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Assessment of Office-Based Care of Sexually Transmitted Diseases and Vaginitis and Antibiotic Decision-Making by Obstetrician-Gynecologists

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ABSTRACT

Objective: Survey office-based obstetric-gynecologic practitioners regarding their knowledge of infectious disease care and antibiotic use.

Methods: A survey questionnaire of multiple-choice questions was mailed to Fellows of the American College of Obstetricians and Gynecologists about clinical entities for which recommendations have undergone recent changes or about which there was a lack of consensus in a prior similar survey (Gibbs RS, McGregor JA, Mead PB, et al.: Obstet Gynecol 83:631–636, 1994).

Results: Respondents indicated that oral metronidazole was their most frequent choice to treat bacterial vaginosis. Ampicillin (57%) was used more often than penicillin (39%) for intrapartum group B streptococcus prophylaxis. Azithromycin was preferred (61%) over erythromycin-base (38%) for chlamydia treatment during pregnancy. There were several modes of practice that deviated from accepted care: 27% and 29% did not screen for chlamydia and gonorrhea, respectively, in pregnancy; 17% used cultures for *Gardnerella vaginalis* to diagnose bacterial vaginosis; 25% considered quinolones to be safe in pregnancy; 93% felt metronidazole should never be used in pregnancy; and the majority (66%) would send a patient treated successfully for pelvic cellulitis home with an oral antibiotic.

Conclusion: Respondents' infectious disease knowledge and practices in obstetrics and gynecology is appropriate in treating sexually transmitted diseases, bacterial vaginosis, and group B streptococcus. Numerous deficiencies still exist in screening for sexually transmitted diseases in pregnancy and diagnosing bacterial vaginosis, as well as in the choice of antibiotics to use or avoid for certain infections. Infect. Dis. Obstet. Gynecol. 6:247–251, 1998. © 1999 Wiley-Liss, Inc.

KEY WORDS
infectious diseases; pregnancy; treatment; prevention

Reproductive tract infections and related conditions are among the most frequently seen clinical entities in office-based obstetric and gynecologic practice. Genital tract infections are a common complaint of patients seen in nonspecialized office and clinic settings that have symptoms suggesting genital infection.[1,2]

In 1994, Gibbs et al. published the results of our

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Clinical Study

initial survey of infectious disease knowledge among obstetricians and gynecologists.[1] In that study, we found that practice patterns were appropriate for antibiotic selection in the treatment of sexually transmitted infections and postoperative infections, universal screening for hepatitis B and follow-up screening for hepatitis B in pregnancy, and treatment of urinary tract infections in pregnancy.[1] Obstetrician-gynecologists were less consistent in the appropriateness of their practices with regard to the management of ruptured membranes and premature labor and universal screening for group B streptococci (GBS). We also found in the earlier study that there was a need for more knowledge in the areas of managing perinatal viral infections and the diagnosis and treatment of other common sexually transmitted diseases (STDs). Because scientific and clinical knowledge regarding infectious diseases is advancing rapidly, we have taken the opportunity to update our prior survey, focusing on both new knowledge and areas of practice.

METHODS

Questions were pretested for clarity. A total of 1,000 randomly selected American College of Obstetricians and Gynecologists Fellows received the questionnaires. Additionally, questionnaires were mailed to 176 American College of Obstetricians and Gynecologists Fellows who are members of the Collaborative Ambulatory Research Network. The Collaborative Ambulatory Research Network was established in 1990 to facilitate the assessment of prevailing patterns in obstetric-gynecologic clinical practice and to help in the development of professional education where needed. The members of the Collaborative Ambulatory Research Network, who are a representative group of American College of Obstetricians and Gynecologists Fellows,[3] voluntarily participate in questionnaire studies such as the present investigation. It should also be noted that the physicians who participated in this survey are practitioners, not research academicians.

