

Puerperal Widespread Pyomyositis After Group A Streptococcal Toxic Shock Syndrome

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Key words: toxic shock syndrome, puerperal infection, Group A Streptococcus, intravenous immunoglobulin, pyomyositis

IMAJ 2008;10:483–484

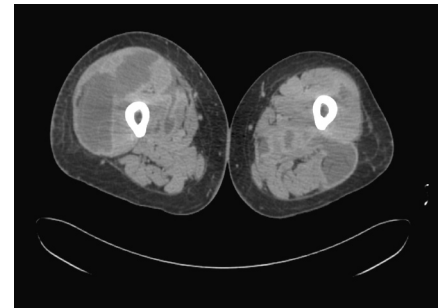
Group A Streptococcus is an aerobic Gram-positive coccus. These bacteria commonly cause pharyngitis and a wide spectrum of superficial soft tissue infections. Rarely, Group A Streptococcus causes severe infections such as necrotizing fasciitis and myositis. When these infections are accompanied by signs of shock and organ failure, they are termed the streptococcal toxic shock syndrome. We describe a case of puerperal Strep TSS, treated with antibiotics, supportive care and intravenous immunoglobulin. During the course of the illness the patient developed pyomyositis that was treated surgically. To the best of our knowledge, this is the first confirmed report of postpartum GAS pyomyositis in the literature.

Patient Description

A previously healthy 30 year old multiparous woman presented to her obstetrician 5 days postpartum with complaints of low back pain accompanied by abdominal pain. She was afebrile. Five days earlier she had undergone induction of labor for term premature rupture of membranes 5 hours before admission, followed by uncomplicated vaginal delivery of her fourth baby 3 hours later. Cervical culture was not taken before delivery. Her examination was unremarkable and she was discharged without any treatment. On the 10th day postpartum she was admitted to the hospital with a diagnosis of shock of unknown etiology. Her body temperature was 37°C, pulse 130 beats/minute and blood pressure 84/44. The patient appeared drowsy. Her physical examination

revealed diffuse crepitations in both lungs, mild tenderness of the abdomen, and no rash. Her white blood cell count was $12.56 \times 10^9/L$. She exhibited signs of multi-organ failure, including acute renal failure, mild elevation of liver enzymes, signs of diffuse intravascular clotting, hypoalbuminemia and hypocalcemia. A whole body computed tomography scan with injection of contrast material revealed bilateral alveolar infiltrates with no signs of pulmonary embolism.

With a suspected diagnosis of septic shock the patient was intubated, and supportive treatment and an antibiotic regimen of ceftriaxone plus clindamycin were initiated. She also received fresh frozen plasma and cryoprecipitate to improve her coagulation status. During the second day of hospitalization her temperature rose to 40°C and her white cell count was $17 \times 10^9/L$ with a marked left shift. She had normal platelets count, creatinine level was twice the normal range, and she developed polyarthritides and signs of adult respiratory distress syndrome. Her blood culture was positive for Group A Streptococcus. With a suspected diagnosis of Strep TSS, treatment with IVIG was initiated and she was referred to our tertiary medical center. After approximately 24 hours her medical condition started to stabilize, with temperature of 37.5°C, normal blood pressure and urine output of 0.6 ml/kg/hour. The regimen of ceftriaxone plus clindamycin was not altered. The patient was treated with IVIG to a total amount of 30 g (0.5 g/kg). Over the next few days her general condition improved gradually. On day 19 the patient



Widespread abscesses in the muscles of both thighs.

again became febrile. She complained of swelling and pain in her thighs. Physical examination and CT scan confirmed the diagnosis of pyomyositis of her left hand, as well as both thighs [Figure]. There was no evidence of thrombosis. Her creatine phosphokinase level was within normal limits. She was treated with antibiotics and percutaneous drainage of an abscess in her right thigh. Culture from that drainage did not yield any pathogen. Surgical debridement was later performed because the abscess did not fully resolve. The patient's general condition gradually improved and she was transferred to a rehabilitation unit.

