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Caso clinico

Case report

A rare case of reactive pericardial effusion with cardiac tamponade subsequent to meningococcal meningitis

Un raro caso di versamento pericardico reattivo con tamponamento cardiaco secondario a meningite meningococcica

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INTRODUCTION

Meningitis is a severe disease affecting all ages and worldwide diffused. While *Streptococcus pneumoniae* in the major pathogenic microorganism involved in children meningitis [1-3], *Neisseria meningitidis* is responsible of epidemics in subsaharian Africa. Meningococcal disease in children might be a very severe condition leading to a rapidly progressive course. Most of the studies are focused on the acute phase and there is relatively little information about sub-acute or late extra-cerebral complications which are thought to be immune-complex mediated [4].

PATIENTS AND METHODS

A 8-month-old female was evaluated in the outpatients department of St. Luke Hospital (Wolisso, Ethiopia) for a three days history of fever, poor feeding and dyspnea. No other symptoms were reported. On physical examination, the child appeared awake, but irritable. Rectal temperature was 39°C; respiratory rate was 54 breaths/min and heart rate 150 beats/min.

There was no evidence of any upper respiratory tract infection. Nuchal rigidity was not present. Lung auscultation revealed bilateral basal crackles and rales and a moderate chest indrawing was found. Cardiac and abdominal physical examination was normal. According to the Integrated Management of Childhood Illnesses (IMCI), she was admitted to the Paediatric Ward as affected by severe pneumonia. Initial laboratory tests included a white blood cell (WBC) count with leucocytosis and neutrophilia (WBC 13.500 cells/mL, 86% of neutrophils). Malaria was excluded. A chest X ray showed bilateral pneumonia with a normal cardiac profile. Antibiotic therapy was started with intravenous ceftriaxone 100 mg/kg/day. As she did not improve after 48 hours from admission and became lethargic, a lumbar puncture was performed.

Cerebrospinal fluid (CSF) appeared turbid, Pandy reaction resulted positive with 25 WBC/HPF (high power field) and Gram-negative diplococci were identified as *N. meningitidis* (dosage of CSF protein and glucose are not available in our hospital, as well as antibiogram). Chloramphenicol 100 mg/kg/day was associated to ceftriaxone and the child started to recover. On the seventh hospital day, there was recurrence of fever up to 38°C. The patient

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developed acute dyspnea, with hypotension and tachycardia with muffled heart sounds and pulsus paradoxus. A new chest X ray showed an enlarged cardiac shape and an echocardiogram revealed a massive circumferential pericardial effusion with early cardiac tamponade. Pericardiocentesis was performed with drainage of about 60 mL of clear fluid that resulted negative both for Gram and Ziehl Nielsen stain. Culture of the fluid was not possible. Prednisone 1 mg/kg daily was administered for ten days with no recurrence of the pericardial effusion. The child was discharged on hospital day 23.

DISCUSSION

N. meningitidis is a Gram-negative diplococcus which is more commonly associated to sepsis and purulent meningitis [4, 5]. Other clinical syndromes caused by this pathogen include pneumonia, purulent infections of upper respiratory tract, but also endocarditis, myocarditis, pericarditis, osteomyelitis, the Waterhouse-Friderichsen syndrome, arthritis and skin infections. Reactive immune-complex mediated complications of meningococcemia most commonly present as arthritis and vasculitis. We can recognize three types of pericardial involvement in meningococcal disease: disseminated meningococcal disease with pericarditis (DMP), isolated meningococcal pericarditis (IMP) and reactive meningococcal pericarditis (RMP) [5-8].

The former two are purulent pericarditis, culture positive and blood borne, secondary to bacteraemia. While DMP represents a complication of a systemic meningococcal disease, IMP is due to pericardial invasion by *N.* meningitidis without signs of meningococcemia [5]. Both DMP and IMP are responsive to antibiotic treatment and both are usually evident within one week of onset of infection; DMP is more common in children and rarely associated to cardiac tamponade, this is instead a frequent complication of IMP [2]. The reactive form (RMP) is a late complication: it develops most frequently 6 to 15 days after onset of illness and it is characterized by a type 3 hypersensitivity reaction also called immune-complex associated complication (IAC) [4, 9]. It is a form of aseptic inflammation, with sterile culture negative effusion and it is not responsive to antibiotics. RMP may be more severe than DMP and IMP and cardiac tamponade can be relatively frequent. It responds to salicylates, but more severe cases with significant pericardial effusion require high dosages steroidal treatment and pericardiocentesis. All the immune-complex mediated complications of meningococcal disease are considered rare in children and most of the reported cases do not describe pericardial involvement [9]. In recent literature, the youngest case of cardiac tamponade as a delayed presentation of meningococcemia is actually a case of IMP [10].

The case described by the authors is the second report of RMP in a child less than 1 year old [11]. Despite the limited resources of the laboratory, the serous non purulent nature of pericardial effusion and the fact that no microorganisms were found on Gram and Ziehl Nielsen stain suggest a reactive form. The good clinical response of our patient to high dose steroidal therapy also supported the immune mediated pathogenesis of this complication. Even though the role of echocardiography in these forms of pericarditis is discussed, it was useful for the diagnosis and management of pericardial effusion [12]. It allowed us to estimate the severity of cardiac tamponade and to perform a safe ultrasound guided pericardiocentesis in such a young infant. Echocardiography was also useful to monitor the eventual recurrence of fluid in the pericardial space, as it was an easy, repeatable, bedside investigation even in our contest.

The incidence of pericardial involvement in meningococcal disease remains uncertain and there is a relative lack of studies on reactive complications after meningococcemia in children [5]. We suggest that late reactions to *N. meningitidis* might be more frequent than supposed in developing countries, where there is a higher incidence of meningococcal disease and meningococcal epidemics. However, difficult accessibility to hospital care and limited diagnostic tools may account for misdiagnosis and mistreatment, leading to unreliable estimates of these clinical entities.

Keywords: cardiac tamponade, meningococcal meningitis, immune complex, immune-mediated disease.

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SUMMARY

We report a case of cardiac tamponade in a child with meningococcal disease. Despite purulent meningococcal pericarditis is more frequent in children, we found a reactive pericardial effusion responsive to steroids and consistent with a rare immune-complex associated pericardial involvement.

RIASSUNTO

Viene descritto un caso di tamponamento cardiaco in un bambino successivo a meningite meningococcica. Nonostante nei bambini si verifichi più frequentemente una pericardite meningococcica, nel caso descritto è stato riscontrato un versamento pericardico reattivo con buona risposta alla terapia steroidea e compatibile con un raro interessamento pericardico da immunocomplessi.

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