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Adolescent Pregnancy and Sexually Transmitted Diseases: Case Report

Ruby L. Holloway, MD,* and Richard Smith, MD†

More than 1 million teenagers become pregnant every year in the United States. Nearly one-half of the pregnancies are carried to term, while a similar number end in abortion. In Michigan this amounts to approximately 34,000 teenage pregnancies (ages 15 to 19). These adolescent patients have a high incidence of sexually transmitted diseases (STDs). Of the pregnant teens at Henry Ford Hospital, 60% present with one or more STDs. We discuss the case of a 13-year-old pregnant girl who presented at five weeks estimated gestation with gonorrhea, chlamydia, and appendiceal perforation, resulting in subsequent spontaneous abortion. Further discussion focuses on common STDs in pregnant adolescents. (Henry Ford Hosp Med J 1988;36:227-9)

The United States has one of the highest incidences of adolescent pregnancy and childbirth of any developed country. As a result, 14% to 15% of all infants born in this country have teen-aged mothers (1,2). A major consequence of increased sexual activity at an early age is a rise in sexually transmitted diseases (STDs). The most common STDs in patients in our institution are, in decreasing order: chlamydia, trichomoniasis, condyloma acuminatum, Neisseria gonorrhoeae, Gardnerella vaginalis, pubic lice, and herpes genitalis. The increase in pelvic inflammatory disease (PID) has paralleled the increase in STDs, and an increasing number of teenagers have abnormal findings on cervical cytologic examination (1,3). Higher morbidity and mortality are associated with teenage pregnancy and childbirth. STDs compound this problem.

Case Report

A 13-year-old pregnant black female, gravida 1, para 0, with an estimated gestational age of five weeks derived from the last normal menstrual period, presented to the emergency room with a two-day history of worsening right lower quadrant pain. The pain became more generalized and was associated with four episodes of vomiting. She denied fever and chills but complained of a vaginal discharge over the past five weeks. She was sexually active without use of contraceptives.

Culdocentesis yielded 10 mL of serous fluid. Gram’s stain showed gram-negative intracellular diplococci. The patient was admitted to the obstetrical gynecology service with a diagnosis of probable intrauterine gestation, acute gonorrheal salpingitis, ruptured ovarian cyst, and possible ectopic pregnancy.

Evaluation on presentation to the emergency room revealed the following vital signs: blood pressure, 120/70 mm Hg; temperature, 36.9°C (98.4°F) (oral); pulse, 88 beats/min; and respiration, 20 breaths/min. Abdominal examination revealed slightly decreased bowel sounds and moderate rebound tenderness and guarding in both lower abdominal quadrants, with the right much greater than the left. The upper abdominal quadrants were not tender. Pelvic examination revealed a purulent vaginal discharge, an erythematous nonparous cervix, moderate cervical motion tenderness, and a small, mildly tender uterus with bilateral adnexal tenderness and no adnexal masses. Rectal examination confirmed these findings.

Laboratory data revealed a WBC count of $18.7 \times 10^9/L$ (18,700/µL) with 0.89 (89%) polymorphonuclear cells, 0.06 (6%) bands, 0.03 (3%) lymphocytes, and 0.02 (2%) monocytes with adequate platelets. Hemoglobin was 129 g/L (12.9 g/dL), and hematocrit was 0.38 (38%). Urinary chorionic gonadotropin was positive, and beta-subunit human chorionic gonadotropin was 3,700 IU/L. Urinalysis showed 4 WBCs, occasional epithelial cells and RBCs, trace ketones and bacteria, nitrite negative, and leukocyte esterase negative. Cervical cultures showed numerous Neisseria gonorrhoeae, penicillin-sensitive. Culdocentesis fluid and blood and urine cultures yielded no growth. Chlamydia antigen was suspicious. Surgical abdominal cultures were positive for Escherichia coli.

On admission the patient was started on intravenous antibiotic therapy with cefoxitin, 2 g every six hours. Over the next 24 hours her temperature rose to 38.4°C (101.1°F). Repeat abdominal examination revealed marked rebound tenderness and guarding in all four quadrants. Diagnostic laparoscopy revealed acute appendicitis with rupture (subsequently confirmed histologically) with associated periappendicitis, and laparotomy was undertaken for appendectomy. Triple antibiotic therapy (ampicillin/gentamicin/clindamycin) was started postoperatively. On the first postoperative day, the patient had vaginal bleeding with passage of tissue consistent with spontaneous abortion (confirmed histologically). Pelvic ultrasound revealed no retained products. The patient was afebrile by the second day. Nasogastric tubing placed at surgery was discontinued on the seventh day, and the patient’s diet was slowly advanced. Triple antibiotic therapy was discontinued, and the patient was switched to oral antibiotic therapy with doxycycline. Pediatric Psychiatry and Social Services were consulted for psychosocial evaluation, and the patient was discharged to her grandparents’ home on the twelfth day.

