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Research Article

Evaluation and Cost Effectiveness of a Telephonic Intervention to Improve Chlamydia Rescreening among Adults

Brittany C Sanders[1], Theresa Wadas[2]* and A Edward Khan[3]

[1]Jefferson County Department of Health, USA
[2]Capstone College of Nursing, The University of Alabama, USA
[3]Jefferson County Department of Health, USA

Abbreviations: CDC: Centres for Disease Control; CT: Chlamydia Trachomatis; e.g.: Exempli Gratia; HIV: Human Immunodeficiency Virus; i.e.: Id Est.; NP: Nurse Practitioner; PID: Pelvic Inflammatory Disease; STI: Sexually Transmitted Infection; U.S.: United States

Abstract

Background: Despite the United States' recommendation for retesting after Chlamydia Trachomatis (CT) treatment, rescreening rates for CT remains low. The purpose of this study was to compare rescreening rates between routine care and a telephone intervention among CT treated adults and to assess cost effectiveness.

Objectives: To assess rescreening rates and cost effectiveness of a telephone intervention for CT rescreening among adults.

Method: CT treated participants were randomized to a control group (CGroup) or an intervention group (IGroup). The IGroup received telephone reminders at weeks 10, 11, and 12 following CT treatment. Medical records were reviewed at 10-14 weeks after initial CT treatment for rescreening rates. Cost effectiveness of the telephone intervention was evaluated by comparison of manual placed calls versus a telephone automation system.

Results: There were a total of 120 participants (60 per group). Rescreening rates were 6.67% (n=4) in the CGroup and 20% (n=12) in the IGroup. Rescreening rates were greater with the IGroup and statistically significant ($\rho = 0.03$), An automated telephone system was found to be more cost effective than use of a medical clerk manually placing calls.

Conclusion: Telephone intervention is effective for improving CT rescreening rates and cost effective with an automated system.

Keywords: Chlamydia Trachomatis; Chlamydia reinfection; Chlamydia rescreening; Chlamydia rescreening; Cost effectiveness

Introduction

Chlamydia Trachomatis (CT) is a sexually transmitted infection (STI) and is the most prevalent of all sexually transmitted diseases in the United States (U.S.) [1]. CT affects 105 million people worldwide and more than 1.5 million people in the U.S. annually [1,2]. CT infection is also associated with adverse outcome sequelae, particularly among young women. This adverse outcome sequela may include pelvic inflammatory disease (PID), ectopic pregnancy, tubal infertility, and chronic pelvic pain [1]. There are substantial medical costs associated with CT adverse outcomes sequela. For example, the cost of PID is approximately $2000 per patient in the U.S., which equates to $1.5 billion annually [3].

Repeat CT infections are common. The repeat infection rate, or new infection with a new organism, three months after treatment is 19.6% for women and 16.1% in men [4]. People treated successfully for CT are at increased risk of reinfections due to sex with new partners or sex with previous partners who have not been treated [1]. A study that examined if expedited partner therapy would affect recurrent and persistent STI, found that being female, being black, having multiple partners within the past sixty days, having a casual sexual partner, or having sex with someone they were unlikely to have sex with again increased factors that were associated with having untreated partners [5]. Because CT infection is often without symptoms, rescreening is required for the detection of CT reinfection or treatment failure. The risk of CT reinfection is greatest at 3-4 months after initial treatment and occurs in 11-15% of women [6]. Additionally, though current CT treatment guidelines with first line antibiotic regimens offer 97-98% microbial cure rates, treatment failure can occur, often indicating emerging antibiotic resistance within the community [6,7].

