Factors Associated with Repeat Visits among Clients Attending a Clinic for Sexually Transmitted Infections in Kisumu, Kenya

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Abstract

Purpose: To identify factors associated with repeat visits among patients attending a clinic for sexually transmitted infections (STIs) in Kisumu, Kenya.

Methods: Records of clinic visits were examined from March 2009 through May 2010. Multivariable logistic regression identified factors associated with repeat visits occurring > 30 days after the initial visit.

Results: Among 1,473 clients (1,296 single-visit individuals vs. 177 individuals with repeat visits), the median age was 24 years, 67% were male, and 8.6% self-reported being HIV positive. In adjusted analyses, men with repeat visits were more likely to report $\geq$ 2 recent sex partners (adjusted odds ratio (AOR) =1.60) and being HIV-positive (AOR=2.35). They were less likely to have been referred from other health facilities (AOR=0.14) and more likely to have urethral discharge at initial visit (AOR=2.46). Among women, repeat visits were associated with vaginal discharge (AOR=2.22), but attending the clinic with a partner was protective (AOR=0.38).

Conclusions: The association between sexual risk, HIV positivity and repeat visits among male clients highlights the need to focus intervention efforts on this group. For women, attending with a partner may reflect a decreased risk of re-infection if both partners are treated and counseled together.

Introduction

Sexually transmitted infections (STIs) account for a significant proportion of morbidity and health expenditures in East Africa [1-2]. Non-ulcerative STIs such as gonorrhea, chlamydia, and trichomoniasis, have been associated with adverse pregnancy outcomes, infertility, and increased risk of HIV acquisition and transmission [3]. Additionally, STIs impose a substantial economic burden among affected communities, particularly in developing countries where the majority of the population is under 40 years of age [3-4]. Despite recognition of adverse health outcomes and associated economic burden, STI surveillance in resource-poor settings remains limited [5].

Surveillance of STIs is necessary to assess the burden of disease within a community, in order to guide resources for intervention efforts and accurately monitor the effectiveness of interventions. Resource-poor settings often rely on syndromic management for diagnosing and treating STIs, due to limited access to diagnostic laboratory assays [1]. While syndromic management has been shown to be effective in managing symptomatic urethritis, epididymitis, and genital ulcerative diseases [6], it does not address infection in asymptomatic individuals, and has limited application in women with vaginal discharge or related symptoms. Using population survey data from South Africa, because most STIs are asymptomatic, the proportion of the annual number of curable STI episodes detected by syndromic treatment among men with urethral discharge was estimated at just 15% for gonorrhea and 12% for chlamydia [7]. Syndromic management did not reduce the prevalence of STIs over time at the community level [7].

Our objective was to determine the demographic, health history, and behavioral factors associated with repeat STI clinic visits. We used repeat visits as a proxy for newly acquired or re-acquired STIs. Characterizing the clinic population can provide a baseline to evaluate and

enhance prevention and treatment efforts. In addition, understanding factors associated with repeat clinic visits may assist in identifying those at high risk for re-infection, as these individuals may be core transmitters [8-10]. Targeting interventions to core transmitters may be a resource-efficient way to interrupt STI transmission [10].

Methods

Study Population and Setting

The Nyanza Reproductive Health Society (NRHS) has been conducting research and surveillance of sexually transmitted infections in the Nyanza province of Kenya since 2002. In 2006, NRHS established the Partners in Reproductive Health (PIRH) project to evaluate and treat clients and their partners for STI infections according to syndromic management guidelines, and to provide STI risk reduction counseling and HIV testing. This paper reports the results of a record-based retrospective cohort study consisting of clients seen at the PIRH clinic in Kisumu, Kenya, from March 2009 through May 2010. Analysis of these data was approved by the Institutional Review Board of the University of Illinois Chicago and the Kenyatta National Hospital/University of Nairobi Ethical Review Board.

