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## Communications

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# The Toxic Shock Syndrome: A Case Report

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The toxic shock syndrome (TSS) is a recently described disease process that primarily affects young women.<sup>1</sup> The purpose of this communication is to alert primary care physicians to this potentially life threatening condition by describing a case seen in a family practice setting.

### Case Report

A 32-year-old white female who was previously in good health developed fever, vomiting, and diarrhea 30 hours prior to admission. The vomiting soon subsided but the fever and diarrhea persisted with the development of headache, sore throat, and weakness. Oral intake of fluids remained good. She had taken no drugs and had had no recent exposure to animal vectors or human illness. She was having a normal menstrual period at the time. An intrauterine device (IUD) had been in place for two years.

On presentation to the Family Medical Care Center in Columbia, Missouri, she was extremely weak and lethargic. Blood pressure was 70/40 mmHg, heart rate was 140 beats per minute, and temperature was 39.7 C. Noteworthy physical

findings included bilateral conjunctival injection, pharyngeal erythema, mobile neck, clear lung fields, normal heart sounds, and benign abdomen. The uterus was mildly tender and a purulent appearing discharge was present in the cervical os. Urinalysis showed +1 proteinuria, and 5 to 10 white blood cells per high powered field with a negative pregnancy test. White blood cell count was 16,000 with 5 metamyelocytes, 56 bands, 38 neutrophils, and 1 lymphocyte per 100 cells. Hematocrit value was 42 percent and platelet count was 151,000. Hyponatremia, hypokalemia, hypocalcemia, hypophosphotemia, and hypomagnesemia were present. Blood-urea nitrogen (BUN) was 43 with a normal creatinine. SGOT and SGPT were elevated to approximately three times the normal ranges. Total bilirubin was slightly increased with a normal alkaline phosphatase. Fibrin split products were present. Prothrombin time, partial thromboplastin time, and fibrinogen level were normal. A chest x-ray film was normal. Blood, urine, stool, and cerebrospinal fluid cultures were negative. A culture of the uterine cervix grew coagulase-positive *Staphylococcus aureus* sensitive to gentamicin and clindamycin.

In the intensive care unit, she was treated for presumptive septic shock with intravenous fluids, dopamine, hydrocortisone, penicillin, gentamicin, and clindamycin. Her IUD was removed and the

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endometrium was biopsied. Rapid improvement occurred with defervescence and normalization of blood pressure in 24 hours. Serum electrolytes, BUN, and white blood cell count returned to normal within four days. Platelet count reached a nadir of 117,000 on the third day and rose to 550,000 at the time of discharge on the eighth day. Two to three weeks after the onset of the illness she noted desquamation of her palms and soles. She has been in good health during a 24-month follow-up period.

## Discussion

This patient's illness had many of the features of the toxic shock syndrome.<sup>1,2</sup> A large majority of the 55 cases of this condition reported to the Center for Disease Control (CDC) in Atlanta, Georgia, involved previously healthy females in the reproductive age range. Onset of the illness during menstruation was frequent. Early symptoms consisted of fever, vomiting, diarrhea, myalgia, headache, sore throat, and weakness with progression to circulatory collapse within 24 to 48 hours. Conjunctival and pharyngeal injection and an erythematous maculopapular rash with subsequent desquamation were frequent physical findings. Abnormal laboratory values included leukocytosis with a left shift, thrombocytopenia with some evidence of disseminated intravascular coagulation, azotemia, hyperbilirubinemia, and increased transaminases.

In this case the absence of a rash during the acute illness was an atypical feature. However, desquamation involving the hands and feet, two to three weeks following the onset of the illness, occurred, suggesting skin involvement.

In addition to the hematologic, renal, and hepatic abnormalities, the following metabolic derangements were evident in this case: hyponatremia, hypokalemia, hypocalcemia, hypophosphatemia, and hypomagnesemia. While vomiting and diarrhea may have contributed to these deficiencies, the magnitude of fluid loss estimated by history seemed insufficient to account for the extent of electrolyte depletion. Similar electrolyte derangements occur in infectious diseases such as Rocky Mountain spotted fever<sup>3</sup> and Legionnaires' disease.<sup>4</sup> Further investigation of toxic shock syndrome will determine whether the abnormalities noted in this case were idiosyncratic or are characteristic of the condition. These electrolyte disturb-

ances may reflect direct toxic metabolic effects.

