Unusual association of diseases/symptoms

Infective endophthalmitis due to Group G Streptococcal infection in a patient with metastatic ovarian carcinoma

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A woman with stage IV metastatic papillary serous ovarian cancer presented with fever, altered mental status, difficulty with vision and right knee pain. On physical examination, she had pain on palpation and with flexion and extension of the left knee and bilateral purulent, bilateral conjunctivitis. Vitreal ultrasound revealed dense opacities within the posterior vitreous detachment bilaterally. Aspiration of both the left knee and vitreous fluid from the left eye revealed Group G Streptococcus (GGS). Later blood cultures also revealed GGS, susceptible to both vancomycin and cephalosporins. She was started on broad-spectrum antibiotics. The patient was diagnosed with bilateral GGS endophthalmitis and was treated with vitreous injections of vancomycin and ceftazidime. The patient improved significantly after antibiotic treatment though vision was not restored. Given the loss of vision and recurrent metastatic ovarian cancer, she opted to pursue palliative care and passed away within the year.

BACKGROUND

Group G Streptococcal infections occur much less commonly than infection caused by Group A streptococci and are less common than infections caused by Group B and Group C streptococci. Group G streptococci are part of the normal flora of the pharynx, respiratory tract, female genitalia tract and other mucous membranes.¹ In several studies, 11–65% of patients with Group G Streptococcal infections were found to have an underlying malignancy.^{2–4} Group G streptococci are recognised as a relatively common cause of cellulitis, are the second most common cause of β -haemolytic streptococcal septic arthritis and prosthetic joint infection,⁵ and accounts for 8–11% of β -haemolytic streptococcal bacteremia.⁶ Previously, cases of Group G Streptococcus (GGS) endophthalmitis have been reported, but to our knowledge, this is the first case of GGS endophthalmitis in a patient with underlying ovarian cancer.⁷

CASE PRESENTATION

An older woman with a history of stage IV metastatic papillary serous ovarian cancer (grade II of IV) presented with acute renal failure and altered mental status. Her surgical history included a total abdominal hysterectomy with bilateral salpingo-oophorectomy, bilateral pelvic and para-aortic lymphadenectomy, omentectomy, liver biopsy and diverting ileostomy 3 years prior to her hospital admission. She had been treated postoperatively with a chemotherapy regimen of taxol and carboplatin. One week prior to hospitalisation, the patient began to develop generalised malaise, nausea and frequent vomiting. At that time, she also developed stickiness of both eyes, eye pain and vision limited bilaterally to light and dark perception only.

The patient was initially afebrile; her temperature later spiked to 39.8°C. On examination, she was confused and

disoriented with regard to location and time. Examination of the cardiac, respiratory and abdominal systems did not reveal any obvious abnormality. The patient had pain on palpation and with flexion and extension of the left knee. Erythema was noted on the right forearm consistent with cellulitis. Bilateral conjunctivitis, with erythema and purulent exudate, was also present.

INVESTIGATIONS

Laboratory investigations on the day of admission revealed a creatinine level of 3.7 mg/dl and a blood urea nitrogen of 70 mg/dl. Lactate level was within normal limits. The initial chest x-ray was unremarkable. Blood cultures at the time of admission showed gram-positive cocci resembling Streptococcus in 6/6 bottles after 7 h. Later speciation revealed Streptococcus Group G species.

Joint fluid aspiration of the left knee was performed and revealed cloudy joint fluid with 42 886 total nucleated cells per microliter and a neutrophil count of 86%. Gram stain showed many white blood cells without organisms and joint fluid cultures were negative. Empiric antibiotics were started after blood cultures were drawn but prior to joint aspiration, which was thought to have possibly sterilised the joint fluid.

Cultures of vitreal fluid aspirated from both eyes yielded GGS susceptible to penicillins, cephalosporins and vancomycin with minimum inhibitory concentrations (MICs) of ≤ 0.06 , ≤ 0.5 , ≤ 1 , respectively, and resistant to erythromycin, MIC >0.5 . A vitreal ultrasound revealed dense opacities within the posterior vitreous detachment bilaterally and preretinal membrane with underlying opacities throughout the posterior pole and vitreous membrane temporally in the right eye. A non-contrast CT showed inflammatory changes of the preseptal spaces of the orbits.