Data Collection and Analysis

Demographic information, reason for visit, behavioral data, symptoms, physical examination findings, clinical diagnosis, and treatment provided, were collected using a standardized clinic form and entered into an electronic database. Demographic information, reason for visit, and behavioral data were reported by clients at the clinic. Information regarding current symptoms, physical examination findings, diagnosis, and treatment provided, were recorded by the treating

clinician. Available treatment options included acyclovir, azithromycin, benzathine, brufen, buscopan, cefixime, ceftriaxone, clotrimazole cream, clotrimazole pessary, doxycycline, erythromycin, fluconazole, metronidazole, norfloxacin, podophyllin, and spectinomycin. Beginning in February 2009, cefixime has been the first line treatment of urethritis and cervicitis in our clinic.

The period of observation was from March 1, 2009 through May 31, 2010. Entry into the cohort began with an initial visit to the PIRH clinic. The outcome for analysis was any repeat visit to the clinic, defined as a repeat visit that occurred greater than 30 days after the prior visit. Repeat visits that occurred $\leq$ 30 days after the prior visit were considered to be treatment follow-ups, and less likely to represent a "new" infection, and they were excluded from analysis.

Descriptive statistics were used to summarize demographic information, presenting illness, diagnosis and treatment. We used logistic regression to assess the association between repeat infections and characteristics at the initial visit. This involved 1,296 single-visit individuals and 177 individuals with first repeat visits (occurring >30 days after the initial visit). Variables with overlapping content (e.g., symptoms and examination findings) and associations in similar directions were collapsed in the regression model. Variables with a p-value < 0.20 in chi-square analysis were entered into logistic regression. Variables maintaining a p-value <0.10 in adjusted analyses are presented. Standard errors were estimated using a robust variance estimate. Models were run separately for men and women. Data were analyzed using SAS/STAT 9.2 for Windows (SAS Institute Inc., Cary, NC, USA).

Results

Study Population

Over the 15-month study period, there were 2,214 visits to the PIRH clinic. We excluded 103 (4.6%) visits with a reported prior visit date that occurred prior to the initiation of data collection (n=32), or prior visit dates that could not be verified in the database (n=71). From the remaining 2,111 visits, we excluded 14 visits with missing age, 161 initial visits that occurred within 30 days of the end of observation, and 11 visits where client identification numbers could not be verified. The remaining analyses include 1,925 visits (range 1-18 visits) made by 1,296 individuals. Of the 629 repeat visits, 452 occurred $\leq$ 30 days from the initial visit.

Overall, clients with early follow-up ($\leq$ 30 days from the initial visit) did not differ from those with repeat visit (> 30 days from initial visit) regarding gender, age, referral status, attending as individual vs. couple, or attending as a contact to someone with STI [results available from authors]. Men with repeat visit were more likely to be HIV-positive (14.3% vs. 7.5%, p=0.06), while the opposite was true for women (9.1% vs. 20.1%, p=0.04). Men with repeat visit were more likely to have multiple sex partners (24.3% vs. 3.8%, p<0.01), while there was no difference in number of sex partners for women. Men with repeat visit were more likely to diagnosed with urethritis (48.6% vs. 17.9%, p<0.01) or clinically herpetic GUD (15.9% vs. 7.9%, p=0.02), while women with repeat visit were more likely to be pregnant (16.9% vs. 7.5%, p=0.04) and diagnosed with vaginitis (63.2% vs. 24.8%, p<0.01).

Client Characteristics

Client characteristics are shown in Table 1. Overall, the mean age of clients was 24 years, and two-thirds of visits were made by male clients. By self-report, 8.6% of clients were HIV positive (7.6% of men and 10.7% of women, p=0.073). The proportion of men reporting 2 or more sex partners in the past 30 days was 15.9%, compared to 2.1% of women (p<0.001). Overall, 21.2%

of men were circumcised (by physical exam). The most common diagnosis in men was urethritis (45.8%) followed by balanitis/posthitis (12.6%) and clinically herpetic genital ulcer disease (GUD) (11.9%). In women, the most common diagnosis was vaginitis (53.4%), followed by cervicitis (9.4%), and PID (7.9%). Overall, 13.7% of women were indicated as having undergone a speculum examination, and 39.7% a bimanual examination.