Survey questions were primarily face-valid, forced-choice questions pertaining to physicians' screening and treatment practices and infectious disease knowledge. In some instances, responses followed a "check all that apply" format. Some asked for a single response using a Leikert-type scale. The questionnaire was divided into three sections: 1) physician demographic information, 2) practice and knowledge, and 3) perceived educational needs.

Data were analyzed using a personal computer-based statistical software package, DOS 4.1 version. Descriptive statistics were computed for the measures used in the analyses. Group differences in responses on continuous measures were assessed using analysis of variance. All analyses were tested for significance, using alpha 0.05. We used Bonferroni's tests to guard against alpha inflation. Additionally, data were analyzed for group differences on questionnaire item responses, using a two-way analysis of variance with sex (male vs. female) and fellowship status (Collaborative Ambulatory Research Network vs. non-Collaborative Ambulatory Research Network) as between-subject factors. Because the knowledge base of recently-trained respondents might contain more current information or, conversely, because physicians trained less recently may have more relevant clinical experience, we examined two groups: those having completed specialty training less than 15 years ago vs. 15 or more years ago.

RESULTS

Data from respondents who returned the questionnaire within two months were included in the analysis. Of the 176 questionnaires mailed to Collaborative Ambulatory Research Network Fellows, 69% were returned. Of the 1,000 mailed to non-Collaborative Ambulatory Research Network Fellows, 45% were returned. There was a significant difference between Collaborative Ambulatory Research Network Fellows and the control sample of non-Collaborative Ambulatory Research Network Fellows in the response rate (chi-square = 19.52). However, there were neither significant main effects nor interactions for sex, Collaborative Ambulatory Research Network membership, fellowship status, or length of time since training. The responses were collapsed across factors in subsequent analyses.

Fifty-seven percent of all respondents were men, and 43% were women. Fifty-six percent described themselves as primary care physicians, and 44% as specialists. Most described their practice focus as general obstetrics and gynecology (81%). Thirty-seven percent indicated they practiced in an obstetric-gynecologic partnership, 38% prac-

ticed in an urban setting, and 32% in a suburban setting. Respondents' average age was 42.19 years, and they completed their specialty training an average of 10.9 years ago.

Pregnant Women

Respondents reported screening for human immunodeficiency virus (HIV, 88%), chlamydia (73%), gonorrhea (71%), and bacterial vaginosis (37%) during antenatal care. If a pregnant woman were exposed directly to cytomegalovirus in the first half of her pregnancy, 53% of respondents said they would provide counseling, perform serologic studies, and perform amniocentesis if seroconversion occurred. Thirty-six percent implied they would refer the woman for consultation.

When asked which antimicrobials are contraindicated for use during pregnancy, 75% cited ofloxacin. Conversely, 25% considered quinolones safe for use. Respondents felt that cefoxitin (99%), ampicillin (97%), and vancomycin (83%) were generally safe for indicated infections during pregnancy.

When asked to select the drug of choice for treating *Chlamydia trachomatis* in pregnancy, most respondents chose single-dose azithromycin (61%), followed by multi-dose erythromycin base (38%). At the time of this survey, the Centers for Disease Control and Prevention's (CDC) *1998 Guidelines for Treatment of Sexually Transmitted Diseases* were not published.[4] Regarding the prescription of oral metronidazole during each trimester of pregnancy, 93% of respondents said they never prescribe metronidazole during pregnancy. Among the 7% who said they do prescribe metronidazole during pregnancy, 79% said they did not prescribe oral metronidazole for use in the first trimester; 69% prescribed it for use in the second trimester, and 96% prescribed it for use in the third trimester.