DIFFERENTIAL DIAGNOSIS

Group A Streptococcus (GAS) infection presents similarly to GGS as cellulitis, sepsis, or septic arthritis, and should be considered in the differential diagnosis. Once the diagnosis of GGS infection is established, evaluation should be performed to identify an occult underlying malignancy or immunocompromised condition.

TREATMENT

The patient was treated aggressively with intravenous fluid hydration and started on empiric antibiotics with piperacillin-tazobactam, ciprofloxacin and vancomycin and ciprofloxacin (eyedrops). An ophthalmology consult was obtained, a vitreal fluid aspiration was performed, and the patient was treated with intravitreal injections in both eyes with vancomycin and ceftazidime. Ciprofloxacin eyedrops were discontinued, and moxifloxacin eyedrop therapy was initiated.

OUTCOME AND FOLLOW-UP

The patient's mental status significantly improved following fluid and antibiotic treatment. The patient's creatinine improved following fluid treatment to 2.7 mg/dl, and she remained non-oliguric.

After negative blood cultures, a percutaneous intravenous central catheter was placed in anticipation of a 6 week course of intravenous therapy with ceftriaxone 2 g per day. Because of the sudden permanent loss of vision bilaterally and the advanced recurrent metastatic ovarian cancer, the patient decided to receive palliative care only and did not wish to pursue chemotherapy. She was not a candidate for ophthalmologic surgery. The patient was dismissed to a skilled nursing facility with long-term amoxicillin prophylaxis after completing the ceftriaxone treatment course. She passed away within the year.

DISCUSSION

Large colony GGS were first isolated from patients with puerperal pneumonia in the 1930s.⁸ They are usually, but not exclusively, β -haemolytic. However, unlike GAS, group G isolates are variable in their bacitracin sensitivity.^{9 10} Group G streptococci are part of the normal flora of the skin, oral cavity, nasopharynx, gastrointestinal tract and vagina in humans.¹¹ However, the majority of GGS species are potentially pathogenic in humans.

Increased reporting of GGS has occurred in recent years due to improvements in laboratory techniques and to an increase in the population of patients at risk for GGS infection, and the increased recognition of GGS as a cause of infections in humans. GGS infections are now recognised with increasing frequency in older patients, those with immunocompromised conditions, and as postoperative infections.¹² However, Group A streptococci and Group B streptococci are more common than GGS as a cause of cellulitis, septic arthritis and infections of native or prosthetic joints and osteomyelitis.¹³ Another study conducted in Jerusalem retrospectively identified 94 cases of Group G Streptococcal bacteremia in 84 patients, of which approximately 61 percent associated with cellulitis as the source of infection.¹⁴ In both of these studies, over 92 percent of the patients with GGS infection had an underlying predisposing medical condition, most often malignancy or diabetes

mellitus. Bloodstream infections can occur with group G streptococci infection (with or without an overt clinical focus) as well, although less commonly than GAS or Group B Streptococcus.¹⁴

Mariani and colleagues reported 16 cases of GGS endophthalmitis but none of these were in patients with ovarian cancer. To our knowledge, there have been no reports of GGS endophthalmitis associated with metastatic ovarian cancer. Because of the substantial morbidity and mortality associated with GGS infections, it is becomingly increasingly important to delineate the true burden of infection from GGS and its various clinical manifestations. We suspect that this patient with metastatic ovarian carcinoma was more susceptible to infection and developed bacteremia and bilateral endophthalmitis, eventually resulting in total loss of vision.

Resistance of Group A streptococci to macrolides has developed as a result of widespread use of macrolides for treatment of respiratory, cutaneous and other infections.¹⁰ Group B streptococci are relatively more resistant to penicillin than are Group A streptococci.¹³ Thus far, GGS has remained susceptible to penicillins, cephalosporins, vancomycin and macrolides.⁶ Because of the increasing use of antibiotics and the increased frequency of GGS infections, more rigorous screening for the development of the emergence of resistance of GGS to β -lactams, macrolides and other antimicrobial agents should be performed.

Learning points

- ▶ GGS is an uncommon cause of infection in immunocompetent individuals, and usually only causes severe infection in immunocompromised individuals, especially those with malignancy or diabetes mellitus.
- ▶ When GGS is isolated from the blood, it is important to identify a focus of infection (for example, an abscess, endocarditis, or a suppurative process in an unusual location), as the organism has the propensity to disseminate to distant sites.
- ▶ GGS infection is associated with significant morbidity and mortality.

Competing interests None.

Patient consent Obtained.

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