Since 2002, clinical guidelines in the U.S. recommend any person diagnosed with CT be retested within three months of treatment [1]. Despite this recommendation, CT rescreening rates remain low in U.S. primary care settings. Rescreening rates are 43% in Job Corps clinics, 15%-38% in STI clinics and 21%-25% in family planning clinics [8]. Reasons for low CT rescreening rates are varied, complexed, and involve organization, health care provider, and patient factors. A lack of organizational policies to prioritize testing (rescreening services), a lack of patients' understanding the importance of retesting, patients forgetting to return for retesting, and missed opportunities by clinic staff to rescreen for CT (in non STI clinic settings) has been identified as barriers to CT rescreening [9]. Fear of an invasive exam (i.e. a pelvic exam for women or urethral swabs for men) has been reported by males and females as a barrier to be rescreened after STI treatment [10,11]. Additionally, a lack of knowledge by the patient and providers about the need to be rescreened and patient's unwillingness to return for rescreening have also been found to influence CT retesting [8]. Lastly, patients not returning for rescreening for unspecified reasons has been identified as the most common barrier to CT retesting. Thus, CT rescreening interventions remains a multisystem challenge in primary care settings.

This challenge is particularly felt in public health departments in Alabama. Although CT rescreening is part of the treatment guidelines at public health departments in Alabama, there is no formal intervention to improve CT rescreening rates. This was the first study It write as This was the first study to examine an to examine an intervention of CT rescreening in a public health department in Alabama. The purpose of this study was to compare rescreening rates between routine care and

***Corresponding author:** Theresa Wadas, Capstone College of Nursing, University of Alabama, USA, Tel: 205-348-1032; Email: twadas@ua.edu

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a telephone intervention among adults who were treated for CT and to also assess cost effectiveness of the telephone intervention for CT rescreening.

The objectives of this study were to assess rescreening rates and cost effectiveness of a telephone intervention for CT rescreening among adults in a public health primary care setting.

Methods

Ethical issues

Permission to conduct this study was obtained from the facility's research board and the Institutional Review Board at the University of Alabama. The participants received no monetary compensation.

Setting

The CT rescreening telephonic intervention was implemented at a STI clinic within an inner city public health department in the southeastern U.S. The clinic employs five nurse practitioners and two registered nurses. The clinic's patient population includes persons aged 12 and older, both genders, all ethnicities and languages, and all sexual preferences. Although this clinic serves a variety of patients, and is open to all residents of the county and surrounding counties, the majority of the clinic's patients are African American. The clinic has an average of 100 CT infections monthly.

Identification of participants

Potential study participants were identified using an electronic generated list of patients who had tested positive for CT. All patients who were 19 years of age or older at the time of initial treatment, English speaking, non-pregnant, healthy, and had a phone were eligible to participate in this study. Individuals that were Human Immunodeficiency Virus (HIV) positive, pregnant, less than age 19 at the time of initial testing, incarcerated, participating in another CT study, or did not have a phone were excluded from the study. The study was conducted from October through December 2014.

Procedure

The medical records were manually reviewed for inclusion and exclusion criteria. One hundred and twenty patients were selected based on inclusion and exclusion criteria and randomized to either the Control (CGroup) or Intervention Group (IGroup). Patients in both groups were verbally informed by the Nurse Practitioner (NP) of the need to be rescreened three months after their initial CT treatment. The participants in the IGroup were contacted via telephone by the NP once a week during weeks 10, 11 and 12 following CT treatment. Participants who did not answer the phone or receive a voicemail (because mailbox was full or had not been set up) were contacted during the following week. When the NP spoke to the participant or left a voicemail, no additional calls were placed. Participants in the IGroup who were unable to be contacted via telephone or who did not return for rescreening during the study period were considered 'lost to follow up'. The medical records of both groups were reviewed during weeks 10-14 following treatment to determine whether they returned for CT rescreening. Cost analysis was performed by recording the amount of time the NP spent each week implementing phone calls to participants in the IGroup. Cost analysis was then performed using the salary for a medical clerk to manually place the calls and compared to a telephone automated system.

Data analysis

All study variables were analyzed using SPSS Version 21.0 [12]. Chi Square was used to assess categorical variables and two sample t-test was used for continuous variables. A power analysis was conducted to determine sample size with an 80% power and ($\rho < 0.05$) using G*Power [13]. A sample size of 120 participants was determined adequate to detect differences in rescreening rates.

Results

Characteristics of participants

In the overall group, there were 47.5% (n=57) males and 52.5% (n=63) females. In the CGroup, there were 43.3% (n=26) males and 56.7% (n=34) females. In the IGroup, there were 51.7% (n=31) males and 48.3% (n=29) females.