When caring for pregnant women, 36% reported that they screen for bacterial vaginosis at the first visit, 2% at 20 weeks of gestation, 6% at 28 weeks, and 8% at 35 weeks. Fifty-seven percent screen only women who are symptomatic, and 11% do not screen for bacterial vaginosis at all. In diagnosing bacterial vaginosis, 93% used the presence of "clue cells" to make the diagnosis; 78%, amine odor with potassium hydroxide; 59%, milky discharge; and 48%, elevated vaginal pH. Culture for *Gardnerella vaginalis* is still used by 18% of respondents. Bacterial vaginosis was described as the most common type of vaginitis ($P = 0.001$). In counseling HIV-infected women during pregnancy, 79% of respondents said they discuss safe sex practices, 76% provided HIV pharmacological treatments, 74% provided contraceptive counseling, 65% discussed the avoidance of breast feeding, and 65% promoted and identified treatment for other family members. Respondents reported screening 20-year-old women at the initial prenatal visit, regardless of symptoms or marital status, for reproductive infections, including HIV (86%), chlamydia (73%), gonorrhea (71%), syphilis (94%), hepatitis B (93%), bacterial vaginosis (37%), and trichomoniasis (28%). Respondents then were asked about screening for reproductive tract infections in asymptomatic women, regardless of age or marital status, at the first prenatal visit. The results indicate that 87% screened for HIV, 73% for chlamydia, 71% for gonorrhea, 95% for syphilis, 93% for hepatitis B, 29% for bacterial vaginosis, and 29% for trichomoniasis.

Nonpregnant Women

In response to the question of which strategy was used with regard to sex partners of female patients with *C. trachomatis* genital infection, it was noted that 31% of the responding practitioners write a prescription for the partner, 30% refer the partner to a public health clinic, 24% refer the partner to a primary care physician, and 11% prescribe double antibiotic doses for use by both the patient and her partner.

Most physicians felt either very confident (52%) or completely confident (35%) in their ability to diagnose common causes of vaginitis. The remaining 13% revealed a lack of confidence in their ability to diagnose an infectious cause of vaginitis. With regard to the treatment of choice for bacterial vaginosis in a 30-year-old, nonpregnant woman, most practitioners surveyed (51%) chose to prescribe a regimen of 500 mg metronidazole, orally, twice a day for seven days, followed by 0.75% metronidazole vaginal gel (36%); 12% indicated they prescribe clindamycin vaginal cream.

For treating *C. trachomatis* in nonpregnant women, the drugs of choice were doxycycline (by 53%) and azithromycin (by 43%). The antimicrobial treatments of choice for symptomatic lower urinary tract infections in nonpregnant women were sulfamethoxazole-trimethoprim (50%) and ni-

trofurantoin (40%). For uncomplicated cystitis in a 25-year-old gynecologic patient, the preferred duration of therapy was three days (42%) or seven days (41%). Single-dose treatment was favored by 17% of respondents.

Physicians reported their primary antibiotic regimen for treating pelvic inflammatory disease (PID) is cefoxitin or intramuscular cefotetan plus oral doxycycline (54%), followed by ofloxacin combined with a single dose of azithromycin (16%). Other regimens used to a lesser degree include oral doxycycline (8%), ofloxacin or levofloxacin combined with metronidazole (6%), ofloxacin combined with single-dose azithromycin (5%), ofloxacin or oral levofloxacin (4%), oral azithromycin (3%), azithromycin and oral metronidazole (3%), and oral ampicillin (1%). When asked what is the appropriate indication for imipenem/cilastatin, the great majority (85%) selected the response "serious infection with suspected nosocomial organism." When asked which infectious diseases they would treat with a 1-g dose of azithromycin, 93% responded urogenital chlamydia infection. Conversely, 80% indicated they would not use such a dose to treat gonorrhea, 97% would not use it to treat urinary tract infections, and 99% would not use it to treat pseudomembranous colitis. When asked about the use of oral antibiotics after successful parenteral therapy for postoperative cuff cellulitis, most respondents (66%) indicated they would send their patients home with a prescription for seven days' worth of oral antibiotics. The remaining 24% indicated they would discharge a patient with no oral antibiotic therapy.

EDUCATION

When asked specifically how they would like to learn more about reproductive tract infections, over half (52%) of respondents cited continuing medical education programs as their preferred source of information. Grand rounds were preferred by 38% of respondents, followed by computer-based Internet resources (25%), and contact with pharmaceutical representatives (21%).

