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Care Seeking Behavior after Notification among Young Women With Recurrent Sexually Transmitted Infections (STIs) after Pelvic Inflammatory Disease (PID)

Arlene M. Butz, ScD, CRNP¹, Charlotte Gaydos, DrPH², Shang-En Chung, ScM³, Betty H. Johnson, BSN, RN¹, Steven Huettner, BS¹, and Maria Trent, MD, MPH¹

¹The Johns Hopkins University School of Medicine, Division of General Pediatrics and Adolescent Medicine

²The Johns Hopkins University School of Medicine, International STD and Bio threat Laboratory

³The Johns Hopkins University School of Medicine, Division of Pulmonary and Critical Care

Abstract

Objective—To determine the level of nurse case management and outreach required to notify young women with sexually transmitted infection (STI) positive test results after pelvic inflammatory disease (PID) and percent seeking treatment.

Methods—Participants (N=153) were enrolled in a clinical trial of young women diagnosed with PID and followed for 3 months for recurrent STIs. Vaginal swabs were obtained at 1 and 3 months. All participants were notified of positive STIs at 1 and 3 months and treatment arranged. Data were analyzed with logistic regression for comparison of treatment status by number of nurse contacts.

Results—Over the 3-month period 59 participants (38.6%) tested positive for one or more STIs and all received notification. Only 50% (19/38) of participants with STI at 1 month and 43% (16/37) at 3 months received treatment.

Conclusions—Despite the high notification rate of positive test results for young adults with recurrent STIs, many failed to seek treatment.

Keywords

Adolescent; STI; PID; nurse case management; outreach

Introduction

Although pelvic inflammatory disease (PID) is highly preventable, adolescents and young adults are at particularly high risk for recurrent infection due to non-adherence to prescribed treatment and recommendations for timely follow-up.⁽¹⁾ Recurrent sexually transmitted

Corresponding Author: Arlene Butz, ScD, RN, Professor and Co-Investigator, Johns Hopkins University School of Medicine, Division of General Pediatrics and Adolescent Medicine, 200 N. Wolfe ST., Baltimore, MD 21287, 410-614-5963 (Phone), 410-502-5440 (Fax), abutz@jhmi.edu.

infections (STIs) after PID are associated with infertility, chronic pelvic pain, ectopic pregnancy, and repeated emergency department (ED) visits.⁽²⁻⁴⁾ Historically, management of PID included hospital admission, yet outpatient treatment and follow-up is now standard therapy.^(5,6) Standard care for mild-to-moderate PID is outpatient treatment with a 72 hour follow-up.^(6,7) However, follow up rates after PID diagnosis are low; less than one-quarter of adolescents with PID complete the CDC recommended 72 hour follow-up after a PID diagnosis.⁽⁸⁾ Moreover, there is no data examining clinical follow-up rates for high-risk adolescents diagnosed with recurrent STIs after PID. Available data on American women demonstrate that adolescents have a shorter time to recurrent PID than adult women.⁽⁹⁾ Women diagnosed with recurrent episodes of STI are significantly more likely to suffer from chronic pelvic pain than women without recurrent PID.⁽²⁾

Significant barriers for STI-care seeking behavior exist for urban adolescents at high risk for the complications of recurrent STIs. Perceived barriers to receiving treatment include poor knowledge of the cause and treatment of STIs, lack of understanding the consequences of untreated STIs such as infertility, and fear of safety in current sexual relationship and reputation.^(9,10) Thus, it is imperative to ensure that adolescent and young women are notified of positive test results and have access to youth-friendly, developmentally appropriate, expedient, high quality services for STI treatment. Further, appropriate treatment for recurrent STIs in young adults includes risk reduction counseling, assistance with partner notification and patient and partner treatment after diagnosis of PID.⁽¹⁰⁾ The objectives of this preliminary data analysis were (1) to determine the level of nurse case management and outreach time required to communicate positive test results to adolescents and young adults diagnosed with recurrent STIs after an index PID diagnosis and (2) to examine their subsequent care seeking behaviors for treatment of STI after notification of positive test results using a referral system.