In the overall group, the mean age was 25 (± 5.9). In the overall group, the female mean age was 24 (± 4.9). In the overall group, the male mean age was 26 (± 6.7). In the CGroup, the overall age was 25 (± 6.4). In the CGroup, the female mean age was 24 (± 5.7) and the male mean age was 27 (± 6.4). In the IGroup, the overall age was 25 (± 5.4). In the IGroup, the female mean age was 24 (± 3.7) and the male mean age was 25 (± 6.6). There was no statistical significance in ages between the two groups ($\rho = 0.23$). There was no statistical significance in male ages between the two groups ($\rho = 0.24$). There was no statistical significance in female ages between the two groups ($\rho = 0.94$). Table 1 summarizes these characteristics.

Ct rescreening

Results of CT retesting revealed 6.67% (n=4) in the CGroup and 20% (n=12) in the IGroup returned for rescreening (Figure 1). The participants in the CGroup who returned for rescreening included three females (75%) and one male (25%). The mean age of those who returned for rescreening in the CGroup was 31 years (±8.9). The participants in the IGroup who returned for rescreening included 5 males (41.7%) and 7 females (58.3%). Five participants returned for reasons other than the telephonic intervention (sexual contact with someone with a positive test, returned prior to telephonic intervention, or were symptomatic at time of exam). The mean age of those who returned for rescreening in the IGroup was 26 years (± 8). A statistically significant finding was found between rescreening rates between the two groups ($\rho = 0.03$, phi = -0.196). Although statistically significant, the phi indicates a weak effect between the IGroup rescreening rate and the CGroup rescreening rate.

Cost analysis of telephone intervention

The NP documented three minutes per call and 2 minutes for call documentation in the medical record. The starting wage for a medical clerical is $12.78 an hour. If 100 patients were contacted via telephone each month (average number of positive Chlamydia tests) and each call lasted 3 minutes, 5 hours would be needed to complete all calls per month. An additional 2 minutes would be needed for each call, whether answered or unanswered, for documentation about the call in the patient's medical record, which equals a total of 3 hours and 20 minutes per month. If 25 calls are made each week, 2 hours 5 minutes would be spent by a medical clerk making and documenting calls. The cost of the calls would be $26.20 each week; $104.80 per month (4 weeks), or $1,362.35 per year. In contrast, if an automated telephone system were used, each call would cost 15.5 cents (4.5 cents per automated call and 11 cents to compensate clerks for time entering patient phone numbers

	Overall Group	Control Group	Intervention Group	P Value
Total Participants	120	60	60	
Male N (%*)	57 (48%)	26 (43%)	31 (52%)	
Mean Age Males (Mean, SD)	27 (±6.7)	27 (±6.4)	25 (±6.6)	0.24
Mean Age Female (Mean, SD*)	24 (±4.9)	24 (±5.7)	24 (±3.7)	0.94

% = percentage; SD = Standard Deviation

Table 1: Characteristics of participants.

