PNEUMOCOCCAL PERITONITIS DIAGNOSED BY RT-PCR IN A MALNOURISHED CHILD

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BACKGROUND – Spontaneous bacterial peritonitis (SBP) is an uncommon manifestation of invasive pneumococcal disease and frequently occurs when an underlying hepatic disease is present. Despite the growing use of real-time polymerase chain reaction (qPCR) to increase detection of *Streptococcus pneumoniae* in CSF and pleural effusion, there are few descriptions of its use in peritoneal fluid. Such molecular approach that identifies a pneumococcal etiology among culture negative cases offers increased precision in invasive pneumococcal disease diagnosis. A culture-negative spontaneous pneumococcal peritonitis without preexisting peritoneal disease diagnosed by a multiplex qPCR assay using lytA gene primer is herein described.

CASE REPORT – A 2-year old girl was admitted to our service for a 3-day history of abdominal distension, high and recurrent fever (39.5°C), vomit and inappetence. She was severely dehydrated and hypoactive, and presented tachycardia (CR = 160 bpm), tachypnea (RR = 60 ipm), and distended and painful abdomen at examination – no peritoneal inflammation signs were evidenced. The additional parameters of the clinical examination were unremarkable. She had no underlying conditions or previous hospitalization. However, she took a vegan diet, presented with failure to thrive (BMI index = –3,38), undernutrition and an 2+0 pneumococcal immunization series (recommended schedule in Brazil was 3+1). Laboratory evaluation evidenced severe leucopenia (1150 WBC/mm³), C-reactive protein=40.1 mg/dL (reference <0.5 mg/dL), bowel edema at abdominal X-ray and ultrasound, without free liquid in abdominal cavity. Urinalysis and lipid profiles were normal.

As the refractory septic shock of abdominal origin was evidenced, high dose ceftriaxone (100 mg/kg/day), metronidazole and ampicillin were empirically initiated. She was transferred to the intensive care unit, where she required ventilatory support, multiple vasoactive drugs (noradrenaline, adrenaline, dobutamine, and milrinone), hemodialysis and several blood transfusions. Within 48h hours from admission, exploratory laparotomy was performed, which identified a significant amount of fibrinopurulent secretion in the abdominal cavity, without signs of bowel perforation, acute appendicitis or any other apparent focus for the pyogenic infection. Appendectomy was performed, and histological examination evidenced no inflammatory process. Gram-stain at ascitic fluid did not identify bacteria.

Sustained hemodynamic and ventilatory improvement occurred on the 15th day of antimicrobial course. The patient was discharged after 25 days of combined treatment, with no residual sequelae. Despite all negative cultures (including blood culture before antibiotic use), *Streptococcus pneumoniae* was identified in the abdominal fluid collected five days after the laparotomy – and the 6th day of antibacterial treatment – by qPCR (Ct=28). The same essay was also performed in blood obtained in the same day, but came negative.

This multiplex assay was developed and performed at Instituto Adolfo Lutz and is composed of three sets of primers targeting meningococcal capsular transport gene (ctrA), pneumococcal autolysin gene (lytA), and *H. influenzae* polysaccharide capsular expression gene (bexA)

CONCLUSION – For evaluation of culture-negative peritoneal fluid aspirates, as the case described, qPCR is likely to have a very high specificity in peritoneal fluid since it´s uncontaminated by upper respiratory tract secretions. Applying bedside inoculation of blood culture bottles with ascitic fluid and molecular assays in community SBP can improve diagnosis of pneumococcal peritoneal infection, especially in settings of late sample collection and prior use of antibiotics.