
Assisted Partner Services (APS) among Patients Attending HIV Comprehensive Care Clinic in Kenya: Randomized Controlled Trial (RCT)

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Abstract

Introduction: Assisted Partner Services (APS) for HIV involves interviewing HIV infected individuals about their sexual partners and then locating these partners to offer HIV testing and inform them about the exposure. Several studies have shown APS to be effective and acceptable among newly diagnosed individuals, however few have studied APS among individuals with chronic HIV infection.

Methods: HIV-infected individuals receiving care at Kenyatta National Hospital Comprehensive Care Center (CCC) were randomized to community versus health facility based notification. Index case in the Health facility arm were offered standard of care which is contract testing where they were encouraged to bring their partners for testing. In the community arm which was the intervention arm, the index cases were offered immediate assisted partner notification where health advisers consented the index cases for their partners to be confidentially contacted and tested for HIV. Smart phone tablet with a Open Data Kit questionnaire was used to collect data. The two approaches were compared using the ODDS Ratio with 95% confidence intervals and the results given below.

Results: Index cases randomized to health facility arm were 201 while 218 index cases in the community arm of whom 262 (62.5%) were women and majority aged between 40-49 years 87

(39.9%). The community based assisted partner notification yielded 1 partner per index and among these 113 partners were traced (51.8%) and 101 partners were HIV tested (89.3%). Of those tested, 35 of 101 were HIV-positive. When compared to facility passive referral, there was a 2.6-fold increase in partner testing with 58 (28.9%) of 201 testing for HIV in the health facility arm (Odds ratio [OR] 2.65; 95% confidence interval [CI]: 1.77, 3.98 $p < 0.001$).

Discussion or conclusion: Community based partner tracing has high potential of reaching HIV exposed partners of a HIV infected index case. It is acceptable to both index cases and their partners and enables health workers provide services that enable partners to be enrolled into care.

Keywords: Randomized trial, community, health facility, assisted partner services, HIV, Kenya

Introduction

HIV partner services refers to a voluntary process whereby a person diagnosed with an HIV-infection is encouraged to disclose their status to their partner(s) and offered assistance from a health worker to confidentially contact his or her sexual partner(s) and offer them voluntary HIV testing services¹. The following are examples of partner notification services; Passive referral – when an HIV-positive person is encouraged to disclose their status to their partner(s) and encourage them to get tested for HIV; Provider referral—when a health worker confidentially notifies the partner(s) with the direct permission of their HIV-positive client; Contract referral – when an HIV-positive person is encouraged to disclose their status to their partner(s) and encourage them to get HIV testing. If the partner does not get tested by a certain date, a health worker confidentially contacts the partners directly.

Globally, HIV surveillance and partner services has been used in the US to describe HIV infection among US immigrant communities² using CDC guidelines. This results to greater uptake of care and treatment as well as viral suppression as reported in King County in Washington in 2013⁶.

In Africa HIV partner services have been tried in Cameroon and Malawi with different levels of success. In a Malawi study, only 11% refused provider based partner services. Additionally the community or home-based partner services was found to be cost-effective³.

In Kenya and in other developing countries, prevention with positives and concentrating on following "where the virus is" strategy is being tried. HIV transmission ultimately occur between sero-discordant partners and there is pre-exposure prophylaxis (PrEP) which can reduce HIV acquisition among high risk populations⁴. HIV partner services is thought to be an intervention that can be used by health services to reach exposed individuals for counseling and testing while enrolling traced partners into HIV care and treatment. Majority of HIV infection is suspected to take place when HIV infected partner does not know his/her status because the risk of transmission without precautionary measures is high⁵.

HIV prevention is increasingly focused on ensuring that infected persons are diagnosed soon after HIV acquisition and quickly linked to care and initiated on anti retroviral therapy. HIV

partner services can achieve this for partners of a HIV positive patient. Previous studies on assisted partner services have been in voluntary counseling and testing as compared to comprehensive care centers where patients with HIV receive care and treatment. This study was carried out in a CCC and index cases were patients already in care and treatment.

Methods

Design: The study was a randomized controlled trial (RCT) in which patients attending a HIV comprehensive care clinic in Nairobi, Kenya were randomized to receive APS at community level versus at facility level. Community arm involved consenting index case to trace partners after contacting them on phone while in health facility arm index case was asked to bring their partners to the health facility. The study investigated the proportion of partners that were traced in each arm and the willingness of those partners to get tested and compared numbers of HIV positive and sero discordant couples in each arm and numbers needed to interview to get a HIV infected case.

