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Letter to the Editor

Persistent inflammatory syndrome in pneumococcal meningitis

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1. Introduction

Reactive extrameningeal involvement in children infected with *Streptococcus pneumonia* is very rare. We report the case of a previously healthy 2 $^1/_2$ year old girl presenting with a history of fever, vomiting and headache for 3 days. On admission the child was febrile (temperature, 39°C), but hemodynamically stable. She was irritable. She had nuchal rigidity but no focal neurologic deficits. Ear nose and throat examination was normal. Her peripheral blood white cell count was 20,300/mm^3 with 85% neutrophils. The C-reactive protein (CRP) was 138 mg/L, and the erythrocyte sedimentation rate (ESR) 120 mm in the first hour. Examination of the cerebrospinal fluid (CSF) revealed 147 white blood cells/mm^3 with 90% neutrophils, with a protein level of 800 mg/dL, and a glucose level of 3.6 mg/dL (serum level 100 mg/dL). A Gram stain revealed gram-positive diplococci. A latex agglutination test was positive for pneumococcus. The CSF culture grew *S. pneumoniae*, the organisms were susceptible to ampicilline, cefotaxime, ceftriaxone, and vancomycin, but resistant to penicillin. Blood and urine cultures were negative. The child was treated with intravenous cefotaxime and vancomycin. The patient's condition improved; however, she remained febrile for 9 days after initiation of treatment. CRP, ESR, and platelets remained elevated. Brain computerized tomography scan with contrast, echocardiography, chest X-ray, bone scans, and repeated blood cultures were negative. CSF on day 4 showed 2560 leukocytes/mm^3 with 80% neutrophils, with a protein level of 500 mg/dL and a glucose level of 30 mg/dL (serum level 90 mg/dL). Gram stain, latex agglutination test, and culture were all negative. The child was treated for 14 days. CSF on day 14 was completely normal. Six weeks after completing treatment, the patient remained afebrile, with a normal physical examination, but the ESR was 116 mm in the first hour, the CRP was 132 mg/L, and the platelets were 692,000/mm^3. A repeated magnetic resonance imaging of the brain and spine, echocardiography, antinuclear antibodies, and complement levels were normal. The patient was started on aspirin (5 mg/kg q.d). The elevated inflammatory parameters returned to baseline within 10 days. The hearing screening test was normal.

Fever or raised inflammatory parameters after bacterial meningitis can be a sign of several complications such as secondary infection, subdural effusion, persisting infection, and drug allergy. The immune complex associated complications (IAC) should also be considered in the differential diagnosis. IAC can present as arthritis, pericarditis, vasculitis, or persistent fever and elevated inflammatory parameters. IAC is

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a common complication of meningococcal infections, and has been estimated in one series to be present in 15% of all children with meningococcal disease [1]. Persisting fever or raised inflammatory parameters in meningococcal infections as mentioned by Edwards and Bakes [2] are probably not a prognostic sign for development of IAC but a symptom of IAC per se, sometimes occurring before the symptoms of arthritis/vasculitis. These complications are, however, extremely rare in pneumococcal disease. A search in Pubmed using the keywords reactive arthritis, pericarditis, episcleritis, pleuritis, and persistent inflammatory syndrome combined with pneumococcal disease did not reveal any case report. IAC pathophysiology could involve an immunoallergic reaction with deposition of immune complexes. Antigen-antibody (immune) complexes cause an inflammatory reaction in tissue, leading to activation of complement and transmigration of polymorphonuclear leucocytes, resulting in tissue damage. Therapy consists of salicylates, steroids, or a combination of these [3]. Physicians should be vigilant for this condition; IAC often leads to a prolonged hospital stay and unnecessary diagnostic procedures and treatment.

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