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Impact of Post-visit Contact on Emergency Department Utilization for Adolescent Women with a Sexually Transmitted Infection

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Abstract

Study Objectives—To understand Emergency Department (ED) utilization patterns for women who received sexually transmitted infection (STI) testing and explore the impact of post-visit telephone contact on future ED visits.

Design, Setting, Participants—We performed a secondary analysis on a prospectively collected dataset of ED patients ages 14–21 years at a children's hospital.

Interventions and Main Outcome Measures—The dataset documented initial and return visits, STI results, race, age and post-visit contact success (telephone contact ≤ 7 days of visit). Logistic regression was performed identifying variables that predicted a return visit to the ED, a return visit with STI testing, and subsequent positive STI results.

Results—Of 922 women with STI testing at their initial ED visit, 216 (23%) were STI positive. One-third (315/922) returned to the ED, 15% (141/922) returned and had STI testing, and 4% (38/922) had a subsequent STI. Of 216 STI-positive women, 59% were successfully contacted. Of those who returned to the ED, age ≥ 18 and Black race were associated with increased STI testing at a subsequent visit. Successful contact reduced the likelihood of STI testing at a subsequent ED visit (OR 0.28, 95% CI 0.01–0.8), and ED empiric antibiotic treatment had no effect on subsequent STI testing.

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Conclusion—Contacting women with STI results and counseling them regarding safe sex behaviors may reduce the number of ED patients who return with symptoms or a new exposure necessitating STI testing. The high STI prevalence and frequent return rate suggest that ED interventions are needed.

Keywords

Adolescents; Sexually transmitted infections; Health care seeking behavior; Emergency department

Introduction

There is a national epidemic of sexually transmitted infections (STI) among adolescents.¹ In greater Cincinnati, the rates of *Chlamydia trachomatis* (CT) and *Neisseria gonorrhoeae* (GC) per 100,000 population is higher than that seen in other, comparable urban cities.¹ Further, STI prevalence in the emergency department (ED) at our institution is 5–10 fold higher than national rates.^{1,2} At our institution's ED, approximately 100 women are tested monthly for STIs and approximately 22% tested are positive for at least 1 curable STI (CT, GC, or trichomoniasis vaginalis (TV)).³ Thus, we expect that strategies to improve STI care in our ED will have a significant impact on our community's STI epidemic.

Previous literature demonstrates that adolescents are likely to use a hospital ED for primary care services related to sexual and reproductive health such as STI diagnosis and treatment, yet they continue to receive suboptimal care.⁴ Some women with STIs remain untreated due to the lack of effective follow-up.⁵ Even young women who receive treatment are at high risk for re-infection due to the lack of effective communication regarding their positive STI result and short-term prevention counseling.⁶ However, clinical practice in our ED was similar to that of others: notify patients with an STI only if they were not treated at their visit.⁵ In qualitative interviews, ED personnel at our institution cited time constraints, the difficulty in reaching adolescents, and the ease of empiric treatment to justify the practice of empirically treating STI tested patients and only providing follow-up contact to those who tested positive but were not treated at the ED visit.⁷ In our prior work, we showed that adolescent women were more likely to engage in safer sexual behaviors after being notified of a positive STI result, whereas empiric treatment at the visit did not impact their behavior.⁸ We hypothesized that contacting all patients with a positive STI test would not only provide an opportunity for awareness of test results and prevention counseling, but may also impact future ED utilization by decreasing the need for ED return visits with STI testing. We anticipate that demonstrating this impact would increase provider and institutional support for our endeavors to improve post-visit STI care.

Our aims were: (1) to understand the pattern of ED utilization for adolescent women who had STI testing at an initial ED visit and (2) to determine if the previously implemented interventions to improve STI post-visit contact in the ED had an impact on the number of future STI related ED visits.