Recruitment and enrolment: Patients attending the Comprehensive Care Centre (CCC) for HIV care at Kenyatta National Hospital (KNH) were screened into the study throughout 2015. The index cases were consented to participate in the study after being explained about the study procedures. A written informed consent was given and both men and women who were known HIV positive, 18 years and older, and willing to name sex partners and have them contacted anonymously for HIV testing were enrolled to the study. Pregnant women, and men and women who reported intimate partner violence in last month were excluded from the study.

Study procedures: Study subjects were randomized to either receive community based partner notification, which consisted of a health worker visiting their partners in the community, or health facility notification where partner was invited to the facility by their index for HIV testing. The index cases were randomized using computer generated numbers which were generated by a biostatistician and placed in an opaque envelope which a research assistant opened while doing simple random allocation. Partners were traced in the community using a phone number contact provided by the index case and an appointment made for time and place for a meeting. Smart phone tablet with a Open Data Kit questionnaire was used to collect data. There was no blinding of either the participants nor the research assistants. The community arm was compared to facility arm where index case was encouraged to bring their partners for testing and which is the standard of care in Kenya. Socio-demographic data on gender, age, marital status and occupation was collected using a research assistant administered questionnaire. Sexual history was collected from both the index cases and their partners as well as clinical data on HIV care. The partners that were traced gave informed consent to participate in the study and then underwent voluntary counseling and testing for HIV. Index cases were followed up to six weeks after recruitment for any experience of intimate partner violence (IPV). Any patients who experienced IPV were referred to the hospital gender-based violence recovery centre.

Sample size: The sample size was calculated with power to detect a 30% difference in HIV testing uptake between index patients partners randomized to community arm versus health

facility arm. The primary outcome of the study was successful tracing of partners and informing them of HIV exposure. The secondary outcome was uptake of HIV testing by partners.

Data analysis: Descriptive and inferential statistics were used including chi square, t-test to test association of HIV status of partners with index case characteristics and also their sexual history. Statistical significance was set at an alpha of 0.05. Logistic regression models were used to test the model of predictor of contacting a sexual partner. Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated. The outcome of interest was the binary outcome of any partner of the index being contacted. All analyses were conducted using Stata 13.0.

Human subject procedures: The study was approved by Kenyatta National Hospital/University of Nairobi scientific and ethics committee and University of Washington. All study participants and contacted partners provided written informed consents in English or Kiswahili.

Results

Study population and baseline characteristics: A total of 474 patients were screened in the outpatient reception area of the HIV comprehensive care clinic in KNH, Kenya. Forty nine (10.3%) patients declined to participate or had high risk of intimate partner violence or pregnant and were excluded from the study. The remaining 425 patients were included in the study though 1 in the intervention arm and 5 in the control arm were lost to follow-up and thus excluded from analysis. The remaining 218 in experimental arm and 201 in control arm were subjected to analysis (Figure 1).

Women comprised 63.1% of participants and the mean age was 40.4 years with standard deviation of 8.74 while the median age was 40 years. Among the participants 326 (77.8%) were married monogamous. The respondents were mainly self-employed 261 (62.3%). Electricity was available 408 (97.3%) of respondents while only 298 (71.1%) had tap water in their house-holds. Index cases that were eligible for ARVs were 352 (86.5%) but those who were on ARVs were 317 (75.7%). The index cases that had been done CD4 test were 385 (91.9%) while those with viral-load test results were 203 (48.5%). In sexual history, participants who reported a live-in sexual partner were 355 (84.7%) with the mean lifetime partners being 4.9 ± 2.9 while 196 (46.8%) more than 5 life-time partners. The respondents who reported using condom during the last sexual encounter were 319 (76.1%). The participants who had given money for sex were 57(13.6%) while those who had received money for sex were 79 (18.9%). Majority of index cases did not know the HIV status of their partners 384 (91.6%). All index cases were confirmed HIV positive. The respondents who reported that their financial situation was stable were 243 (58.0%), had stable place to live were 405 (96.7%) and 367 (87.6%) had children. There was no difference in baseline characteristics depending on randomization arm suggesting a successful randomization (Table 1).

Identification of partners and acceptance of HIV testing by arm: More partners 113 (51.8%) were traced in the intervention arm compared to the control 58 (28.9%). The test of hypothesis

that there is no difference in proportion of partners traced between community intervention arm and health facility arm was rejected at $p < 0.001$ (Table 2). There was nearly 3 folds increase in probability of tracing a partner in the community arm as compared to health facility standard of care approach.

