Group B Streptococcal Meningitis Complicating Elective Abortion: Report of 2 Cases

The incidence of invasive disease due to Streptococcus agalactiae (group B streptococcus, or GBS) in adults has been reported [1–4]. Invasive infections reported in nonpregnant adults include skin, soft tissue, or bone infection, bacteremia with no identified source, urosepsis, pneumonia, peritonitis, septic arthritis, meningitis, and endocarditis [1]. Asymptomatic vaginal carriage of GBS occurs in 5%–35% of pregnant women [5, 6]. GBS has long been recognized as a leading cause of neonatal sepsis and meningitis and a frequent cause of postpartum endometritis. Although the incidence of invasive GBS disease in adults is increasing, this pathogen remains an unusual cause of meningitis in adults. In a recent review of 64 cases of GBS meningitis, 6 cases occurred in relation to pregnancy, and 5 of them were associated with postpartum endometritis [7]. Postpartum meningitis due to GBS in the absence of endometritis has also been reported [8–10]. To date, no case of meningitis due to GBS following abortion has been described. In fact, a review of the English-language literature revealed only 1 case of meningitis (due to Escherichia coli) complicating a septic incomplete abortion [11]. We report 2 cases of GBS meningitis complicating elective abortion, 1 of which was a septic incomplete abortion. Both women were previously healthy.

The first case was a 36-year-old woman with no significant past medical history who was transferred to our institution with a 2.5-day history of headache and progressive deterioration in mental status. The patient had undergone an elective abortion (dilation and evacuation under general anesthesia, estimated gestational age 20 weeks) 3 days prior to presentation. Methergine and tetracycline had been prescribed, but it was not known whether the patient took these medications. The day following the procedure, the patient began to complain of a headache and over the next 24 h became progressively confused. Family members reported that her gait was unsteady and that she had fallen several times on the day of admission. On presentation to an outside emergency room, she was afebrile with mild tachycardia and a normal blood pressure and respiratory rate. Multiple ecchymoses were noted about the head and face and she had nuchal rigidity. Examination of the chest, heart, and abdomen was normal. Pelvic examination revealed the uterus to be ~10 weeks’ size and boggy with questionable tenderness. Bloody, purulent-appearing discharge was noted in the vaginal vault.

On neurologic examination, the patient was described as stuporous but with no focal neurologic deficit. Numerous ecchymoses and superficial abrasions were noted on the extremities. Laboratory examination was remarkable for a hemoglobin of 10.6 G/dL and a WBC count of 31,000/mm³. Computerized axial tomography of the head was normal. A lumbar puncture was attempted, but only a very small amount of fluid could be obtained, which was sent only for a Gram stain and bacterial culture. The patient received a dose of iv cefotaxime and was transferred to our institution for further evaluation and care.

A second lumbar puncture revealed a protein of 213 mg/dL, glucose <20 mg/dL, and a WBC count of 3462 cell/mm³ (94% polymorphonuclear leukocytes). Gram stain of the CSF revealed polymorphonuclear cells but no organisms; however, the bacterial antigen detection was positive for S. agalactiae. Subsequently, cultures of blood and CSF performed at the referring institution grew S. agalactiae (penicillin MIC <0.03 mcg/mL). The culture of CSF obtained from the second lumbar puncture remained negative. A genital specimen cultured at the referring institution grew numerous S. agalactiae, S. aureus, Lactobacillus species, and a rare Gram-negative bacillus that was not further identified.

The patient was treated initially with ceftriaxone and then changed to penicillin G at a dose of 24 million units per day. Ultrasonography of the pelvis revealed an irregular intrauterine fluid collection with multiple internal echoes consistent with retained products of conception. Dilation and curettage was performed, and the pathology was consistent with gestational products. The patient’s mental status rapidly improved, although she complained of impaired hearing, and audiometric evaluation confirmed bilateral, profound sensorineural hearing loss. The patient received a total of 14 days of iv antibiotics and recovered completely with the exception of her hearing loss. Serologic testing for HIV infection was performed during her hospitalization and was negative.

The second case was a 33-year-old woman with a past history of pseudotumor cerebri who presented to the emergency room with a 1-day history of severe headache associated with neck stiffness, photophobia, fever, chills, and increasing lethargy. The patient had undergone an elective termination of pregnancy 12 days before (estimated gestational age, 7 weeks; further details of procedure unavailable). She had taken tetracycline from the time of her procedure until the day of presentation. Physical examination revealed fever (38.9°C) with tachycardia and a
normal blood pressure. Kernig’s sign was positive; the remainder of the physical examination, including the neurologic exam, was normal. Pelvic examination revealed the cervical os to be closed, without evidence of discharge. There was no ureteric or adnexal tenderness or masses. Laboratory examination was remarkable for a hemoglobin of 10.7 G/dL and a WBC count of 25,000/mm³. CSF examination revealed a WBC count of 19,700/mm³ (99% polymorphonuclear leukocytes), protein of 420 mg/dL, and a glucose of 17 mg/dL. Gram stain of the CSF revealed polymorphonuclear cells but no organisms; however, the bacterial antigen detection was positive for S. agalactiae. Results of CSF and blood cultures (both obtained after the receipt of a single dose of cefotaxime) remained negative. The patient had a single generalized tonic-clonic seizure in the emergency department. She was treated initially with cefotaxime and penicillin G and then switched to penicillin G at a dose of 24 million units per day for a total of 14 days. She recovered completely with no further seizures.

