Streptococcus Dysgalactiae (Group C Streptococcus) Cutaneous Manifestations: A Case Report

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Abstract

Streptococcus Dysgalactiae, a group C streptococcus (GCS) has been mainly implicated as a pathogen associated with mucosal infections. This case corroborates the current emphasis toward Strep dysgalactiae as a pathogen of increasing suspicion when faced with variable clinical presentations.

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KEY CLINICAL MESSAGE

Streptococcus Dysgalactiae infections have serious clinical outcomes with high mortality rates. Our case emphasizes the importance of recognizing Group C streptococcus (GCS) as a pathogen associated with variable cutaneous manifestations.

Keywords

Streptococcus dysgalactiae , Group C *streptococcus* , myalgias, rash, bacteremia

INTRODUCTION

Streptococcus is a genus of gram positive bacteria that are classified based on characteristics including hemolytic effect on blood agar, Lancefield antigenic composition and susceptibility to various compounds. [1] *Streptococci* (strep) that demonstrate complete hemolysis on blood agar are referred to as β-hemolytic *streptococci* .[2] Of the β-hemolytic strep groups, those in groups A, B, C, D and G include important pathogens

that are associated with infectious processes involving human mucous membranes.[1] *Streptococcus dysgalactiae*is a group C strep species which has been identified as a commensal of skin, respiratory, gastrointestinal, and female genital tract.[3] Although once regarded as non-pathogenic,*Streptococcus dysgalactiae* has been increasingly isolated from both mild localized skin infections, and severe infections such as necrotizing fasciitis and osteomyelitis.[3] Currently in literature there are very few accounts of skin manifestations attributed to *Strep dysgalactiae* bacteremia.[4] This case report presents a patient with a rare finding of *Streptococcus dysgalactiae bacteremia* (Group C strep) associated with cutaneous and systemic manifestations. Informed consent was obtained from the patient.

CASE PRESENTATION

A 63-year-old Caucasian female with past medical history of osteoporosis on actonel and no prior hospitalizations, presented to the Emergency Department (ED) on January 25, 2020 with complaints of fever of 101.1 F, polyarthralgia, myalgia, and diffuse weakness. Patient admitted to performing an intense cross fit workout four days prior, leading to diffuse myalgias in upper and lower extremities associated with chills and shaking at night. This ED visit was preceded by a visit to urgent care, a day before for similar symptoms. Radiography of the right shoulder was negative for fracture. She was prescribed toradol for the diffuse myalgias and severe right shoulder pain. Since then the myalgias had worsened with additional finding of decreased urine output causing her to present to the ED. Associated symptoms included fever, chills, decreased activity, weakness, decreased urine output, and dark colored urine. She denied any prior instance of a similar episode. Patient also denied any recent trauma, travel, any new exposures, or any sick contacts. Patient is up to date on her vaccinations. Review of systems was negative for rhinorrhea, chest pain, shortness of breath, nausea, vomiting, abdominal pain, diarrhea, dysuria, swelling, numbness, and tingling. No pertinent family history of arthritis or skin disease. Patient is an elementary school teacher who participates in regimented workout routines and exercise bootcamps. Patient reported allergy to Penicillin. Vital signs were blood pressure of 99/55, heart rate of 89, respiratory rate of 18, and temperature of 101.1 F. Physical exam on admission revealed no rashes or skin lesions, muscle strength was 5/5 bilaterally in upper and lower extremities, sensation was intact peripherally, and cranial nerves were grossly intact. Positive findings included tenderness to palpation of the bilateral calves and upper extremities. Patient also noted right posterolateral shoulder pain radiating to the proximal arm, worse with overhead movement, abduction, and external rotation with adduction. Pertinent labs showed no leukocytosis. Hematocrit of 36.4% and mean corpuscular volume of 89 fl. AST and ALT were elevated at 163 and 186 respectively. Lactic acid was 1.6 mmol/L, C-reactive protein was elevated at 22.5 mg/L and ESR was 35. Elevated creatine kinase of 322 U/L. Normal magnesium of 1.7 mEq/L and phosphorus of 2.2 mg/dL. Urine analysis (UA) showed pyuria of 12 white blood cells with moderate blood. UA was negative for glucose, bilirubin, ketones and nitrates. Chest radiograph showed no acute disease. X-ray of the right shoulder showed mild degenerative changes of glenohumeral joint. Transesophageal echocardiography was negative for vegetations, electrocardiogram showed sinus tachycardia, and magnetic resonance imaging showed no evidence of osteomyelitis. Tests for lyme disease, and*Influenza A&B* showed negative findings. Blood culture showed growth of gram-positive bacteremia in chains, later found to be*Group C Streptococcus* .