Correlates of partner tracing: Factors affecting uptake of partner notification in community versus facility scenario which were correlates of partner tracing included age where it was more likely to trace partners of older index cases compared to the younger ones with those greater than 50 years having nearly 4 folds increase in likelihood of being able to trace their partners (Table 3). The gender of the index case was also a correlate of partner tracing with male index cases having nearly 2 times likelihood of their partner being traced. Having children also increased likelihood of a partner being traced. The index cases who had their viral load test done as part of their management had OR = 0.65 likelihood of their partners being traced.

HIV testing outcomes by arm: Of the partners traced 160 (94%) consented to be tested of whom 53% were men with 34.5% of the partners traced testing HIV positive. The positivity rate was 39 (34.5%) for community arm and 20 (34.4%) for health facility arm. Number needed to interview (NNTI) to get a HIV positive result were 5.6 for community arm and 10.0 for the health facility arm.

Discussion

The study demonstrated that assisted partner notification for HIV among patients in chronic care for HIV is an effective intervention that increases tracing and testing of partners of HIV infected index cases. This finding was similar to that by Cherutich *et al* in a surveillance of HIV study where he concluded that APS is an effective measure of targeted HIV testing that aims at increasing yield for case detection⁷. Tracing of partners in the community yields more cases as compared to passive health facility tracing as shown by number needed to test to get a positive result. There was high uptake of partner services as opposed to the hypothesized refusal of partners to be tested before onset of the study.

The study enrolled more women as index cases than men which is due to more women being in HIV care and treatment. This was similar to a partners study where there was preponderance of women in the clinics and discordant partners who are critical target for new prevention intervention⁸. Majority of the participants marital status was married monogamous suggesting that the HIV infection is still most prevalent in persons in formal marital status. This is similar to the study on HIV risk factors which showed that most recent HIV infection was among persons who were married (87.3%), persons never tested (63.5%) and those who believed that they were HIV negative (35.3%)⁹.

Most index cases indicated that they did not know the HIV status of their partners despite most having been enrolled in the care and treatment for a long period of time. This suggests that disclosure of HIV status is not happening among patients in chronic care and thus new approaches and resources are required to reinvigorate HIV prevention efforts¹⁰. It is also similar with finding of a surveillance study where as little as one tenth (15.3%) HIV infected patients

tested with their sexual partners.⁷ The use of condoms among the couples was high most likely due to suggestion of the index case already in care and treatment. This is similar to findings of meta analysis study which found prevalence of high risk sexual behavior was reduced after people became aware of HIV (+) status¹¹. More partners traced were men suggesting that many men are being missed for HIV testing even when they are exposed. Willingness of contacted partners to be tested was high, probably because they realized the seriousness of the disease condition they have been exposed to. The number of index cases needed to interview to get a positive partner is less than one in ten which is in line with the fact that only persons with HIV which is a small population than those at risk can transmit the virus¹⁰. The partners had high HIV sero-positivity compared to normal population which is similar to findings of a discordant study which showed 1.5 per 100 persons sero conversion for HIV-1¹². The efforts made by health advisers to contact partners in the community arm yielded higher proportion of partners traced and is thought to be economically viable and cost effective. This is similar to findings of a study predicting partner HIV test where provider assisted methods of partner notification was noted to be cost-effective and increased testing and counseling among sexual partners of patients diagnosed with HIV¹³. This shows that it is possible to trace partners of index cases receiving care and treatment in clinics across Kenya and possibly the rest of the world. Partner Notification was acceptable to both index cases and their partners.

The study had limitation in that there was uncertainty about the response of partners who were traced in the community and their willingness to get tested. This meant that health advisers required special skills to do community notification which they were trained for. The environment where the test was done was not controlled and a health counselor had to create enabling environment for testing. The study was not able to follow partners testing positive for link to care and treatment though linkage to care was discussed during counseling. The index cases depicted unwillingness to inform their partner in contract referral and were most in favor for health counsellors to inform their partners. This study was not able to put discordant partners on PrEP as recommended that high risk individuals should be considered for PrEP¹⁴.

Conclusion

Partner notification of HIV exposure is a feasible, innovative and novel method of tracing population at high risk of HIV infection. Partner notification is a opportunity to stop the chain of HIV infection among partners who are in a union with a patient already known to be HIV positive. Number needed to test to find a HIV positive was less in the community arm compared to health facility arm.

Authors' contribution

HK conceptualized the study, analyzed the data and drafted the manuscript. DB, MP, FAO, PM and CF reviewed the manuscript. HK, PM managed the database. HM & CF had final responsibility for submission for publication.