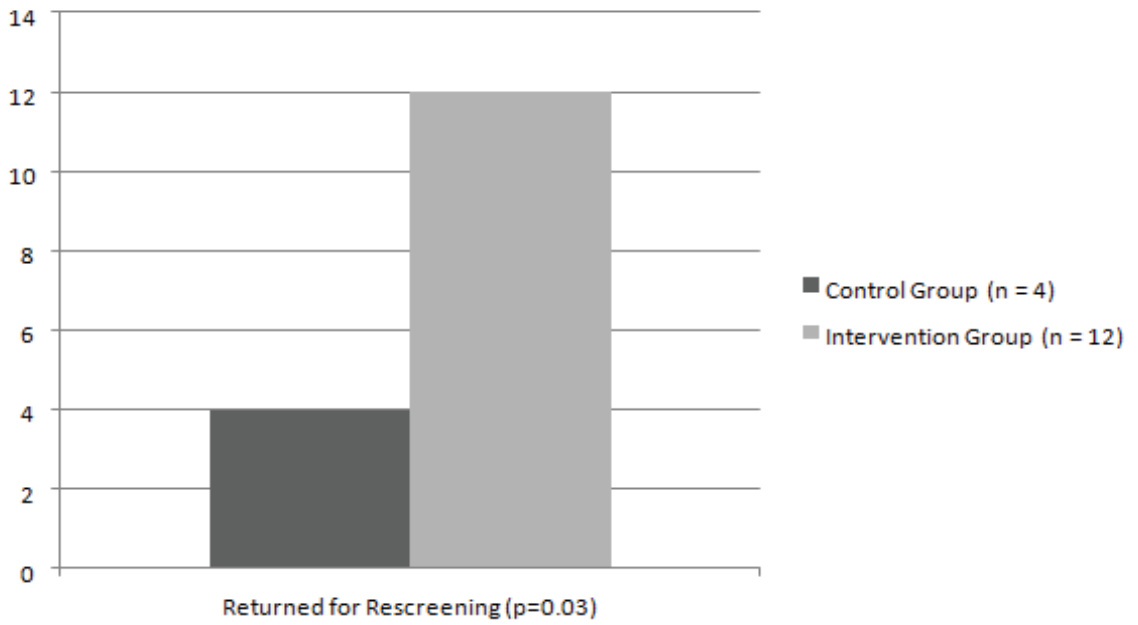

Figure 1: Rescreening Rates in the Intervention and Control Group (Actual Number).

Total Cost	Clerk	Automated System
Weekly	$26.20	$3.88
Monthly	$104.80	$15.50
Annually	$1,362.35	$186.00

*Based on 100 calls per month

Table 2: Comparison in cost between use of manual and automated system.

– approximately 30 seconds). The cost of calls would be $3.88 each week; $15.50 per month (4 weeks); $186 per year (Table 2).

Discussion

Our results indicate that the telephonic intervention was statistically significant and improved our CT rescreening rates among this population. The results were similar to previous studies of CT rescreening and the use of telephonic interventions. Guy et al. reported a 16% rescreening rate when telephonic or written intervention was used for CT rescreening [14]. Dockery et al. reported similar findings when a telephonic intervention was used among elderly without dementia (16%) [15]. Malotte et al. also demonstrated similar CT rescreening rates when a telephonic reminder was used with motivational interviewing or a $20 incentive (17.9%-29%, respectively) [16]. Similar to our findings, females under age twenty-five were more likely to return for rescreening in both the control and interventional groups. Our telephonic intervention was successful in this population because many of the participants were willing to return for rescreening when discussed on the phone. Some participants stated they didn't recall when they should be rescreened or if they should be rescreened, if asymptomatic. Although the telephonic intervention revealed improved CT rescreening rates, we may have had a higher percentage of participants to return for rescreening if appointments were scheduled during the telephone conversation.

The cost analysis revealed that use of telephone automation was more cost effective than a medical clerk manually placing these calls. While telephone automation was not studied in previous studies, our findings were similar to a cost effectiveness analysis of intervention conducted by Gift et al [17]. These investigators found that a telephone reminder system yielded the highest return rate (33%) and was the least costly in terms of cost per infection treated ($622 per program). Due to budget constraints of public health departments, this factor is an important consideration of sustainability for CT rescreening program.

Limitations

The study had methodological limitations. Incorrect phone numbers, disconnected numbers, patients not expecting to be contacted about rescreening, and misinformation by clinic staff regarding the intervention were limitations of the project. Another potential limitation was misinformation. Two patients who presented to the clinic for rescreening in the intervention group were told by those personnel that health department did not make phone calls about rescreening. It is not known how often this occurred and how many were actually affected by this misinformation. Generalizability is also a consideration. This study included only one public health clinic located in the southeast. Results, therefore, cannot be generalized to other clinics and their CT rescreening programs.

