Internal Medicine
The Japanese Society of Internal Medicine
doi: 10.2169/internalmedicine.8552-16
Intern Med 56: 2523-2527, 2017
http://internmed.jp

【 CASE REPORT 】

Group A Streptococcal Peritonitis and Toxic Shock Syndrome in a Postmenopausal Woman

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Abstract:
We herein report the case of a 66-year-old woman presenting with symptoms of gastroenteritis. Computed tomography showed small-bowel dilation without ischemic signs. After admission, she went into shock and was treated for sepsis of unknown origin. She was later diagnosed with group A streptococcal peritonitis due to an ascending vaginal infection. This case highlights the importance of considering Group A *Streptococcus* (GAS) infection as a cause of peritonitis in postmenopausal women.

Key words: Group A *Streptococcus*, streptococcal toxic shock syndrome, primary peritonitis

(Intern Med 56: 2523-2527, 2017)
(DOI: 10.2169/internalmedicine.8552-16)

Introduction

Although Group A *Streptococcus* (GAS) infections of the female reproductive tract are occasionally seen in premenopausal women, cases in postmenopausal women are rare. We describe a case of GAS peritonitis in a previously healthy postmenopausal woman to raise awareness about this potentially fatal condition.

Case Report

A 66-year-old woman presented to our emergency department with abdominal pain, vomiting, and watery diarrhea of 2 days in duration. Two days prior to her admission to our hospital, she visited her community gynecologist after experiencing clear vaginal discharge of 3 days in duration. She underwent a gynecological examination, including a Pap smear and vaginal swab for culture. She had no invasive procedures such as biopsy. The patient noted that the pelvic examination that was performed by the community gynecologist was rather more painful than usual.

The patient had no significant medical history other than an appendectomy at 55 years of age. She had undergone treatment for dental cavities a few weeks prior to her admission. She was not on any medication. She did not report a history of using tobacco, alcohol, or illicit drugs. She was a nurse and worked at a community clinic once a week. She had no symptoms of upper respiratory infection and had not been exposed to patients with such symptoms. The patient had no history of sexually transmitted diseases and had been abstinent from sexual intercourse for 10 years.

On admission, the patient was alert and fully oriented, but was clearly in distress. A physical examination revealed the following findings: systolic blood pressure, 89 mmHg; pulse, 93 beats/min; respiratory rate, 30 breaths/min; and body temperature, 38.8℃. Her abdomen was soft and seemed to show signs of intermittent guarding. She also showed a translucent vaginal discharge.

The laboratory data showed leukocytosis (9,400/μL), elevated C-reactive protein (15.2 mg/dL) and creatinine (1.69 mg/dL; normal range, 0.46-0.79 mg/dL), and metabolic acidosis (pH 7.29, pCO_2 39.8 mmHg, HCO_3 18.5 mEq/L). Her liver function test results were within the normal ranges. Computed tomography (CT) showed small-bowel dilation without ischemic signs, and mild ascites in the pelvis. The patient's uterus seemed large for a postmenopausal woman and showed irregular enhancement, but this was not deemed to be significant at the time (Figure).

She was admitted for close monitoring with a diagnosis of enteritis of unknown origin. We initially infused her with large amounts of intravenous fluids. Eight hours after admission, her condition showed rapid deterioration, and she developed septic shock with disseminated intravascular coagu-

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Received: November 13, 2016; Accepted: February 8, 2017; Advance Publication by J-STAGE: August 21, 2017
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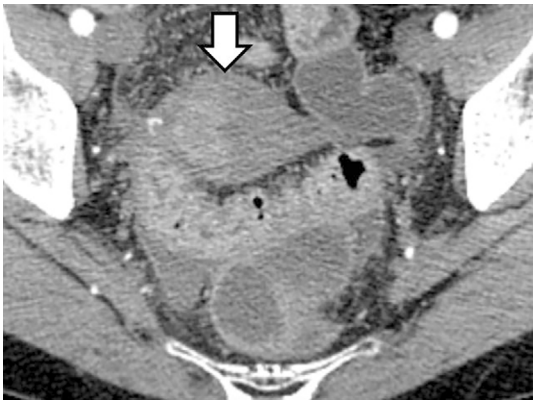

Figure. Computed tomographic scan of the pelvis showing irregularly enhanced uterus (white arrow).

lation [systemic inflammatory response syndrome (SIRS) score 3, 0.18γ noradrenaline required to maintain mean arterial pressure >65 mmHg, lactate 2.34 mmol/l, platelet 116,000/μL, prothrombin time-international normalized ratio (PT-INR) 1.7, fibrinogen degradation products (FDP) 46 μg/mL]. As peritoneal infection following a vaginal procedure was suspected, intravenous meropenem (2 g/day) was initiated, along with thrombomodulin.

Based on the suspicion of an ascending infection from the genital tract and the observation of uterine enlargement on CT, the gynecology department was consulted. As the patient was in a critical condition, antibiotic treatment was initiated before the gynecological examination. A pelvic examination revealed normal leucorrhea with mild cervical motion tenderness. Pelvic inflammatory disease was thought to be unlikely as there was dissociation between the severity of the findings from the pelvic examination and her overall status. Some white blood cells were seen on Gram staining of the vaginal discharge, but there were no signs of bacteria or fungi.

On the 2nd day of hospitalization, the blood cultures taken on admission grew Gram-positive *Streptococci*. Cardiologists were consulted to rule out infectious endocarditis, but transthoracic echocardiography showed no vegetation. Repeat CT showed uterine enlargement, cervical wall thickening, and a pelvic abscess, strongly suggesting an ascending infection from the vagina.