While the etiology of toxic shock syndrome is not firmly established, there is considerable evidence that *Staphylococcus aureus* is involved in the pathogenesis. This organism was detected in either the throat, vagina, cervix, or rectum in 73 percent of the cases reported to the Center for Disease Control.<sup>1</sup> The prevalence of staphylococcal isolation from the cervixes of healthy menstruating women attending a family planning clinic was seven percent.<sup>5</sup>

All seven patients reported by Todd and Fishaut had phage group I *Staphylococcus* cultured from either a site of localized infection (abscess of buttock, empyema) or mucosal surfaces, but not from blood, cerebrospinal fluid, or urine.<sup>2</sup> These staphylococci elaborated a unique toxin that produced an epidermal reaction in mice. There is current speculation that a circulating toxin derived from localized and in some cases subclinical staphylococcal infection is involved in the pathogenesis of the condition.<sup>2</sup> Thus, the isolation of *Staphylococcus aureus* from the cervix of this patient is highly significant.

Analysis of additional cases of toxic shock syndrome reported to the Center for Disease Control in the spring of 1980 indicated that the use of vaginal tampons was associated with the development of the toxic shock syndrome in menstruating women.<sup>6</sup> More recently, results of a case control study have implicated a specific brand of tampon (Rely) in this association.<sup>5</sup> To date there is no evidence that the toxic shock syndrome is associated with a particular form of contraception.

Clinically, the toxic shock syndrome resembles other conditions from which differentiation may at times be difficult. Infectious diseases with which the syndrome may be confused include Rocky Mountain spotted fever, leptospirosis, meningococcemia, scarlet fever, gram-negative sepsis, septic abortion, salmonellosis, rubeola, and other febrile viral exanthems. Collagen vascular disorders, acute adrenal insufficiency, thyroid storm, Stevens-Johnson syndrome, and drug reactions are noninfectious conditions that could present in a way similar to this syndrome.

Because of considerable overlap of clinical manifestations between the toxic shock syndrome and the mucocutaneous lymph node syndrome, there is speculation that the conditions may be related.<sup>2</sup> Three recently reported cases of adult

mucocutaneous lymph node syndrome demonstrated many characteristics of the toxic shock syndrome.<sup>7</sup>

Management of a seriously ill young woman whose presentation suggests the toxic shock syndrome should usually consist of multiple antibiotics that afford a broad spectrum of coverage, and fluids and vasoactive agents to maintain adequate blood pressure and perfusion of vital tissue. In this setting, anti-staphylococcal antibiotic coverage is important although the specific role and value of anti-microbial therapy in this syndrome remains to be determined. In addition to blood, urine, and cerebrospinal fluid, mucosal surfaces such as pharynx, cervix, vagina, and rectum should be cultured to assist with later decision making regarding antibiotic treatment.

While the toxic shock syndrome appears to be a new disease, it may not be rare. Cases have probably been misdiagnosed and it is likely that a spec-

trum of clinical severity exists. Increasing recognition of the condition will help delineate and clarify the clinical picture and hopefully will illuminate effective preventive and therapeutic approaches. Primary care physicians need to be aware of this syndrome, its nonspecific early manifestations, and its potential for rapid progression to a life threatening state.

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## Patient Attitudes Toward Physician Inquiry About Will Status

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Physicians become closely involved with the patient and family at the time of a death, whether anticipated or sudden. Subsequently, the physician counsels family members to help relieve the suffering of the grieving process. Perhaps one way the physician can aid the family is to help assure that patients have completed and signed a legal will before death.

Although physicians are one professional group in this society which could appropriately inquire into an individual's will status, a search of *Index Medicus* revealed no published studies concerning patient attitudes towards such inquiry. A study was designed to survey patient attitudes toward physicians inquiring concerning wills and to de-

termine what percentage of patients did or did not have wills.

#### Methods

The study population was composed of patients at the Family Practice Center at Bowman Gray School of Medicine, a residency training model family practice center staffed by 27 residents and 9 physician faculty members. At the time of the study, the family practice center had 6,500 registered patients whose demographic characteristics approximated those of Forsyth County, North Carolina.

A questionnaire was developed to elicit demographic data and to ask two questions: (1) How would you feel if your family doctor routinely asked if you have a will during annual physical examination? and (2) Do you have a will?

Three hundred four adult patients (over 18

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