Conclusion

CT rescreening is a challenge for primary care providers. CDC recommends CT rescreening within three months of initial treatment. The purpose of this study was to increase the number of participants who returned to the clinic for rescreening and to determine the cost effectiveness of the telephone intervention for CT rescreening. The telephonic intervention successfully increased the CT rescreening rate. Although the telephonic intervention was a statistically significant improvement in the rescreening rates compared to the control group, further interventions to improve rescreening rates should be further investigated with this population. Cost to sustain the program should also be considered. Incorporating one or more evidenced based protocols to improve Chlamydia rescreening rates in primary care settings, ultimately, will emphasize the need for rescreening to providers, increase patient's knowledge about the need to return for rescreening, and improve rescreening rates.

Disclosure Policy

The authors declared that there is no conflict of interest with regard to publication of our research work published at GSL.

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References

1. Center for Disease Control and Prevention. 2016. 2015 Sexually transmitted diseases surveillance. Atlanta, GA. 1-156.
2. World Health Organization. 2012. Global incidence and prevalence of selected curable sexually transmitted diseases- 2008. World Health Organization, Geneva, Switzerland. 119.
3. Gradison M. 2012. Pelvic inflammatory disease. American Family Physician. 85: 791-796.
4. Peterman T, Tian L, Metcalf C, Satterwhite C, Malotte K, DeAugustine N, et al. 2006. High incidence of new sexually transmitted infections in the year following a sexually transmitted infection: A case for rescreening. Ann Intern Med. 145: 564-572.
5. Golden M, Schillinger J, Markowitz L, St Louis M. 2000. Duration of untreated genital infections with Chlamydia Trachomatis: A review of the literature. Sex Transm Dis. 27: 329-337.
6. Kong F, Tabrizi S, Law M, Vodstrcil L, Chen M, Fairley CK, et al. 2014. Azithromycin versus Doxycycline for the treatment of genital Chlamydia infection: A meta-analysis of randomized controlled trials. Clin Infect Dis. 59: 193-205.
7. Centers for Disease Control and Prevention. 2011. CDC grand rounds: Chlamydia prevention: Challenges and strategies for reducing disease burden and sequelae. Morbidity and Mortality Weekly Report. 60: 370-373.
8. Park I, Amey A, Creegan L, Barandas A, Bauer H. 2010. Retesting for repeat chlamydial infection: Family planning provider knowledge, attitudes, and practices. Journal of Women's Health. 19: 1139-1144.
9. Howard H, Barandas A, Steiner A, Bauer H. 2013. Increasing retesting for Chlamydia & Gonorrhea. BMC Infect Dis. 13: 239.
10. Spauwen L, Hoebe C, Brouwers E, Dukers-Muijrers N. 2011. Improving STD testing behavior among high-risk young adults by offering STD testing at a vocational school. BMC Public Health. 11: 750.
11. Sparks R, Helmers J, Handsfield H, Totten P, Holmes K, Wroblewski JK, et al. 2004. Rescreening for Gonorrhea and Chlamydial infection through the mail. Sex Transm Dis. 31: 113-116.
12. IBM SPSS Statistics 21.0. Author, New York.
13. Faul F, Erdfelder E, Lang AG & Buchner A. 2007. G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behav Res Methods. 39: 175-191.
14. Guy R, Hocking J, Low N, Ali H, Bauer H, Walker J, et al. 2012. Interventions to increase rescreening for repeat chlamydial infection. Sex Transm Dis. 39: 136-146.
15. Dockery F, Rajkumar C, Chapman C, Bulpitt C & Nicholl C. 2001. The effect of reminder calls on reducing non-attendance rates at care of the elderly clinics. Postgraduate Medical Journal. 77: 37-39.
16. Malotte C, Ledsky M, Hogben M, Larro M, Middlestadt S, St Lawrence JS, et al. 2004. Comparison of methods to increase repeat testing in persons treated for gonorrhea and/or Chlamydia at public sexually transmitted disease clinics. Sex Transm Dis. 31: 637-642.
17. Gift TL, Malotte K, Ledsky R, Hogben M, Middlestadt S, VanDevanter NL, et al. 2005. A cost effectiveness analysis of interventions to increase repeat testing in patients treated for gonorrhea or chlamydia at public sexually transmitted disease clinics. Sexually Transmitted Diseases. 32: 542-549.

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