Discussion

The most common sexually transmitted pathogen of female adolescents is Chlamydia trachomatis. Approximately 3 mil-

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lion chlamydial infections occur each year in the United States (4). An estimated 10 million teenage girls in this country are sexually active. Chlamydial infection rates of 8% to 26% have been reported for selected adolescent populations but vary according to age, ethnicity, sexual activity, geography, and other factors (5). The prevalence of chlamydial colonization in pregnant women ranges from 2% to 30% (5-7), and rates among pregnant adolescents have been reported to be as high as 37% (8). Most patients are asymptomatic, and a mucopurulent discharge may be the most significant clinical marker of Chlamydia trachomatis (5). Because cervical colonization may be asymptomatic, the disease may progress to involve either the lower or upper genital tracts or both. Mardh et al (9) found that isolation rates were related to the age group of patients: 10% to 20% in those less than age 20, 8.7% to 10.2% in those from age 20 to 24, and 4.8% in those greater than age 24. In a study of 396 adolescent girls (25% black, 42% Hispanic, 32% white, 1% other), Eagar et al (5) found that in the 22% of patients who were pregnant, 27% had Chlamydia trachomatis, 5% Neisseria gonorrhoeae, and 8% trichomoniasis. Westrom (10) estimated that salpingitis is ten times more likely to develop in a sexually active 15-year-old girl than in her 25-year-old counterpart, with ratios of 1:8 versus 1:80, respectively. In the 15- to 24-year-old age group, approximately 9.4% will become infertile after one episode of salpingitis and 51.6% after the third episode (10). Estimates of the risk for ectopic pregnancy escalate from 1 in 300 without salpingitis to 1 in 24 following salpingitis. Most likely Chlamydia trachomatis infection has some etiologic role in the tripled incidence of both infertility and ectopic pregnancy seen during the past decade (11).

Since pregnant adolescents with one STD are more likely to have another, patients with positive chlamydial cultures should be screened for gonorrhea, trichomoniasis, genital herpes, and other infections. The frequent coexistence of chlamydia and gonorrhea has been well documented (12,13). Eagar et al (5) reported that 42% of patients with positive gonorrhea cultures also had positive cultures for chlamydia. It is recommended that patients with gonorrhea be treated with a regimen that is also effective against chlamydia.

Cervical colonization in pregnant women may lead to cervicitis, cervical dysplasia, postpartum endometritis, and possible spontaneous abortion or intrauterine fetal demise. Infants of women with colonization have a 60% to 70% risk of becoming colonized during birth. Approximately 25% to 50% of these infants will develop conjunctivitis and 10% to 20% will develop pneumonia (7). Frommell et al (14) found similar results with perinatal transmission of 61%, inclusion conjunctivitis in 73%, and interstitial pneumonia in 18%. Wager et al (15) found that among women who underwent vaginal delivery, antepartum chlamydial infection was associated with increased risk of intrapartum fever and/or late postpartum endometritis. Ismail et al (16) demonstrated increased postpartum endometritis without significant intrapartum fever (chorioamnionitis). Martin et al (17) found a significantly shorter mean duration of gestation in women with intrapartum Chlamydia trachomatis infection as well as a tenfold higher stillbirth rate than among uninfected controls matched for age, marital status, gravidity, and race. Ismail et al (16) found no significant difference between mothers with positive and negative cultures in terms of prematurity rates or length of gestation.

Risk factors associated with chlamydial infection are highest for unwed pregnant teens in lower socioeconomic urban areas. This group is at highest risk for developing chlamydial infection and for transmitting it to their infants. They are also at risk for developing other STDs and having poor pregnancy outcomes. The incidence of chlamydia appears to be more common among black teenagers. It is difficult to determine the risk of spontaneous abortion due to chlamydia in this group since teens usually seek prenatal care later in pregnancy at approximately 14.6 weeks of gestation (18).