By the 3rd day of hospitalization, the patient's condition slowly began to improve. The blood cultures grew GAS, and the vaginal swab taken at the community gynecologist 2 days before admission was also reported to grow GAS. The vaginal culture taken after admission remained negative. M-typing of the isolates was not performed. No other organisms were isolated. She was diagnosed with primary GAS peritonitis caused by ascending infection from the vagina. As the formation of the pelvic abscess suggested a polymicrobial infection, ampicillin/sulbactam (12 g/day) and clindamycin (1,800 mg/day) were administered. Intravenous antibiotics were continued for 16 days until the pelvic abscess decreased in size on a follow-up CT examination. The patient eventually made a complete clinical recovery and was discharged on oral antibiotics. The antibiotics were continued until the complete resolution of the pelvic abscess was confirmed on follow-up.

Discussion

Although GAS is not considered to be a part of the normal flora of the female genital tract, we found 86 cases (65 reports) of primary peritonitis caused by GAS (1-65), most of which were in women (female:male ratio approximately 7:1), suggesting an ascending genital route of infection. GAS peritonitis has been reported to occur in premenopausal women, mostly in association with procedures such as intrauterine device (IUD) insertion (14, 24, 64).

Streptococcal infection in a postmenopausal woman in the absence of any precipitating factor is rare. It is suggested that physiologically, the cervical mucus of postmenopausal women is more tenacious and serves as a mechanical barrier to ascending infections (66). Decreased sexual activity, the likelihood of high-risk procedures such as abortions as well as the use of IUDs may be the reason that primary peritonitis is rare in postmenopausal women. However, this would also mean that postmenopausal women that are sexually active or who have transvaginal procedures are at risk of primary GAS peritonitis. It is not possible to say whether the Pap smear played a role in the development of peritonitis in the present case, as the procedure is generally considered to be noninvasive. Considering that our patient had an increase in vaginal discharge before the gynecological examination, we believe that the patient would have developed peritonitis regardless of the procedure. If the Pap smear were the cause of the patient's peritonitis, this would be the first reported case.

As most reports did not clearly state whether the women were menopausal, we divided the reported cases into two groups (Table). Ascending infection from the vagina was suspected in 22 of the cases in women of <50 years of age, nearly half of whom had a precipitating factor. The entry site remained unclear in most women of ≥50 years of age, but six cases were thought to have been associated with an ascending infection from the vagina, none of which had precipitating factors.

In our case, the age and the fact that the patient waited two days before visiting the emergency department may explain the severity. Vaginal atrophy and the loss of vaginal acidity brought about by menopause are other possible risk factors for vaginal infections in postmenopausal women (59, 67).

The symptoms of GAS infection tend to be poorly localized and mimic common diseases. More than half of the 28 cases in which ascending infection from the vagina was suspected, presented with symptoms that were similar to infectious enterocolitis (for example, abdominal pain, nausea and diarrhea). We noticed that a pelvic examination was not mentioned in many of the cases. Considering that it is diffi-

Table. **GAS Peritonitis in Women.**

Age	<50	≥50
Number of patients	55	20
Possible entry site	vagina(total): 22	vagina(total): 6
	vagina(IUD/abortion): 10	vagina(IUD/abortion): 0
	URI: 14	URI: 2
	other: 5	other: 1
	unclear: 14	unclear: 11
Pelvic examination	20	9
Surgical debridement	42	11
Outcome	well: 49	well: 16
	dead: 4	dead: 3
	unknown: 2	unknown: 1
Mortality		
with surgery	4.8% (2/42)	0% (0/11)
without surgery	15.4% (2/13)	33% (3/9)

GAS: Group A *Streptococcus*, IUD: intrauterine device, URI: upper respiratory tract infection

cult to deduce the portal of entry based on the symptoms, careful history taking and a thorough physical examination, including a pelvic examination, should be performed.

Rimawi et al. stated that surgical therapy to remove the source of GAS and its toxin production is beneficial in the treatment of streptococcal toxic shock syndrome (STSS) (68). This theory may explain the high rate of exploratory laparotomy and drainage in GAS peritonitis (53 cases). Venkataramanasetty et al. and Gisser et al. reported no improvement in their patients despite early aggressive management with intravenous antibiotics, intravenous fluids, and IUD removal (30, 48). In both cases, improvement was not seen until the patients' infected tissues were debrided. Among the patients who received surgical treatment, the mortality rate was 3.7% (2 out of 53 patients), while the mortality rate among the patients who did not receive surgical treatment was 22.7% (5 out of 22 patients). These results support Rimawi's theory.

However, some patients with GAS peritonitis can be treated with appropriate antibiotics. In our case, CT-guided pelvic abscess drainage was considered, but because the improvement of the abscess was confirmed on follow-up CT, antibiotics were continued, which eventually led to complete resolution of the abscess. The patient in our case is the oldest reported woman with a suspected ascending vaginal infection caused by GAS who survived without surgical debridement. The need for surgical intervention should be carefully considered depending on the severity of the peritonitis and the clinical course after the prompt initiation of proper antibiotic therapy. To aid in the diagnosis, less invasive methods such as paracentesis of ascites, Gram staining, and rapid antigen detection tests may also be beneficial.

Conclusion

Primary GAS peritonitis in postmenopausal women is rare. As prompt treatment with appropriate antibiotics may prevent the need for surgical intervention, careful history taking and a thorough physical examination are required. Ascending infection from the vagina should always be considered in postmenopausal women if there is no other obvious cause, even when the patient is sexually inactive.

The authors state that they have no Conflict of Interest (COI).

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