DISCUSSION

We surveyed obstetricians' and gynecologists' clinical knowledge and practices regarding common infection-related clinical entities and antibiotic choices. As in a prior study, the respondents generally demonstrated knowledgeable and well-founded clinical approaches, especially in regard to diagnosis and treatment of STDs, including HIV, in both pregnant and nonpregnant women. On the other hand, sizable numbers of practitioners persisted in practices that are unsupported in the literature, including 1) use of *G. vaginalis* cultures to diagnose bacterial vaginosis, and 2) discharging patients with satisfactorily treated posthysterectomy cuff cellulitis with a prescription for oral antibiotics.

The questionnaire also detailed current practice patterns among respondents, which will be of interest to policymakers and authoritative organizations. Most respondents prefer using a culture-based approach rather than intrapartum risk-indicated chemoprophylaxis to prevent early onset GBS sepsis in newborns. Most physicians preferred the more broad-spectrum ampicillin intrapartum treatment to prevent GBS neonatal sepsis rather than the more narrowly-focused penicillin intrapartum chemoprophylaxis, even though penicillin is recommended by the CDC and the American College of Obstetricians and Gynecologists.[5,6] The choice of antibiotic in this clinical situation is an empirical one. Ampicillin is more broad spectrum, but some fear the growth of resistant facultative, gram-negative bacilli in neonates when this agent is used. Others feel the broader coverage offers advantages in eradicating pathogens other than GBS. Otherwise, in this study the CDC patterns were followed regarding antibiotic choices.

Azithromycin was preferred over erythromycin for treatment of chlamydial infections during pregnancy. On the other hand, most physicians use an inexpensive, multi-dose doxycycline regimen over a single-dose azithromycin for chlamydia treatment in nonpregnant women and their partners. Interestingly, most study participants indicated they routinely indirectly treat or refer contacts of women with chlamydial genital infections. If true, this appears to be a change from past practices and may have been influenced by a greater understanding of STDs and their physical, psychological, and economic consequences for patients, providers, and payers.[7] Indirect treatment could include seeing and treating the partner or contact, writing a prescription for a partner without seeing him, or writing a prescription with a refill to the female instructing her to give the refill to her partner. If physicians are treating the partner of their patient

without seeing them, is this ethically sound? This issue must be addressed with the development of public health or professional practice guidelines.

Variations in responses regarding some entities and practices show the need for ongoing continuing medical education and promulgation of guidelines to translate present knowledge into everyday practice. Fully 25% of respondents considered a quinolone antibiotic as useful during pregnancy, although quinolones are contraindicated in pregnancy because of their effect on the fetal skeletal system.[8] Also, 17% still employ culture for *G. vaginalis* as a means to diagnose bacterial vaginosis, when this has been shown not to be a reliable means of diagnosing this disorder.[8] Sixty-six percent of respondents would send a patient successfully treated for a postoperative cuff infection home with a prescription for oral antibiotics, in spite of data that indicate this is not necessary.[9] Large numbers of obstetrician-gynecologists do not prescribe metronidazole in pregnancy, even though no data exist to show damaging effects on neonates.[10,11] These findings indicate a need for focused continuing professional education to correct these deficiencies.

We have identified the following areas as ones that need to be addressed more effectively: 1) the inefficacy of cultures to diagnose bacterial vaginosis; 2) the effects of viral infections in pregnancy and how to screen and counsel pregnant women, 3) how to treat and manage the partners of STD-infected patients; and 4) the safety and use of antibiotics in pregnancy, including azithromycin, quinolones, and metronidazole.

We conclude the following improvements in practice have occurred since the first survey: 1) screening for STDs in pregnancy; 2) use of GBS screening and prophylaxis; 3) referral or treatment of partners of STD-infected patients; 4) agreement with CDC guidelines in treatment regimens for STDs surveyed and PID; and 5) HIV counseling.

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