Materials and Methods

Study Design, Setting, and Population

This was a retrospective analysis of data that were prospectively collected for a quality improvement (QI) project, which is fully described in our prior work.³ This data was obtained in a busy, urban ED with a high volume of adolescent visits and a high prevalence of STIs. We identified a cohort of all female patients ages 14–21 who were tested for STIs in the ED between January and October 2009. The decision to perform ED STI testing was at the discretion of the providing physician. However, routine screening and tests of cure are not routinely done in our ED. Instead, testing is performed among symptomatic patients, patients who identify new STI exposures, or at specific patient request. This database was part of a previous Institutional Review Board (IRB) approved study and this current study was designated as exempt by the IRB and thus the requirement for written informed consent was waived.

Study Protocol

In a previous QI project, we instituted a series of interventions aimed at improving post ED visit patient contact among patients with a positive STI result. The QI project database was constructed by prospectively recording a medical record number, demographic information (age and race), mode of STI testing (NAAT using urine or cervical swabs for GC/CT and vaginal swabs for wet prep direct microscopy, trich culture or trich antigen testing), STI test results and subsequent visits and testing during the study time period. Results were coded as positive if a CT, GC, or TV test was positive, and negative if all tests were negative. For women who were STI positive, we prospectively recorded whether they were treated at the initial ED visit (defined as receiving appropriate antibiotics in the ED or a written prescription upon discharge) and whether or not they were successfully contacted within 7 days of the ED visit. The initial quality improvement study included periods of both unidirectional (the ED contacted the patients), and bidirectional (patients can also contact the ED) contact methods.³ During the study period, the nurse practitioner attempted to contact all patients testing positive for STIs, regardless of whether or not they received empiric treatment at the ED visit. The nurse developed a treatment plan for each patient who was positive and not initially treated at the ED visit. She also discussed the importance of short term abstinence, partner notification, testing and treatment and future safe sex behaviors. Successful contact was defined as a documented telephone voice to voice conversation within 7 days of an ED visit. After conclusion of the QI portion of the study, medical record numbers were replaced to generate an anonymized data set that linked initial and follow-up visits.

Outcomes

The key outcome measures included: (1) the proportion of adolescent women who returned to the ED for a subsequent visit, (2) of those who returned, the proportion who were STI tested based on clinical symptomatology, STI exposure or patient request, and (3) of those who were retested, the proportion who were STI positive.

Data Analysis

Descriptive statistics were used to determine the pattern of visits for women with STI testing in the ED during the study period. Chi-square analyses were conducted initially to determine which variables (race, age, initial STI result, post-visit contact success, and treatment status) were related to our 3 outcomes. Variables with significance levels of $P < .1$, and the clinically important variable of a positive STI test at baseline were candidates for the multivariate logistic regression model. To attempt to reduce collinearity, we performed backward stepwise regression to develop the final multivariate regression model.

Results

During the 10-month study interval, 922 women aged 14–21 years visited the ED and had STI testing. Self-reported race included 71% black, 24.6% white, and 4.4% other. Fig. 1 shows the utilization patterns of women in the study, with branch points denoting the STI test results and contact. At the first visit, 216 (23.4%) women tested positive, and 127 (58.8%) of these were successfully contacted within 7 days. Contact status on 9 patients was unknown, but their return ED visit and STI testing status was recorded and included in the overall data. As seen in Table 1, the proportion of adolescents who returned to the ED (outcome 1) was 34% (315/922). Most made only 1 return visit, but 67 (21% of returners) made 2–4 visits, and 4 women returned >4 times in 10 months. The proportion who had a return visit with STI testing (outcome 2) was 15% (141/922). Of those who returned, 45% (141/315) were retested. The proportion who had a repeat positive STI test result (outcome 3) was 4.1% (38/922). Of those who returned, 28% (38/141) had a repeat positive STI test result.