Methods

Preliminary data are presented for 153 urban adolescents and young adults diagnosed with PID and enrolled in the Technology Enhanced Community Health Nursing (TECH-N) study, a single-blind design, randomized controlled trial of a texting intervention combined with a nurse home visit intervention to reduce subsequent STI infections. The Johns Hopkins Medical Institutional Review Board approved the study protocol. TECH-N participants were recruited from adult and pediatric emergency departments and an academic hospital based pediatric and adolescent medicine clinical practice. Participants completed a baseline audio computerized assisted self-interview (ASCASI) in the acute care setting during which they were queried about demographic information and reproductive health history. All participants completed a community-based research visit by a community outreach worker after completion of the 14-day antibiotic treatment course for the index PID diagnosis, to assess interim care and medication adherence.

Participants then completed research visits at 1 and 3- months during which they completed an additional ACASI and provided biological specimens via vaginal swab for STI testing for *Neisseria gonorrhoea* (GC), *Chlamydia trachomatis* (CT), *Trichomonas Vaginalis* (TV) and *Mycoplasma genitalium* (MG). The Johns Hopkins International Sexually Transmitted

Disease Research Laboratory processed all specimens. Vaginal specimens were tested for Chlamydia trachomatis and Neisseria gonorrhoea using the Aptima Combo 2 (Gen-Probe/Hologic, San Diego, CA). The vaginal swab was tested for Trichomonas Vaginalis using the Aptima TV transcription mediated amplification (TMA) assay (Gen-Probe/Hologic, San Diego, CA). Likewise, the sample was tested for *Mycoplasma genitalium* in similar manner to other TMA assays using the Analyte Specific Reagent (ASR). All positive results were sent to the co-investigator study nurse within 7–10 days after specimen collection for participant notification of test results. The local health department was notified of positive test results per Maryland state law. Only GC and CT infections are reportable in the State of Maryland.⁽¹¹⁾ Participants testing positive for one or more organisms during the 1 and 3-month research visits were contacted by the study nurse co-investigator via phone to alert them that their lab results were available, arrange a conversation about the positive results, and to refer the participant for treatment. Participants were referred to their primary care provider and/or the institutional Title X clinic for treatment. The Title X clinic is located within the Adolescent and Young Adult clinic within the main recruitment clinic and approximate to the hospital emergency departments from which most patients were recruited.

For participants who could not be located by phone, the community outreach worker tracked these participants using data provided by participants at baseline and via home visits. Nursing and outreach staff tracked the number of attempts required to make contact with the patient, date of final notification of positive results and referral site selected for treatment by the participant. At enrollment, participants provided consent for the research team to contact their primary care provider and/or other treating providers to verify treatment and care utilization. Care utilization was then tracked using the referral site identified by the participant, the electronic health record at the study institution, and health department records for treatment for reportable disease. Participant who did not have a record of treatment using any of these sources were categorized as untreated in the database.

The primary outcomes for this analysis were number of nurse contact attempts required for notification of positive STI and treatment status (treated versus non-treated) after notification of test positive results at 1 and 3-month post index PID diagnosis. Data analysis included initial descriptive statistics and bivariate analyses to compare sociodemographic and health characteristics by infection status (positive versus negative) using t-test or chi-square test. Logistic regression analyses were then used to evaluate difference in treatment status by number of nurse contacts for follow-up, participant age, age at sexual debut, and number of lifetime partners. All analyses were conducted by SAS Version 9.⁽¹²⁾

Results

Demographics

The sample consists of 153 adolescents and young adults aged 13–25 years who were enrolled in the TECH-N trial. As seen in Table 1, most participants were African American (92%), had a mean age of 18.8 (SD 2.1) years and obtained less than high school education (76%). Mean age of sexual debut was 14.6 (SD 1.7) years with a range of 11–18 years. Mean number of lifetime partners was 6.3 (SD 7.6). Participants testing positive for any STI

over the 3-month period (N=59) did not significantly differ by race/ethnicity, age, age at sexual debut and number of lifetime partners when compared to participants testing negative. Participants with a positive STI over the 3-month period were less likely to be a high school graduate or receive a higher education (OR: 0.06; 95%CI 0.01, 0.48).