Although common in countries where induced abortion is illegal or inaccessible, morbidity and mortality from septic abortion is unusual in the United States [12]. Among the organisms that cause endometritis following abortion are the normal flora of the vagina and endocervix and the sexually transmitted pathogens Neisseria gonorrhoeae and Chlamydia trachomatis [13]. Clostridia perfringens is associated with illegal abortion and, in the developing world, tetanus is an important cause of mortality from septic abortion [14, 15]. Bacteremia is a more common complication of septic abortion than other pelvic infections [16]. In a review of 56 patients with septic abortion, Rotheram and Schick [17] found that blood cultures were positive for 34 patients (61%). Polymicrobial bacteremia was found in 18 patients (53%), and anaerobic organisms, either alone or as part of polymicrobial bacteremia, were the most common isolate, causing bacteremia in 22 patients (65%). Among the aerobic isolates, E. coli was the most common, found in 7 patients (21%), followed by GBS, which was isolated from the blood cultures of 2 patients (6%).

Despite this, meningitis appears to be a very rare complication of septic abortion, and meningitis due to GBS following elective abortion has not, to our knowledge, been previously reported. A search of the English-language literature using MEDLINE found only 1 previously reported case of meningitis complicating a septic incomplete abortion [11]. The causative organism was E. coli. An autopsy series of patients with fatal septic abortion did not reveal any cases of meningitis [18]. In contrast, a review of endocarditis due to GBS reported 7 cases associated with elective abortion, 1 of which was a septic abortion [19]. In the first of our patients, meningitis occurred as a complication of a septic incomplete abortion. In the second patient, meningitis occurred following an uncomplicated elective termination without evidence of concomitant endometritis.

Two groups of adults appear to be at high risk for invasive disease due to GBS: puerperal women and persons with severe underlying diseases such as cirrhosis and diabetes mellitus [20]. The overall mortality rate of GBS meningitis in adults is 34.4% [7]. Mortality in patients with postpartum GBS meningitis appears to be much lower, presumably because these individuals are young and otherwise previously healthy [7, 9]. Advanced age has been shown to be associated with a poor prognosis in GBS meningitis [7]; however, fatal GBS meningitis in a previously healthy young adult male has recently been reported [21].

One of our patients had deafness as a sequela of GBS meningitis. Although deafness is a well-recognized complication of bacterial meningitis, most of the data regarding this complication comes from the pediatric population where the incidence is 7%–21% [22-24]. There are very few data regarding the incidence of neurologic complications of bacterial meningitis in adults. In the largest case series of bacterial meningitis in adults published to date, no mention is made of the incidence of deafness as a presentation or sequela of meningitis [25]. Several case reports have appeared of GBS meningitis in adults complicated by bilateral sensorineural hearing loss [26-28]. However, there are insufficient data to determine if this complication occurs more frequently in meningitis due to GBS.

Both of our patients were prescribed tetracycline prophylaxis following elective abortion (although it was not known whether patient 1 took her medication) and this antimicrobial is routinely recommended for use in this setting [12]. In a recent meta-analysis of 12 studies addressing the issue of antimicrobial prophylaxis for therapeutic abortion, Sawaya et al. [29] found a substantial protective effect with the relative risk estimate for developing postabortion upper genital tract infection in women receiving antibiotics compared with those receiving placebo of 0.58 (95% CI, 0.47–0.71). Four of the 12 randomized, placebo controlled trials included in this meta-analysis compared the efficacy of tetracyclines with placebo (doxycycline in 2 studies and lymecycline in 2 studies). A statistically significant reduction in the risk of postabortion upper genital tract infection was demonstrated in both studies using doxycycline but not in the 2 studies using lymecycline. Although GBS are highly susceptible to most classes of antimicrobials, they are generally resistant to tetracyclines [30]. GBS were found in only 6% of patients with bacteremia complicating septic abortion but were isolated from 15% of genital specimen cultures from the same group of patients [17]. Based on the results of their meta-analysis, Sawaya et. al. [29] conclude that placebo-controlled trials of antibiotics for elective abortion should no longer be performed however it would appear that additional studies to determine which antimicrobials provide optimal protection from infection are needed.

In summary, bacterial meningitis is a very rare complication of elective abortion. Although bacteremia frequently complicates septic abortion meningitis is not a common sequela. In at least one of our patients, tetracycline prophylaxis failed to prevent GBS meningitis following elective abortion. Our patient...
with meningitis following uncomplicated elective termination of pregnancy, along with previous reports of GBS endocarditis following uncomplicated abortion, illustrate that bacteremic complications can occur without clinically evident pelvic infection.

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References