Hardy et al (8) found that Chlamydia trachomatis and Candida infections alone had no effect on pregnancy outcome (gestational age or birthweight). However, they found that cervical infection with Trichomonas vaginalis was associated with a reduction in the average gestational age at delivery. The lowest average birthweight of any group was among infants of mothers infected with both Chlamydia and Trichomonas. The frequency of low birthweight was four times higher in this group than in infants of mothers not infected with either organism. Trichomonas infections have been found in 13% to 23% of women attending gynecology clinics and in at least 50% of those attending clinics for treatment of STDs (19).

Gravett et al (20) reported an association between vaginal infection and preterm labor or premature rupture of membranes. Bacterial vaginosis and Chlamydia trachomatis were found to be independently associated with preterm labor and preterm rupture of membranes. Chlamydia was also associated with birthweight less than 2,500 g. In addition, bacterial vaginosis was independently associated with amniotic fluid infection. Anaerobic bacteria, Gardnerella vaginalis, and Ureaplasma urealyticum produce large amounts of phospholipase A (21). The mechanism by which maternal cervical or vaginal infection causes preterm labor or preterm rupture of membranes remains speculative but may involve effects of inflammation or synthesis and release of prostaglandins, thereby stimulating labor. Under normal circumstances, the vaginal flora becomes more homogenous during pregnancy with increased prevalence of facultative lactobacilli and decreased prevalence of anaerobes (22). Certain microorganisms associated with bacterial vaginosis may be more likely to invade intact fetal membranes or secondarily compromised areas. Metronidazole is the most effective drug for treating bacterial vaginosis, but mutagenic effects are of concern during pregnancy (20). Amoxicillin therapy is only 50% as effective. Treatment of chlamydia infections should involve concurrent treatment of sexual partners.

While approximately 1 million cases of gonorrhea are reported annually in the United States, it is estimated that an even larger number go unreported (between 2 to 9 million) (23). This suggests that one in 40 Americans are infected annually, with two of three 15- to 24-year-olds and one of four 10- to 19-year-olds becoming infected. Acute PID develops in one of eight sexually active 15-year-olds and in one of 10 sexually active 16-year-olds, but in only one of 80 women greater than 24 years old (10). Depending on the populations screened, prevalence rates of 2.75% to 7.5% have been reported among pregnant patients (24,25). Patients with a previous history of PID or Neisseria
gonorrhoeae prior to the current pregnancy represent a higher risk group which requires more diligent and frequent screening until delivery.

Some protection against PID occurs during pregnancy because of the mucus plug, antibacterial properties, and fusion of the decidua capsularis with the decidua parietalis which obliterates the uterine cavity and the choioamniotic membranes. However, there is an increased risk for dissemination of gonorrhea infection. This is usually seen in the second and third trimesters and is thought to occur secondary to asymptomatic infection in the woman, allowing for greater incubation time and thereby increasing the chances for disseminated gonorrhea. There is also an association between positive orogastic gonorrhea cultures in women and the incidence of premature rupture of membranes, chorioamnionitis, and prematurity. Neisseria gonorrhoeae is also one of the major causes of puerperal sepsis (26).

Condyloma acuminata are commonly seen and often associated with secondary infection such as trichomoniais or Gardnerella vaginalis. Adolescents may account for 25% to 50% of all patients with genital herpes infection (27,28).

Conclusions

Psychosocial factors are clearly implicated in the increased rate of STDs among teenagers. The major precipitant appears to be social change in attitudes and behavior regarding sexual activity (29). Exploration in search of sexual identity exposes the adolescent to multiple partners and STDs. Sexually active teens may be more vulnerable to infection than sexually active adults as denial is a prevalent characteristic of adolescence. Many deny the possibility of ever getting a STD as well as the possibility of pregnancy. Six of every 10 adolescent girls are sexually active by the age of 19, and four of 10 are sexually active by age 17. Of first pregnancies among unwed pregnant teens, 20% occur in the first month after initiation of sexual activity and 50% occur within the first six months (30). The risk of maternal death is 60% higher for girls under age 15 compared to young women in their early 20s (31).

Some suggested guidelines to caregivers of sexually active adolescents include (5): 1) utilize an antimicrobial regimen to treat both the chlamydial infection and associated diseases such as Neisseria gonorrhoeae, 2) maintain high index of suspicion for chlamydial infection in women with trichomoniasis or vaginal discharge of any cause, 3) culture sexually active teens for common STDs, 4) simultaneously treat sexual partners of patients with STDs, and 5) educate adolescents about the risks and sequelae of STDs.

References