

Clostridium sordellii Infection of Female Genital Tract: A Rare but Fulminating Reaction

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ABSTRACT

Clostridium sordellii, an anaerobic pathogen, is ubiquitously distributed in the environment and causes fatal necrotizing infections in approximately 70% of all reported cases.

Characteristic clinical features include absence of fever and rash, dramatic leukemoid reaction (LR), capillary leak and fluid sequestration with hemoconcentration, refractory tachycardia and hypotension, and marked edema of infected tissues without gas production or extensive myonecrosis. *C. sordellii* has rarely been identified in the genital tract, other *Clostridium* species colonize the vagina in 4 to 18% of healthy women and commonly are associated with postpartum endometritis and septic abortion. Pregnancy, childbirth, or abortion may predispose some women to acquire *C. sordellii* in the vaginal tract. Dilatation of the cervix may lead to ascending infection of necrotic decidual tissue. The acidic pH of the vaginal tract may enhance the cytopathic effects of *C. sordellii* lethal toxin. *C. sordellii* infections pose difficult clinical challenges and are usually fatal.

Keywords: *Clostridium sordellii*, Leukemoid reaction, Toxic shock syndrome.

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INTRODUCTION

Since its first report in 1922, only a few cases of bacteremia due to *Clostridium sordellii* have been reported.¹ In the world literature, only very few cases of a toxic shock syndrome due to *C. sordellii* necrotizing infections have

been reported till now. It has rarely been implicated as a human pathogen. It is a normal inhabitant of intestinal flora of both humans and animals.² *Clostridium sordellii* have been isolated in vaginal secretions of 5 to 10% of nonpregnant women. During labor or abortion open cervix permits the passage of vaginal pathogens which appears to be the critical event that leads to infection of the endometrium. Infection occurs almost exclusively in association with infection of the uterus or the perineum after either infected episiotomy or postpartum endometritis.³

Serious infection can occur after trauma, medically induced abortion, childbirth, spontaneous abortion, and surgical abortion and injection drug use.

Clinical presentation includes sudden onset influenza like prodrome, progressive refractory hypotension, hypothermia or absence of fever and absence of purulent discharge. Distinctive pathological findings include significant local edema with pleural and peritoneal effusion, localized tissue necrosis and thrombosis of nearby vessels. *C. sordellii* produce several exotoxins that lead to progressive edema and shock.

Clostridium sordellii is associated with a profound exotoxin mediated systemic response characterized by anasarca, refractory hypotension and marked leukocytosis.

DIAGNOSIS

Clostridium sordellii is confounded by early, nonspecific signs and symptoms and by the absence of fever. Diagnosis is often delayed because there is no rapid diagnostic test for the pathogen.⁴

Diagnosis of *C. sordellii* toxic shock syndrome (TSS) should be suspected when previously healthy women with recent 'clean' obstetric wound present with rapidly spreading edema with cardiovascular decompensation with progressive refractory shock. Definitive diagnosis requires isolation of *C. sordellii* from infected tissue as blood culture is usually negative. Aldape et al have described 45 cases, eight (18%) were associated with normal childbirth, five (11%) were associated with medically induced abortion, and two (0.4%) were associated with spontaneous abortion. The case-fatality rate was 100%. Ten (22%) of the *C. sordellii* infections occurred in injection drug users. Other cases of *C. sordellii* infection [in 19 patients (43%)] occurred after trauma or surgery.

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Overall, the mortality rate was 69%. Eighty-five percent of all patients with fatal cases died within 2 to 6 days of initial infection, and nearly 80% of fatal cases developed leukemoid reaction (LR).

Clostridium sordellii neuraminidase stimulates proliferation of promyelocytic HL-60 cells. It also modifies vascular cell adhesion molecule 1, which orchestrates the release of mature and immature granulocytes from bone marrow stromal cells. Thus, neuraminidase likely plays an important role in the characteristic LR in *C. sordellii* infection.⁵ McGregor et al⁶ Rorbye C,⁷ Bitti A et al⁸ have reported a case of postpartum death due to *C. sordellii* TSS. Fisher et al,⁹ Cohen Al et al¹⁰ have reported a fatal case after abortion with mifepristone and misoprostol. Sosolik¹¹ et al have reported a case of primipara developing an episiotomy infection which progressed to involve the underlying fascia and muscle. Despite early and adequate debridement of the devitalized tissue, she developed anasarca, marked leukocytosis, refractory hypotension, hypothermia, and a persistent coagulopathy, and expired on postpartum day 5. The cultures from the excised tissue grew *C. sordellii* all blood cultures were negative.