In Table 2 we show the factors associated with repeat STI testing for women who made a return visit to the ED ($n = 315$). Chi-square testing showed that compared to those without STI testing, those for whom STI testing was performed at a subsequent visit (ie, patients who were symptomatic, those for whom there was a concern for a new STI exposure, or those who requested STI testing) were significantly more likely to be Black (89% vs. 77%, $P = .008$) and $\geq$ age 18 (49.6% vs. 33%, $P = .003$). In the multivariable LR analysis, age ≥ 18 years (OR 1.7, CI 1.05–2.8) and Black race (OR 2.3, CI 1.1–4.5) were each associated with an increased likelihood of returning to the ED and having repeat STI testing. In contrast, successful contact was associated with a decreased likelihood of repeat STI testing (OR 0.28, CI 0.1–0.8). Baseline STI results and initial treatment status did not appear to have an impact.

Of those women who returned to the ED and were retested ($n = 141$), LR showed that an initial positive STI test was the only significant predictor of a subsequent positive STI test (OR 3.6, 95% CI 1.6–8.6) after controlling for race and age. Initial empirical treatment of those successfully contacted was not predictive of a subsequent positive STI test.

Discussion

Because STI screening and the clinical practice of providing a follow up “test of cure” is not routine care in ED settings, the adolescents in this study all had clinical indications for STI

testing at the initial and subsequent visits (ie, symptomatic, recent or new exposure or presented with a specific request for STI testing). To our knowledge, this study is the first publication that demonstrates that improved adolescent STI follow-up care in the ED may impact the pattern of subsequent acutely indicated STI testing in the ED as opposed to routine STI screening. In contrast, empiric antibiotic treatment in the ED had no effect on future repeat STI testing. This supports our hypothesis that contacting women after an ED visit not only can provide prevention counseling and positive STI status information, but post-visit contact may also encourage short-term behavior changes that decrease the likelihood of repeat STI testing at a future ED visit.

Adolescent women who require STI testing at an initial ED visit are at high risk: 23% were positive for at least 1 curable STI. These young women also use the ED frequently for primary care services as one-third returned to the ED within 10 months. Although our successful contact was imperfect (59%), our results suggest that providing telephone contact after an initial positive STI result reduced the likelihood that STI testing was indicated (ie, symptomatic, new exposure or patient request) during subsequent ED visits. This outcome could be explained by a combination of several factors: women who are contacted about their positive STI test results may take action to reduce their own risks and thus they may be less likely to develop STI symptoms or complications indicating re-infection or poor compliance with medication. Alternatively, receiving additional health information through post-visit contact may have provoked more STI testing as a manifestation of health empowerment or improved health seeking behavior. This may have been the case; however, patients who were seeking STI screening may have obtained that screening in other healthcare settings outside of the ED and this data we are unable to measure. The high prevalence and high rate of STIs in the retested ED population (54%) supports the rationale for providing routine STI screening in an ED setting.

These results are in congruence with our previous work, showing that when young women are aware of a positive STI result they are more likely to report their status to their partner(s) and adopt the risk-reduction behaviors recommended by the Centers for Disease Control.⁸ In addition, confirmation of a positive STI result combined with the woman's belief that she tested positive (point of care result given at initial ED visit) were associated with abstinence, partner discussion, and partner testing. Thus, contacted women may be at lower risk for re-infection. It is possible that by contacting women and informing them of their positive STI test results, these young women were more likely to complete their medications, less likely to have persistent or worsening symptoms, and consequently had no clinical indication for the clinician to order repeat STI testing at the subsequent ED visit. Although, it is possible that clinicians may have altered their clinical practice because they perceived that contacted women were at lower risk for STIs. In our system, follow-up notes and contact messages are not flagged in the electronic medical record; thus most clinicians would be unaware of STI contact attempts and success or failure.

As others have shown, a significant number of adolescents seek medical care in the ED for primary care services, including care for STIs.^{9,10} When adolescent women present to the ED with STI-related symptoms, clinical interventions can include diagnostic testing, empiric antibiotic therapy, STI prevention counseling and post-visit follow-up such as the telephone

contact we provided in this study. Data from the National Hospital Ambulatory Medical Care Survey suggests that STI care provided in the ED is often suboptimal.⁴ In many EDs, empiric therapy is the norm, and follow-up contact is only provided to women who are untreated at the initial visit.^{11,12} However, others have emphasized the importance of systematic and efficient follow-up with positive results of all female patients after ED release.^{5,13} Recently, we showed that we can improve our ability to contact women with their STI test results, and reduced our lost to follow-up rate from 40% to 24%.³ Thus, timely follow-up of positive STI results is a necessary public health intervention for adolescent women utilizing the ED.

