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Case Report

Fatal, non-menstrual staphylococcal toxic shock syndrome associated with dental implant

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ABSTRACT

Background: Staphylococcal toxic shock syndrome (TSS) is a life-threatening disease that characterized by rapid onset of fever, rash, hypotension, and multi-organ failure.
Case Report: A 58-year-old man presented to the emergency department (ED) with complaints of fatigue, myalgia, and blurred vision which had progressed over 48 hours. His medical history included hypertension and dental implant treatment that lasted 15 days. Despite aggressive medical treatment, which included multiple vasopressors, continuous renal replacement therapy in combination with CytoSorb® and broad-spectrum antibiotics, he died 16 hours after admission to the intensive care unit. *Staphylococcus aureus* was detected in his blood and ETA cultures after the patient's death.
Conclusion: Staphylococcal TSS is classified as menstrual and non-menstrual. Non-menstrual TSS cases have been documented with increasing frequency in the literature. We present a case of Staphylococcal TSS in a 58-year-old male patient who had a dental surgery history. Our patient died within a few hours after admission to the ICU with signs of multi-organ failure. We wanted to draw attention to this issue by presenting our patient.

1. Introduction

Toxic shock syndrome (TSS) is an acute, life-threatening clinical condition. It is characterized by fever, hypotension and multi-organ failure. TSS is a potentially deadly disease requiring prompt diagnosis and treatment.[1,2] The most common etiologic agents are *Staphylococcus aureus* and *Streptococcus pyogenes*.

TSS associated with *Staphylococcus aureus* is primarily a disease of young menstruating women. TSS is also described in men, non-menstruating women and even children. Non-menstrual toxic shock syndrome has been associated with surgical incisions, burns, parturition, cutaneous and subcutaneous lesions of many sites.[3] There are few publications reporting TSS developing after dental interventions.[3,4]

We report a rare case of non-menstrual TSS in a 58-year-old male patient who had a dental surgery history. Our patient died within a few hours after admission to the ICU with signs of multi-organ failure.

2. Case Report

A 58-year-old man presented to an emergency room with complaints of fatigue, myalgia, and blurred vision which had progressed over 48 hours. He presented with a fever and swelling, edema and hyperemia in the bilateral eyelids, especially on the right eye. His medical history included hypertension and dental implant treatment that lasted 15 days.

On physical examination, the patient was conscious but had hypotension (86/56 mm Hg), tachycardia (118

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beats/minute), and SpO_2 in room air during spontaneous breathing was 98%.

Laboratory data revealed abnormal results; he had neutrophilic leukocytosis (white blood cells were 17,700/mm^3 with 95.5% neutrophils, 2.4% lymphocytes and 1.8% monocytes). The results of liver and renal function tests were abnormal (AST 325 U/l, ALT 167 U/l, LDH 725 U/l, urine 89 mg/dl, creatine 2.2 mg/dl). The serum level of CK 10811 U/l, CK-MB 152 U/l, CRP 343 mg/l, prokalsitonin >75 ng/ml and covid PCR was negative. The serum electrolyte concentrations were normal.

Imaging was done in the emergency room. While there was no obvious pathology in brain CT, diffusion MRI and abdominal CT, thorax CT showed pleural effusion in the right hemithorax and multiple nodular images with irregular boundaries.

The patient was admitted to the intensive care unit. Initial treatment included supplemental oxygen, intravenous fluids, and antibacterial therapy with vancomycin and piperacillin–tazobactam. On admission, blood, urine and ETA cultures were taken. During the next few hours, the patient had respiratory distress and hypotension requiring mechanical ventilation and vasopressor support. Lumbar puncture could not be performed on the patient because of unstable vital signs.

Dopamine infusion was added to the patient whose hypotension deepened. In arterial blood gas, pH <7.1, HCO_3: 13.1, BE: –15, bicarbonate infusion was given. Urine output decreased markedly, and concentrations of hepatic enzymes, bilirubin, CK, CK-MB and creatinine levels increased. Continuous renal replacement therapy in combination with CytoSorb® were applied.

The patient, who did not respond to treatment, had cardiac arrest 16 hours after admission to the intensive care unit. CPR was performed, but no response was received and the patient died. Methicillin-resistant *Staphylococcus aureus* was grown in the right and left blood cultures and ETA results after the patient's death.

3. Discussion

Toxic shock syndrome; It is an acute infection caused by staphylococcal exotoxin that causes generalized erythema, hypotension, high fever, dysfunction and failure in multiple systems.[5]

Our patient full filled the criteria of TSS. He had fever, severe hypotension and multisystem organ failure that muscular, renal and hepatic.

The original description of Todd et al. in 1978 was of an infectious syndrome in seven children aged 8 to 17 years, with the common clinical features of high fever, profound and refractory hypotension, profuse diarrhea, erythroderma, mental confusion and renal failure.[1] It is a super-antigen mediated disease caused by the exotoxins produced by a particular strain of *S. aureus*.

The management of the disease requires removal of any focus of infection, elimination of the infecting bacteria by antimicrobial medication, and aggressive support of the circulation and multi-organ failure.[5] We applied mechanical ventilation, inotropic agent, continuous renal replacement therapy (CCRT) and CytoSorb® filter to our patient.[6]

The patient died within a few hours of admission to the ICU with signs of multi-organ failure, despite all therapeutic efforts. In post-mortem, Staphylococcus aureus was detected in his blood and endotracheal aspirate cultures. There are a limited number of cases in which fatal non-menstrual TSS have been reported.[7,8]

4. Conclusion

We wanted to draw attention to this issue by presenting our male patient with fatal staphylococcal toxic shock syndrome. History should be questioned in detail in patients presenting with fever, rash, myalgia, organ failure and rapid clinical deterioration.

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6. Conflicts of Interests

The authors declared no conflict of interest.

7. Acknowledgment

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