The patient was admitted to inpatient services with a diagnosis of sepsis secondary to gram positive bacteremia. On the day of admission, her sequential organ failure assessment (SOFA) score was 3 with thrombocytopenia and hyperbilirubinemia. On day 2 of hospitalization, infectious disease favored the diagnosis of Right arm and forearm cellulitis with gram positive bacteremia. Clinical exam showed edema, erythema, and significant warmth in her right upper extremity. Tenderness to palpation was also noted to the right lower extremity below the knee. On day 3 of hospitalization, the general floor nurse noted expansion of rash with a new cutaneous finding on the left arm and left lower leg. Patient denied any pruritus of the new rash. Physical exam revealed oval shaped macular rashes throughout arms and legs bilaterally with warmth and tenderness to palpation (**Figure 1**). Decreased active and passive range of motion was also noted bilaterally. Patient was admitted to the intensive care unit (ICU) with concern of necrotizing fasciitis. Further imaging revealed no emphysema tracking up fascial planes or rim enhancing abscess and no crepitation on palpation made necrotizing fasciitis unlikely.

The provisional diagnosis was Group C *streptococcus* bacteremia associated with diffuse myalgias and cutaneous manifestations. Treatment was initiated with vancomycin, flagyl and cefepime which was switched to doxycycline and ceftriaxone due to suspicion for lyme disease and positive growth for gram positive cocci in chains. With this course of antibiotics patient's clinical symptoms began to improve. Six days later the rash started regressing and the patient reported subjective relief of pain. On the day of discharge, the patient was afebrile and reported almost complete resolution of pain and rash. No leukocytosis was found, and repeat cultures were negative for growth. Transmitinits also resolved. Patient was discharged from the hospital in stable, improved condition. Patient was switched to oral ceftin to complete the antibiotic course.

DIFFERENTIAL DIAGNOSIS AND TREATMENT

Group C *streptococcus* bacteremia with cutaneous manifestations can be misdiagnosed with necrotizing fasciitis, toxic shock syndrome, contact dermatitis, and drug eruption. Computerized tomography scan of the upper and lower extremities revealed no subcutaneous air tracking in fascial planes which would normally be seen in necrotizing fasciitis. Clinical exam finding of no crepitation with palpation on the right upper extremity was also a negative finding for necrotizing fasciitis. Toxic shock syndrome (TSS) was also ruled out due to lack of hemodynamic instability and other associated systemic findings. Negative blood cultures for the most common pathogen of TSS and lack of risk factors supported the decision. Contact dermatitis was able to be excluded via history taking in which the patient denied any changes in soaps, detergents, clothing, and denial of any other potential toxic contact. Finally, thorough reconciliation of medication list as well as denial of any medical changes ruled out any drug associated eruption. The diagnosis was confirmed with blood cultures done twice which were positive for GCS species.

Treatment of GCS bacteremia is similar to other streptococci infections. Generally, Group C strep is sensitive to Beta-lactam antibiotics such as penicillin or cephalosporins.[4] Treatment of severe bacteremia can be accomplished with large dose penicillin G (3,000,000 units) every four hours or third generation cephalosporins.[4] Treatment duration should last till about three or four days after the resolution of fever or clinical signs of infection. For individuals with significant allergies to beta-lactam antibiotics, linezolid or vancomycin can be effective.[4] While treating for infection, supportive care for symptoms should also be provided. Hydration should be maintained with IV normal saline infusion. Pain and fever should be managed with appropriate analgesics and antipyretics. Upon discharge, this patient was advised to complete the antibiotic course of oral ceftin.