There are several limitations of our study. The database for this study does not include the chief complaint or reason for the ED visit, and we are unable to obtain data evaluating symptoms or final diagnoses for those with STI testing at initial or return visits. We also were unable to determine if women made subsequent visits to other health care providers during the study window. In future studies, it would be important to document the chief complaint, symptoms, diagnosis, and visit to other healthcare settings to further understand the impact of STI follow-up contact on return ED visits by adolescents. With this data, we could assess the incidence of serious outcomes including pelvic inflammatory disease.

Conclusions

After an initial positive STI test, women who were contacted regarding their positive STI test results in a timely manner were less likely to return to the ED and to receive STI testing at their subsequent ED visit. In contrast, empiric antibiotic treatment in the ED had no effect on future STI testing. This supports our hypothesis that contacting women after an ED visit is a worthwhile clinical intervention that is potentially more valuable than the current practice (empiric antibiotic therapy). That 23% of women with STI testing in the ED were positive for at least 1 treatable STI and one-third returned to the ED illustrates the scope of the problem and the potential impact that ED interventions may have on the STI epidemic.

Acknowledgments

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Fig. 1.
Outcomes for adolescent women seen in the ED with STI testing at the initial visit.

Table 1

Demographics and ED Utilization Pattern of Women with a Positive or Negative STI Result at Initial ED Visit

	STI Tested on Initial Visit n = 922, n (%)	STI Positive n = 216, n (%)	STI Negative n = 706, n (%)	P Value [*]
Black race [†]	654 (74.2)	188 (90.8)	466 (69.1)	<.001
Age 18 y	376 (41.5)	108 (50)	265 (37.5)	.001
Treated at ED visit	549 (59.4)	158 (73.1)	391 (55.4)	<.001
Contacted [‡]	127 (13.9)	127 (61.4)	N/A	N/A
Return ED visit	315 (34.2)	73 (33.8)	242 (34.3)	.89
Return ED visit with STI testing	141 (15.3)	32 (14.8)	109 (15.4)	.82
Repeat positive STI test at return ED visit	38 (4.1)	16 (7.4)	22 (3.1)	.005

ED, Emergency department; STI, Sexually transmitted infection; N/A, Not applicable

^{*} Chi-square testing.[†] Total n = 881, STI positive n = 207 (missing race data in 41 subjects).[‡] Total n = 913, STI positive n = 207 (missing contact status in 9 subjects).

Table 2

Factors Associated with a Repeat STI Test for Adolescent Women who Returned to the ED after Initial STI Testing (n = 315)

	No STI Test n = 174, n (%)	Repeat STI Test n = 141, n (%)	Univariate Analysis*		Final Multivariate Logistic Regression [†]	
			OR (95% CI)	P Value	OR (95% CI)	P Value
STI positive at Baseline	41 (23.6)	32 (22.7)	1.0 (0.6–1.6)	.856	1.5 (0.66–3.6)	.31
Black race [‡]	124 (77.5)	123 (89.1)	2.4 (1.2–4.6)	.008	2.3 (1.1–4.5)	.02
Age 18	58 (33.3)	70 (49.6)	2.0 (1.2–3.1)	.003	1.7 (1.05–2.8)	.03
Treated at initial ED visit	98 (56.3)	93 (65.9)	1.5 (0.9–2.4)	.08	1.1 (0.7–1.9)	.562
Contacted [§]	28 (16.4)	13 (9.4)	0.5 (0.3–1.1)	.07	0.28 (0.1–0.8)	.017

ED, Emergency department; STI, Sexually transmitted infection

* Chi-square test.

[†] Final logistic regression model, n = 292.

[‡] Total n = 298, (missing race data in 17 subjects).

[§] Total n = 309, (missing contact data in 6 subjects).