Characteristics of Nurse Contacts and Outreach

All participants were contacted to share positive tests results from the 1 and 3-month follow-up, however, the number of contacts required to reach the participant ranged from 1–10 contacts per participant. Anecdotally, one-third of participants with positive results requested information about the infection including mechanism of transmission, type of infection and whether partner would need treatment. Mean nurse contacts did not differ by follow-up time point (1-Month: 2.81 (SD 2.2), range 1–10 contacts; 3-Month: 2.43 (SD 1.5), range 1–5 contacts). An outreach worker was required to assist with locating 10% (6/59) of participants with positive results for the 3-month follow-up who were unreachable by phone. As seen in Table 2, mean nurse contacts did not differ by follow-up time period or treatment status (Treated versus Not Treated) nor by participant age or sexual debut age. However, mean number of lifetime partners was significantly higher for participants with positive results at 3-months regardless of treatment status (OR: 1.01, 95% CI: 1.0, 1.1).

STI Follow-up and Treatment Status

As seen in Figure 1, a total of 59 participants (38.6%) tested positive for one or more STIs over the 3-month period at either or both time points. Of the 43 participants who had a positive follow-up at either time point, those with one STI had a higher treatment rate (53%) as compared to participants with 2 or more STIs (33%) treatment. Further, participants who tested positive at both time points (N=16) had lower treatment rates (17–33%) than participants who tested positive at only one time point. Only one-third of participants with two or more infections at both time points received treatment for a STI.

Several significant process barriers were encountered in locating participants with positive results for notification of their positive results. The most frequent barriers included disconnected phones and unknown participant's location/residence by family members identified by the participant for future contact in the tracking database. Less frequent but significant barriers were participant incarceration (n=2), partner incarceration (n=3), and participant experiencing a miscarriage resulting in additional hospital care (n=1). Anecdotal reported barriers to lack of adherence to treatment follow-up included conflicts of scheduled clinic visit with school, sports or work and lack of understanding the need for STI treatment.

Discussion

This group of low-income young women required intensive nurse case management and community outreach to ensure effective and timely treatment for recurrent STI infections. Yet, at best only half of the young women sought care for treatment for positive STI notification resulting from the 3-month visit, despite receiving notification about the STI and an opportunity to speak with the nurse regarding the infection. This is particularly problematic because patients were offered clinical services free of charge through the Title

X Adolescent/Young Adult program associated with the academic center. Anecdotally, completion of clinic appointments frequently required multiple scheduled appointments that were communicated to the adolescent and/or young adult, yet appointments were not kept. Primary reasons for lack of adherence to scheduled appointments included conflict with school, sports and work hours and lack of recognition of importance of STI treatment. Further, limited reproductive health literacy related to STI prevention may have contributed to the low rate of follow-up detected in this study. Many participants (33%) requested additional education regarding the type of infection, mechanism of transmission and need for treatment during calls with the study nurse.

Because over half of urban adolescents and young women with a known STI did not seek treatment after notification of a positive STI test result, these adolescents are positioned for significant reproductive sequelae and potential transmission of STIs. Adolescents with the highest treatment rates in our study were positive at the 1-month after the baseline PID diagnosis as compared to the longer 3-month follow-up period suggesting the need for more frequent and longer monitoring of young women at high risk for recurrent infections. The untreated STI rates in our study are substantially higher than those reported for syphilis cases (6% untreated cases) in prior report.⁽¹³⁾ One explanation for the difference in treatment rates is that most likely untreated syphilis cases received more aggressive follow-up by health departments around the country to ensure successful follow-up treatment.⁽¹⁴⁾ Our data indicate comparable intensive treatment is needed for follow-up of all STIs (GC, TV, CT and MG) in adolescents and young adults particularly after a PID diagnosis.