Comment

Historically, Group A Streptococcus was a common cause of puerperal infection, being transferred by medical personnel from patient to patient. Nowadays outbreaks of puerperal infection with GAS are rarely reported, but there is concern that this pathogen may be acquiring greater virulence. Although most commonly described in patients who suffered minor trauma, surgical procedures, viral infection or injuries resulting in hematoma, few cases

Strep TSS = streptococcal toxic shock syndrome
GAS = Group A Streptococcus

IVIG = intravenous immunoglobulin

of puerperal Strep TSS are reported in the literature [1].

The specific virulence factors associated with Strep TSS have not been elucidated. The M protein, which is a protein anchored to the cell membranes, has been known for many years to be a virulent factor and strains of GAS lacking the protein are less potent. It has now been discovered that in addition to its antiphagocytic effect, M protein is released from the bacterial surface, forming aggregates with fibrinogen and causing substantial damage in animal models [2]. In addition to the M protein, three distinct forms of exotoxins that induce cytotoxicity and pyrogenicity have been identified, named, A, B and C.

Diagnosis of Strep TSS is based on recommendations made by the working group published in 1993 [3]. The mainstay of therapy for Strep TSS is supportive treatment, accompanied by antibiotics. Surgical exploration and debridement of suspected collection is mandatory. Group A Streptococcus remains susceptible to beta-lactam antibiotics. Although penicillin is effective in treating superficial GAS infections, severe GAS infections are associated with high mortality despite penicillin therapy. Clindamycin has several potential advantages over penicillin, including suppression of bacterial toxins. There is strong evidence to suggest that some of the toxins released by GAS act as super-antigens, promoting T cell activation and cytokine production and mediating shock and tissue damage.

Although specific commercial antibody preparations are not available, it has been demonstrated that gamma globulins inhibit tumor necrosis factor-alpha and interleukin-6 production, inhibiting monocytes and T cell activation. There are a few case reports that demonstrate better survival for patients treated with IVIG in cases of Strep TSS. In addition, a Cochrane review of randomized trials comparing polyclonal IVIG with placebo or no intervention, in

patients with bacterial sepsis or septic shock, demonstrated a significant trend toward reduction of mortality in patients treated with polyclonal IVIG. In order to examine the efficacy of treating Strep TSS with IVIG, a multi-center randomized placebo-controlled trial was initiated in Europe. The trial was prematurely terminated because of slow patient recruitment. Only 21 patients were recruited of whom 10 were treated with IVIG. The survival in the group treated with IVIG was 3.6-fold higher. Statistical significance was not reached, most probably due to the small number of participants and lack of statistical power [4]. This study and others support the use of IVIG in cases of Strep TSS.

Pyomyositis is a bacterial infection of skeletal muscle leading to abscess formation within skeletal muscle, characterized by swelling and pain of infected organs. Usually it involves the largest muscle groups located around the pelvic girdle and lower extremities. Although the majority of cases of pyomyositis are diagnosed in the tropics, the incidence of non-tropical pyomyositis is rising, probably due to the rising prevalence of immunocompromised patients, who account for 50–60% of non-tropical pyomyositis. *Staphylococcus aureus* is the causative organism in about 75% of cases of non-tropical pyomyositis, and GAS is the second leading cause on non-tropical pyomyositis [5]. Postpartum pyomyositis is a rare condition, and only two cases of *Staphylococcus* pyomyositis have been described in the literature. Pyomyositis must be distinguished from other streptococcal infections such as spontaneous gangrenous myositis, which causes gangrenous necrosis rather than abscess formation, more systemic toxicity and a worse prognosis, and necrotizing fasciitis which is an infection of the deep soft tissue and is characterized by an extremely tender area that is hot, swollen and erythematous. The mainstay of treating pyomyositis is surgical drainage

and proper antibiotic therapy. In this case, antibiotic therapy was initiated prior to the surgical drainage; therefore it is not surprising that cultures taken from the abscess were negative.

In summary, we present the case of a young healthy woman presenting with delayed onset of Strep TSS after uncomplicated delivery. Treatment in an intensive care setup with systemic antibiotics and IVIG was successful. Later she suffered from widespread pyomyositis – a rare complication of GAS infection that was treated surgically. Obstetricians should be aware of the possible dire consequences of postpartum GAS infection including Strep TSS and pyomyositis. They should be familiar with the different therapeutic modalities available, including the use of IVIG in cases of Strep TSS.

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