Factors Associated with Repeat Visits

Having a repeat visit was not associated with sex or age (Table 2). Men with repeat visits were more likely to report two or more sex partners or no sex partners in the past 30 days than one sex partner (18.0% and 16.8% vs. 8.0%, respectively, p=0.001). Men with repeat visits were more likely to report being HIV-positive than those with single visits (14.3% vs. 6.3%, p=0.008). Being referred to the clinic was less common among men with repeat visits than among men with single visits (2.0% vs. 14.7%, p=0.002). Men with repeat visits had a higher prevalence of urethral discharge in the past 6 months compared to men with single visit (11.4% vs. 4.2%, p=0.002). There was no difference between men with single visits compared to those with repeat visits with respect to receiving any pharmacological treatment, attending individually or with a partner, symptoms of GUD, genital warts or dysuria, diagnosis of urethritis GUD or balanoposthitis, and circumcision status.

Women with repeat visits did not differ from those with single visits with regard to type of session (individual or couples attendance), self-reported HIV status, or symptoms of vaginal discharge, genital warts, genital itching or dysuria. Women with repeat visits had a slightly higher prevalence of zero sex partners in the past 30 days than 1 or more sex partners (p=0.079). As with men, being referred to the clinic was less common among women with repeat visits than

those with a single visit (4.5% vs. 23%, p=0.002). Compared to women with single visits, those with repeat visits were less likely to have received STI-specific antibiotic regimens at their initial visit: cefixime (11% vs. 36%, p=0.001), doxycycline (15.7% vs. 33.6%, p=0.003), metronidazole (13% vs. 25%, p=0.030). Additionally, diagnoses of cervicitis and pelvic inflammatory disease (PID) were significantly less common among women with repeat visits than women with single visits.

Results of Logistic Regression Analysis

In multivariable logistic regression analysis, we identified statistically significant factors associated with repeat visits among men (Table 3): urethral discharge symptoms in the past six months [adjusted odds ratio (AOR)=2.46; 95% CI: 1.20 – 5.05]; and self-reported HIV positivity [AOR=2.35; 95% CI: 1.20 – 4.62]. Having two or more reported sex partners in the past 30 days had an AOR of 1.60 for repeat visit and was marginally statistically significant [95% CI: 0.97 – 2.65]. Having been referred to the clinic was protective [AOR=0.14; 95% CI: 0.01 – 0.46]. In women (Table 4), statistically significant protective factors in multivariable logistic regression were attending the clinic with a partner [AOR=0.38; 95% CI: 0.17 – 0.88] and diagnosis of cervicitis or PID [AOR=0.30; 95% CI: 0.10 – 0.91]. Women with vaginal discharge by history or exam were more likely to have a repeat visit, with an adjusted OR of 2.22 [95% CI: 1.28 – 3.86]. Women with GUD by history, exam, or diagnosis were less likely to have a repeat visit, but this was marginally statistically significant [AOR=0.27; 95% CI: 0.06 – 1.21].

Discussion

We identified a significant number of repeat visits (12% of all visits) among clients at our STI clinic in Kisumu, Kenya. In men, a repeat visit appeared to be more common among high risk men: those with multiple sex partners, pathognomonic STI symptoms and signs, and HIV positivity. In women, repeat visits appeared to be prevented by attending the clinic with a male partner, and by having a syndromic diagnosis (cervicitis, PID, GUD) that was associated with a specific treatment regimen.