Several additional significant barriers to optimal follow-up for PID exist in urban young women at high risk for recurrent STIs. Recurrent STIs are often asymptomatic and/or present with mild or subtle clinical symptoms, therefore, many adolescents and young women may delay treatment resulting in inflammatory consequences (e.g., PID) in the upper reproductive tract.⁽¹⁵⁾ Concerns about confidentiality and parental consent may present as a barrier for some adolescents. However, data from this group of women demonstrates that 68% of urban young women with PID notified a parent of their PID diagnosis and of those 50% received some support with care.⁽¹⁶⁾ Alternatively, partner attitudes and beliefs regarding treatment for STIs may impede the young women to seek treatment for herself and her partner^(10, 17) resulting in recurrent STI. Relying on the adolescent to notify their partner is most effective in long-term relationships. However, with a mean of six lifetime partners by age 18 years, this may not be the norm for adolescents in our sample. Due to the lack of public health funding, health departments do not take action to notify partners for the most frequent STIs⁽¹⁰⁾ tested in our study. Therefore, the responsibility for partner notification was placed on the adolescent. Because partner notification of STI exposure is critical for prevention of recurrent infections, interventions targeting positive attitudes about partner notification may result in lower rates of recurrent STIs⁽¹⁸⁾ for young women after PID.

The findings from this study must be considered in light of several limitations. Because this study occurred in a single center and community the results may not be generalizable to other academic centers or communities. Second, our treatment rates may be underestimated. While an exhaustive search of medical records, health department treatment data, and primary care provider follow-up records was performed, it is possible that participants may

have received treatment through another source of care resulting in an underestimate of successful treatment.

Conclusions

In this sample, the frequency of short-term recurrent STIs is consistent with national PID data,⁽⁹⁾ yet with the high notification rate of positive test results for participants, many young women failed to seek care for treatment after notification of test results. This is concerning given the known adverse consequences of STIs on reproductive health⁽⁹⁾ and the value of PID prevention⁽¹⁹⁾ and preservation of future fertility⁽²⁰⁾ for urban youth. Future studies will be needed to test novel community based interventions to increase adherence to follow-up after a PID diagnosis. Finally, the role of primary and acute care settings for treatment follow-up after PID diagnosis in this vulnerable population of young women should be explored.

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Fig. 1.
Follow-up and Treatment Status over 90 Day Study Period

Table 1

Sociodemographic and Health Characteristics of Sample N=153

Characteristic	All Participants N=153 N (%)	Participants with a Positive STI over 3 month follow-up ^a N=59 N (%)
Race/ethnicity African American	141 (92%)	51 (93%)
Age (Mean, SD) years	18.8 (2.1)	18.7 (2.1)
Education HS grad or more education	37 (24%)	5 (8%)
Sexual Debut Age (Mean, SD) years (Range 11–18 years)	14.6 (1.7)	14.5 (1.8)
Number of lifetime partners (Mean, SD)	6.3 (7.6)	7.6 (10.7)

^aComparison between participants with and without positive STI were non-significant ($p > 0.05$) excluding high school graduate or higher education. Participants with positive STI were less likely to be high school graduate or have higher education (OR:0.06; 95% CI 0.01,0.48).

Characteristics Associated with Treated vs. Not Treated Positive Results at 1 and 3-Month Follow-up (n=75)

Table 2

	1-Month Follow-up N=38 Positive Results		3-Month Follow-up N=37 Positive Results		Statistic
	Treated N=19 Mean (SD)	Not Treated N=19 Mean (SD)	Treated N=16 Mean (SD)	Not Treated N=21 Mean (SD)	
Mean Nurse Contacts Range: 1–7)	2.1 (1.0)	3.2 (1.8)	2.2 (1.4)	2.7 (1.4)	0.58 (0.3, 1.0) 0.76 (0.5, 1.2)
Age (yrs)	18.2 (1.8)	18.7 (2.1)	18.6 (1.9)	19.2 (2.0)	0.89 (0.6, 1.3) 0.84 (0.6, 1.2)
Sexual Debut Age (years)	14.6 (1.9)	14.2 (1.7)	14.2 (1.8)	14.5 (1.8)	1.16 (0.8, 1.7) 0.93 (0.6, 1.4)
Lifetime Partners	5.1 (2.8)	5.9 (5.5)	10.7 (13.3)	9.0 (13.4)	0.95 (0.8, 1.1) 1.01 (1.0, 1.1)