduced this incidence, making it a rare condition nowadays [2,4]. Few reports, of this condition are available. McDougal et al reported in the 1970s, an incidence of 14% for primary peritonitis among cases of diffuse peritonitis [4]. More recently, of 182 Ghanaian children with peritonitis, 3 (1.6%) of children had primary peritonitis[7], and in a report of 955 children under 15 years operated in Nigeria for an abdominal emergency, 10 (1%) were affected [5].

SBP affects mostly girls aged 4 to 9 years [1], usually with an underlying condition (nephrotic syndrome, liver cirrhosis or immunodeficiency)[8]. Rarely, it can occur in previously healthy children. Among the 31 cases of SBP reported by Sen and al, a sex ratio of nearly 7 girls for 1 boy, mainly aged 4 to 10 years was found [9]. 70% of previously healthy children with primary peritonitis in Ofori-Kuma’s cohort, were aged 6 to 10 years [10].

Origins of bacterial seeding in SBP is variable and, depend on the clinical condition of the patient. In healthy girls, bacteria may migrate from the vagina through the fallopian tubes to reach the peritoneum, as a consequence of poor perineal hygiene [11]. It is possibly the source of our patient’s SBP. In nephrotic syndrome or cirrhosis, transmigration of bacteria from the intestine into the ascitic fluid is the main mechanism of contamination, favoured by the depressed immunity related to these conditions[11]. Other routes of inoculation include blood or lymph.

SBP is usually monomicrobial, *Streptococcus pneumoniae* being the main cause in healthy children. Other common germs include *Staphylococcus aureus*, group A Streptococcus and gram-negative organisms (*Escherichia coli, Klebsiella pneumoniae*) as well as anaerobes [10,11]. Peritoneal fluid culture is of critical importance in the diagnosis of SBP. However, as blood culture, it is characterized by low microbial concentration and is therefore frequently negative [12–15]. Fortunately, we were able to identify *Streptococcus sp.* on blood cultures.

Excluding secondary causes is a priority in the presence of signs of peritonitis. In this light abdominal ultrasound identify any localized abscess or secondary causes, and, plain abdominal radiographs usually show dilated intestinal loops. Contrast-enhanced computed tomography can also show intraperitoneal fluid, dilated bowel, and peritoneal enhancement [5]. Our patient’s plain X-ray showed bowel air-fluid levels and no obstacle to peristalsis on abdominal ultrasound. Biologic inflammatory syndrome [5] and identification of the causative germ in ascitic fluid, peritoneal fluid or blood are key elements to the diagnosis. When the findings are insufficient to rule out secondary peritonitis, a diagnostic laparoscopy is preferred [16,17].

Antibiotic therapy and resuscitative measures are essential parts of treatment. Empirical antibiotic therapy for SBP includes a 3rd generation cephalosporin, broad-spectrum penicillin or ampicillin plus an aminoglycoside [18,19]. Improvement should be observed within first 24 hours of start of antibiotics [1]. If not, a laparotomy or laparoscopy should be done with thorough peritoneal lavage and a meticulous search for a secondary cause [11]. Our patient showed rapid improvement on initial parenteral antibiotic therapy; so, there was no need for surgery.

**Conclusion**
Spontaneous bacterial peritonitis is a rare clinical entity especially in children. SBP occurs in children without any underlying condition and differentiating it from secondary peritonitis is a diagnostic challenge. Accurate evaluation of case of peritonitis is mandatory, as treatment is medical with appropriate antibiotics.

**Declarations**

**Ethics approval and consent to participate:** not applicable.

**Consent for publication:** Written informed consent was obtained from the patient’s legal guardian(s) for publication of this case report and any accompanying images. A copy of the written
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consent is available for review by the Editor-in-Chief of this journal.

**Availability of data and material:** Please contact author for data requests.

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**References**