Women with vaginal discharge at the initial visit, a syndrome with a broad differential treatment plan, and which is generally associated with a variety of vaginal infectious agents, was associated with an increased likelihood of return to the clinic. This is not unexpected, as the sensitivity of vaginal discharge in syndromic management algorithms ranges from 30-60%, depending on the relative prevalences of bacterial vaginosis, trichomonas, gonorrhea, and chlamydia [11-14]. While syndromic management has shown effectiveness in managing urethritis, epididymitis, and GUD [6], it does not result in population level declines in STI prevalence due to the high prevalence of undetected infections [15-17]. In Nyanza province of Kenya, 96% of health facilities rely primarily on syndromic management, while just 42% have any etiologic testing capabilities (37% with capabilities for syphilis detection, 20% for gonorrhea, 1% for chlamydia; not inclusive or mutually exclusive), and these capabilities are often rudimentary; for Kenya as a whole, 79% of health facilities rely on syndromic management, with 53% having some basic etiologic testing capabilities [18]. Effective population approaches to STI control will require active screening. With limited etiologic testing facilities and resources, this may be most efficiently achieved through targeting screening to core transmitters and through partner treatment. Although this approach has not been well studied in Kenya, a before-and-after study of patients treated for STDs in 5 primary health clinics in

Nairobi showed that implementation of brief counseling on the importance of partner treatment increased partner follow-up from 15% to 39% [19].

Women diagnosed with cervicitis or PID, diagnoses based largely on speculum and bimanual examination, were less likely to have a repeat visit. Conversely, women with findings of vaginal discharge were more likely to return to clinic. Repeat visits in women could represent treatment failure or an incorrect initial treatment regimen. This suggests that speculum examination and bimanual examination may have led to more effective care in women, through improved syndrome identification. Additionally, while cervicitis was a small proportion of overall visits, our use of cefixime may have contributed to the lower odds of repeat visit among women with cervicitis at initial visit. In a previous study of our STI clinic clients, culture positive gonococcal isolates from 2008 showed a high prevalence (16%) of quinolone resistance [20].

Limitations

While we excluded visits occurring $\leq$ 30 days after the initial visit, visits that occurred > 30 days after the initial visit may have occurred for reasons other than "new" STI symptoms. As with visits occurring soon after the initial visit, these visits may represent delayed follow-up or treatment failure. Men with early follow-up may have lower risk for STI (fewer multiple sex partners, lower self-reported HIV prevalence, less likely to have urethritis or clinically herpetic diagnosis). Women with early follow-up were less likely to have a vaginitis diagnosis at the initial visit, and thus may have had more effective initial treatment or no need for additional follow-up. Thus focusing on individuals with follow-up > 30 days from the initial visit seems to appropriately target higher risk men and women with potentially less efficacious initial treatment. Our analysis was not able to account for individuals who acquired infection prior to

their first recorded visit, and some one-time visits in our database may have been repeat visits. There also may have been clients who had a re-infection but did not revisit our clinic.

The majority of the variables used in our analysis were symptoms, or treatments used to represent STI infections. A variable, or combinations of variables, could be used to represent the same infection. While examination of variance inflation factors showed that the covariates exhibited no significant collinearity, associations between the variables may have accounted for larger standard errors and confidence intervals. Due to the nature of the variables, the results of analysis may not be reflective of specific predictors of *re-infection*, but could reflect treatment failure or initial misdiagnosis.

Conclusions

In our STI clinic, men with repeat visits may identify a group of core transmitters: multiple recent sex partners, repeat STIs, and HIV positivity. Targeting them for STI intervention services may be a resource-efficient approach to STI control. The results of our analysis provide the basis for programmatic actions: stressing with clinicians and clients the importance of partner treatment and risk reduction counseling; and training clinicians to regularly perform bimanual and speculum examinations because they are associated with improved client outcomes, as indicated by reduced repeat visits in women.

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Table 1. Client Characteristics, March 2009 through May 2010.