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Table 1: Socio-Demographic characteristics of HIV-infected Comprehensive care centre participants

	Intervention (Community partner tracing) N=218	Control (Health-facility partner tracing) N=201
	n (%) or median (inter-quartile range)	n (%)
<i>Demographic characteristics</i>		
Age		
20-29	15 (6.9)	25 (12.4)
30-39	83 (38.1)	72 (35.8)

40-49	87 (39.9)	80 (39.8)
>50	33 (15.1)	24 (11.9)
Gender		
Female	133 (61.0)	129 (64.2)
Male	85 (39.0)	72 (35.8)
Marital Status		
Single or widowed	42 (19.3)	46 (22.9)
Married Monogamous	173 (79.4)	153 (76.1)
Married polygamous	3 (1.4)	2 (1.0)
Occupation		
Unemployed	17 (7.8)	11 (5.5)
Formally employed	66 (30.3)	64 (31.8)
Self-employed	135 (61.9)	126 (62.7)
Has electricity	215 (98.6)	193 (96.0)
Has running water	152 (69.7)	146 (72.6)
<i>Clinical Characteristics</i>		
Index on ARV	163 (74.7)	154 (76.6)
Index Eligible for ARV	183 (86.3)	169 (86.7)
Ever took Septrin	189 (86.7)	176 (87.6)
Done CD4 count	200 (91.7)	185(92.0)
Done Viral Load	112 (51.4)	91 (45.3)
<i>Sexual Behavior</i>		
Live-In Partner	186 (85.3)	169(84.1)
Lifetime sex partners ¹		
<5	119 (54.6)	104 (51.7)

5+	99(45.4)	97(48.3)
Used condom at last sex	174 (79.8)	145 (72.1)
Ever given money for sex	43 (19.7)	36 (17.9)
Ever received money for sex	30 (13.8)	27 (13.4)
<i>Economic factors</i>		
Financial situation stable	126 (57.8)	117 (58.2)
Stable place to live	214 (98.2)	191 (95.0)
Have children	197 (90.4)	170 (84.6)

Table 2: Association between intervention and tracing a partner

	Community		Facility		OR (95% CI)	p value
	#/total	(%)	#/total	(%)		
Partner Traced	113/218	(51.8)	58/201	(28.9)	2.65 (1.77, 3.98)	<0.001

Table 3: Index client characteristic correlates of tracing a partner

	At least a Sexual partner traced n=171	No Partner traced n=248	OR (95% CI)	p-value
<i>Demographic factors</i>				
Age				
20-29(ref)	10 (5.9)	30 (12.1)	1.0	
30-39	69 (40.3)	86 (34.7)	2.41 (1.11,5.20)	

40-49	60 (35.1)	107 (43.2)	1.68 (0.77,3.67)	<0.01
>50	32 (18.7)	25 (10.0)	3.84 (1.61, 9.17)	
Gender: Female(ref)	94 (55.0)	168 (67.7)	1.0	<0.01
Male	77 (45.0)	80 (32.3)	1.72 (1.15, 2.57)	
<i>Marital Status</i>				
Single (ref)	38 (22.2)	50 (20.2)	1.0	0.17
Married Monogamous	129 (75.5)	197 (79.4)	0.87 (0.53, 1.39)	
Polygamous	4 (2.3)	1 (0.4)	5.26 (0.69, 2.86)	
Has electricity	169 (98.8)	239 (96.4)	3.18 (0.73, 13.81)	0.12
Has running water	126 (73.7)	172 (69.4)	1.23 (0.80, 1.91)	0.34
Has children	157 (91.8)	210 (84.7)	2.03 (1.07, 3.84)	0.03
<i>Sexual Behavior</i>				
Live-In Partner	143 (83.6)	212 (85.5)	0.87 (0.51, 1.49)	0.604
Lifetime sex partners				
<5 (ref)	92 (53.8)	131 (52.8)	1.0	0.248
5+	79 (46.2)	117 (47.2)	0.96 (0.65, 1.42)	
Used condom at last sex ²	128 (74.9)	191 (77.0)	0.89 (0.56, 1.40)	0.610
Don't know partner HIV status	156 (91.2)	228 (91.9)	0.73 (0.35, 1.52)	0.174
<i>Clinical Characteristics</i>				
Done CD4 count	158 (92.4)	227 (91.5)	1.12 (0.55, 2.31)	0.750
Done Viral Load	84 (49.1)	119 (47.9)	0.65 (0.38, 1.11)	0.041
On ARVs	124 (72.5)	193 (77.8)	0.75 (0.48, 1.18)	0.214