DISCUSSION

As described previously, cutaneous manifestations of Group C*streptococcus* (GCS) are fairly uncommon in the clinical setting, however not unheard of. GCS bacteremia that are associated with cutaneous eruptions have been described in past literature.[5,8] GCS in and of itself as an isolated finding on blood culture, is fairly rare and generally encountered in individuals with comorbidities such as immunosuppression or malignancy. In the context of an otherwise healthy female patient, the incidence of cutaneous lesions of Group C bacteremia are exceedingly rare.*Strep dysgalactiae* is a member of the group C Strep family. It is a gram-positive coccus that is in a chain configuration and beta hemolytic.[3] *Strep dysgalactiae* is a commensal bacteria that is found mostly in the alimentary tract or genital tract, but can occasionally be found on skin as a component of the skin flora. Initially, this group of strep was thought to be non-pathogenic in humans, however, recent findings have shown that some skin and tonsillar infections are a result of *Strep dysgalactiae*colonization.[3] It is postulated that *strep dysgalactiae* can be responsible for some cellulitis cases.[4,7] Aside from local cellulitis or erysipelas, other cutaneous manifestations can be seen in the context of a systemic bacteremia.[4] In literature, rare cases of *Strep dysgalactiae* bacteremia can present with a diffuse papular rash that can expand to the trunk and extremities. Cases of necrotizing fasciitis are also attributed to *Strep dysgalactiae* . This case report presents a patient with *Strep dysgalactiae* bacteremia associated with tender macular exanthem on bilaterally upper and lower extremities and trunk, myalgias and weakness. This is a fairly rare presentation of GCS bacteremia than what is often seen clinically. Generally, Group C strep bacteremia presents as a profound sepsis or meningitis with resultant positive blood cultures. [6] In this case, the patient had no findings significant for meningitis. The patient presented with significant systemic findings of fever,

myalgia, arthralgia, elevated LFTs, sepsis and thrombocytopenia with diffusely tender exanthem. There are very few case presentations on Group C strep bacteremia with diffuse myalgias and associated cutaneous manifestations. The resolution of the rash and pain with antibiotics therapy and negative re-growth of *Strep dysgalactiae* on blood culture indicated an infectious process, thus supporting our rare case presentation. In addition to the atypical presentation of Group C strep which is very sparsely described in literature, our patient's dermatological findings were also distinct from the prior accounts of*Strep dysgalactiae* associated cutaneous lesions. This case corroborates the current emphasis toward *Strep dysgalactiae* as a pathogen of increasing suspicion when faced with variable clinical presentations.

CONCLUSION

Streptococcus dysgalactiae , a Group C Streptococcus is an important human pathogen that can manifest in a variety of diseases such as cellulitis, meningitis, bacteremia, and endocarditis. Current literature shows an increased likelihood of *Strep dysgalactiae*bacteremia in immunocompromised patients with comorbidities. There are numerous case presentations on *Strep dysgalactiae* , but they are insufficient in regard to cutaneous manifestations of this gram-positive bacteria. Our case describes a rare presentation as the patient was a healthy female without underlying health issues. This case details the presentation and clinical course of sepsis secondary to*Streptococcus dysgalactiae* bacteremia associated with diffuse myalgias and cutaneous manifestations. The patient's diffusely tender, non-pruritic macular exanthem contrasts prior accounts in which pruritic lesions were associated with GCS bacteremia. The dissipation of the patient's rash and other symptoms with antibiotic treatment identifies*Strep dysgalactiae* as a likely etiology and supports that variable cutaneous manifestations can occur.

AUTHORSHIP

AG: organized this case report; performed literature review and wrote the first and final manuscript draft. SG, AV, and EM: performed literature review and contributed to the contents of this manuscript. RL: provided feedback on and critique of the manuscript.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

CONSENT

Patient provided written consent for publication of this case report. It is available upon request.

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Not applicable

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IMAGES

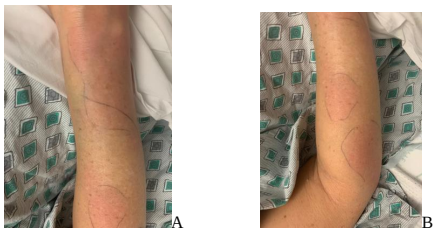

Figure 1. Cutaneous eruptions associated with *Streptococcus dysgalactiae* bacteremia. **A,** Erythematous and tender plaque on the right forearm. **B,** Erythematous and tender plaque on the left forearm