	Overall, N=1,473 n (%)
Median Age (years)	
Men	24.0
Women	22.0
Gender	
Male	993 (67.4)
Female	480 (32.6)
Number of sex partners in the past 30 days	
Men	
None	205 (20.7)
One	627 (63.4)
2 or more	157 (15.9)
Women	
None	132 (27.7)
One	334 (70.2)
2 or more	10 (2.1)
Self-Reported HIV positive	
Men	59 (7.6)
Women	43 (10.7)
Men: Circumcised?	
Yes	207 (21.2)
Diagnoses in men*	
Urethritis	452 (45.8)
Non-herpetic GUD	43 (5.1)
GUD herpetic	117 (11.9)
Balanitis/posthitis	124 (12.6)
Any diagnosis^	865 (87.5)
Speculum Exam	
Yes	58 (13.7)
No	367 (86.4)
Bimanual Exam	
Yes	177 (39.7)
No	269 (60.3)
Diagnoses in women	
Vaginitis	245 (53.4)
Cervicitis	43 (9.4)
PID	36 (7.9)
Non-Herpetic GUD	9 (2.0)
GUD herpetic	21 (4.6)
Any diagnosis^	418 (90.7)

Not all cells sum to N due to missing data.
GUD = Genital ulcer disease; PID = Pelvic inflammatory disease
*Diagnostic categories are not mutually exclusive (i.e., some individuals had multiple diagnoses). Proportions are calculated by gender (i.e., for diagnoses in men, number of men is the denominator).
^ Not all diagnoses listed.

Table 2. Factors Associated with Repeat Visits: Results of Chi-squared analyses.

Variable^	Had a repeat visit, N=177 n (%)	Did not have a repeat visit, N=1296 n (%)	Chi-square P-value
Sex			
Female	70 (14.6)	410 (85.4)	
Male	107 (10.8)	886 (89.2)	0.495
Median age in years*			
Men	24.0	24.0	0.246
Women	22.0	22.0	0.333
Referred to come to clinic			
Men: Yes	2 (1.9)	104 (11.7)	0.001
Women: Yes	3 (4.3)	75 (18.3)	0.002
Type of session: Individual (vs. Couple)			
Men: Individual	102 (95.3)	801 (93.4)	0.433
Women: Individual	62 (88.6)	286 (73.0)	0.007
Attending clinic as contact to someone with STI			
Men: Yes	4 (3.9)	32 (3.9)	0.999
Women: Yes	7 (10.3)	75 (20.4)	0.062
Self-Reported HIV-Status			
Men: Self-reported HIV positive	12 (14.3)	42 (6.3)	0.008
Women: Self-reported HIV positive	6 (9.1)	35 (10.6)	0.712
Number of sex partners, past 30 days			
Men			
None	30 (28.0)	175 (19.8)	0.001
One	51 (47.7)	576 (65.3)	
Two or more	26 (24.3)	131 (14.9)	
Women			
None	26 (37.1)	106 (26.1)	0.101
One	44 (62.9)	290 (71.4)	
Two or more	0 (0.0)	10 (2.5)	
Symptoms and Exam Findings in Men			
Current Urethral Discharge, by history or exam	41 (38.2)	358 (40.5)	0.671
Urethral discharge past 6 months	12 (11.4)	34 (3.9)	0.001
Dysuria	52 (49.1)	395 (44.7)	0.398
Genital Ulcer, history or exam	22 (20.6)	168 (19.0)	0.695
Balanitis	3 (2.8)	67 (7.7)	0.072
Circumcised	18 (16.8)	189 (21.7)	0.244
Diagnoses in men			
Urethritis	52 (48.6)	400 (45.4)	0.531
GUD: Clinically herpetic	17 (15.9)	100 (11.4)	0.180
GUD: Clinically non-herpetic	3 (3.0)	40 (5.4)	0.324
Balanitis, posthitis	10 (9.4)	114 (13.0)	0.279
Pharmacologic Treatment in Men			
Cefixime	47 (44.8)	382 (43.5)	0.799
Doxycycline	48 (45.3)	402 (46.3)	0.841
Metronidazole	3 (2.8)	30 (3.5)	1.000
Symptoms in women			