DISCUSSION

Patients with a *C. sordellii* characteristically develop a profound systemic capillary leak, refractory hypotension, and a marked LR where circulating white blood cell (WBC) counts often exceed 100,000/l.

The fastidious anaerobic growth, variable staining characteristics, and complex biochemical profiles of *Clostridium* species make them difficult to isolate. Additional cases of *C. sordellii* infection of the genital tract in which the organism was not cultured, speciated, or reported probably exist. Evidence of *C. sordellii* infection can be established with the use of anti-*Clostridium* species immunohistochemical assay and both organism-specific and broad-range PCR assays performed on fixed uterine tissue. Anaerobic culture techniques or new diagnostic approaches are needed to define the true burden of *C. sordellii* in gynecologic infections. Limited data is available regarding optimum therapy for *C. sordellii*. Aggressive surgical wound débridement, removal of infected organs (e.g. by means of hysterectomy), and antibacterial agents are first steps to decrease the bacterial load and further production of toxins.

In vitro susceptibility testing on *C. sordellii* strains showed low minimal inhibitory concentrations for penicillin, ampicillin, erythromycin, rifampin, tetracycline, cefoxitin, clindamycin and metronidazole. However, débridement, surgery, and antibacterial therapy will not mitigate the effects of preformed toxin.

There are no clinical data on the use of immunoglobulin or antilethal toxin antibodies for treatment of *C. sordellii* infections.

Strong suspicion should be made if peripartum female presents with toxic shock syndrome with refractory shock, edema, ascitis, pleural effusion without fever or pain.

CONCLUSION

For *C. sordellii* TSS, early recognition of condition may be life saving as this infection has higher mortality and fatal outcome with delayed treatment or unrecognition of condition. The true burden of *C. sordellii* in gynecologic infections is not known. New diagnostic approaches are needed as they pose a difficult clinical challenge. Limited data is available regarding optimum therapy for *C. sordellii*. Improved treatments are needed to reduce the morbidity and mortality of these infections as these infections are usually fatal.

REFERENCES

1. Matten J, Buechner V, Schwarz R. A rare case of *Clostridium sordellei* bacteremia in an immunocompromised patient. *Infection* 2009 Aug;37(4):368-369.
2. Spera RV Jr. Case report and review. Kaplan MH, Allan SL. *Clostridium sordellei* bacteremia *Clin Infect Dis* 1992;15: 950-954.
3. Sinave C, Le Templier G, Blouin D, Leveille F, Deland E. TTS due to *Clostridium sordellei*: A dramatic postpartum & post-abortion disease. *Clin Infect Dis* 2002 Dec 1;35(11):1441-1443.
4. Aldape MJ, Bryant AE, Stevens DL. *Clostridium sordellei* infection: epidemiology, clinical findings, and current perspectives on diagnosis and treatment'. *Clin Infect Dis* 2006 Dec 1;43(11):1436-1446.
5. Aldape MJ. The leukemoid reaction in *Clostridium sordellei* infection: neuraminidase induction of promyelocytic cell proliferation. *J Infect Dis* 2007 Jun 15;195(12):1838-1845.
6. McGregor JA, Soper DE. Maternal deaths associated with *Clostridium sordellei* infection. *Am J Obstet Gynecol* 1989 Oct;16(4):987-995.
7. Rorbye C, Petersen IS, Nilas L. Postpartum *Clostridium sordellei* infection associated with fatal toxic shock syndrome. *Acta Obstet Gynecol Scand* 2000 Dec;79(12):1134-1135.
8. Bitti A, Mastrantonio P, Spigaglia P, Urru G, Spano AI, Moretti G, Cherchi GB. A fetal Postpartum *Clostridium Sordellei*: associated toxic shock syndrome. *J Clin Pathol* 1997 Mar;50(3):259-260.
9. Fischer M, Bhatnagar J, Guarner J. Sarah reagan fatal toxic shock syndrome Associated with *Clostridium sordellei* after Medical Abortion. *N Engl J Med* 2005 Dec 1;353:2352-2360.
10. Cohen AL, Bhatnagar J, Reagan S, Zane SB, D'Angeli MA, Fischer M, et al. Toxic shock associated with *Clostridium sordellei* and *Clostridium perfringens* after medical and spontaneous abortion. *Obstet Gynecol* 2007 Nov;110(5): 1027-1033.
11. Sosolik RC, Savage BA, Vaccarello L. *Clostridium sordellei* toxic shock syndrome: a case report and review of the literature. *Infect Dis Obstet Gynecol* 1996;4(1):31-35.