Genital ulcer	2 (2.0)	43 (10.6)	0.060
Lower abdominal pain	13 (18.8)	113 (28.5)	0.099
Women: Pregnant or suspected pregnant	11 (16.9)	29 (7.8)	0.022
Diagnoses in women			
Vaginitis	43 (63.2)	202 (51.7)	0.077
Cervicitis	3 (4.4)	40 (10.2)	0.129
Pelvic inflammatory disease	2 (3.0)	34 (8.7)	0.113
GUD: Clinically herpetic	1 (1.5)	20 (5.1)	0.202
GUD: Clinically non-herpetic	1 (1.6)	8 (2.1)	0.789
Pharmacologic Treatment in Women			
Cefixime	8 (11.4)	144 (36.0)	0.001
Doxycycline	11 (15.7)	135 (33.6)	0.003
Metronidazole	9 (13.0)	101 (25.0)	0.030

Not all cells sum to N due to missing responses. ^ All findings refer to initial visit, except completed prior treatment.
*Median age compared between groups by Wilcoxon rank sum test.
Fisher's exact test used where cell size $\leq$ 5.

Table 3. Results of Univariate and Multivariate Logistic Regression: Factors Associated with Repeat Visits in Male Clients.

Variable	Unadjusted Odds Ratio [95% CI], p-value	Adjusted Odds Ratio, n=952 [95% CI], p-value
Referral to clinic	0.12 [0.03-0.48], 0.028	0.14 [0.03-0.59], 0.008
Urethral Discharge in Past 6 Months	3.20 [1.60-6.39], 0.001	2.46 [1.20-5.05], 0.014
Two or more partners in past 30 days	1.75 [1.08-2.82], 0.021	1.60 [0.97-2.65], 0.067
Self-reported HIV Positive	2.49 [1.26-4.95], 0.008	2.35 [1.20-4.62], 0.013
No Sex in past 30 days	1.74 [1.11-2.75], 0.016	
One Partner in past 30 days	0.21 [0.09-0.49], 0.003	

Table 4. Results of Univariate and Multivariate Logistic Regression: Factors Associated with Repeat Visits in Female Clients

Variable	Unadjusted Odds Ratio [95% CI], p-value	Adjusted Odds Ratio, n=428 [95% CI], p-value
Session: Couple vs. Individual	0.37 [0.17 – 0.80], 0.012	0.38 [0.17 – 0.88], 0.024
Vaginal discharge (by history, examination)	2.07 [1.23 – 3.49], 0.006	2.22 [1.28 – 3.86], 0.005
Genital ulcer (by history, examination, or diagnosis)	0.27 [0.06 – 1.13], 0.072	0.27 [0.06 – 1.21], 0.088
Cervicitis or PID Diagnosis	0.38 [0.15 – 0.99], 0.049	0.30 [0.10 – 0.91], 0.033
Treatment with Cefixime and/or Doxycycline	0.38 [0.20 – 0.74], 0.004	
Referral to Clinic	0.20 [0.06 – 0.66], 0.008	
Pregnant or suspected pregnant	2.52 [1.18 – 5.36], 0.018	
Attending clinic as contact to someone with STI diagnosis	2.23 [0.98 – 5.08], 0.056	
Genital itching symptom	1.63 [0.97 – 2.74], 0.064	
Vaginitis Diagnosis	1.61 [0.95 – 2.74], 0.080	
Treatment with metronidazole	0.52 [0.25 – 1.09], 0.084	

CI = Confidence Interval; PID = Pelvic Inflammatory Disease
Adjusted model is adjusted for all variables presented.