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Loss to follow-up among infants in a study of isoniazid prophylaxis (P1041) in South Africa

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SUMMARY

OBJECTIVE—To assess risk factors for loss to follow-up (LFU) from the IMPAACT P1041 study, an isoniazid (INH) prophylaxis study conducted in southern Africa.

DESIGN—Infants in two cohorts, human immunodeficiency virus-infected (HIV+) and HIV-exposed but non-infected (HIV–), were randomized to INH or placebo for 96 weeks. LFU was evaluated at week 96.

RESULTS—Of 1351 infants, 12.9% were LFU (10.4% HIV+, 14.7% HIV–); 65% of the HIV+ cohort was asymptomatic. Among HIV+ infants, large household size (>6 vs. <4 members, $P=0.035$) and presence of an elder (>55 years, $P=0.05$) were associated with better retention. Although attenuated in adjusted analysis, these associations held among HIV– infants. Among HIV– infants, having a younger mother increased the risk ($P=0.008$) and maternal history of TB reduced the risk of LFU, the latter by nearly 70% ($P=0.048$ univariate, 0.09 adjusted). LFU was largely due to inability to contact the participant (58% HIV+, 30% HIV–), and inability to attend the clinic and withdrawal of consent (HIV–).

CONCLUSIONS—Household support was an important factor in participant retention, particularly for the non-HIV-infected cohort, as young maternal age was a risk factor for LFU. Retaining study participants from this mobile population can be challenging and may warrant additional support.

Keywords

retention; children; tuberculosis

In 2009, 1.7 million people died of tuberculosis (TB) and there were 9.4 million new TB cases, including 1.1 million cases among people with known human immunodeficiency virus (HIV) infection.¹ Although the World Health Organization (WHO) Stop TB Partnership notes that they are on target globally to halve TB deaths by 2015, this will remain a challenge in areas such as sub-Saharan Africa, where HIV remains epidemic and contributes to TB prevalence. The risk of developing TB disease is particularly high in the

first 2 years of life,² with HIV-infected children and HIV-exposed children at increased risk of TB.^{3,4}

P1041 was a phase II/III, randomized, double-blind placebo-controlled study to determine the efficacy of primary isoniazid (INH) prophylaxis vs. placebo to prevent TB and latent TB infection among HIV-1 perinatally exposed infants (both HIV-positive and -negative) in South Africa. The study found that INH prophylaxis did not improve disease-free survival among HIV-infected children, nor did it improve infection-free survival among the HIV-exposed, non-infected (non-HIV-infected) children.⁵ A key component to establishing efficacy is to ensure ongoing study participation and reduce loss to follow-up (LFU). Reasons for LFU can include withdrawal of consent, unwillingness to be evaluated, inability to get to the clinic or inability for the site to contact the family of the study participant. LFU in both HIV and TB study populations has historically been an issue;^{6–10} it affects individual assessment of the effectiveness of a treatment program and study outcomes. LFU may be preventable, and identification of these factors therefore has implications for study outcomes.

The aim of this report was to identify the risk factors for LFU in infants and their families who were LFU prior to week 96 after randomization. We report these risk factors for both HIV-infected and non-HIV-infected infants in our study.

METHODS

Setting and population

This study is a secondary analysis of P1041. The infants were enrolled from three sites in South Africa: Chris Hani Baragwanath Hospital, Johannesburg; Tygerberg Hospital, Cape Town; King Edward VIII Hospital, Durban; and from one site in Botswana, Princess Marina Hospital, Gaborone. All sites had existing prevention of mother-to-child HIV transmission programs. The study enrolled HIV-infected and HIV-exposed, non-infected participants in separate cohorts from 13 December 2004 to 7 June 2006. The methodology for this study is presented elsewhere.⁵ Infants were randomized between 90 and 120 days of age.

Study objectives and definitions

The main study objective was to identify risk factors for LFU among HIV-infected and non-HIV-infected infants by 96 weeks (the primary prophylaxis intervention period), plus a 12-week window after randomization. Participants were considered LFU if their family withdrew consent, were unwilling for the child to be evaluated, were unable to get to the clinic, or if the site was unable to contact them for more than three consecutive visits (every 3 months for a total of 9 months). The site then completed an off-study form prior to week 96. Participants still in the study when the Data Safety and Monitoring Board recommended study closure were censored and were not considered LFU, despite a total follow-up time of <96 weeks.

Study oversight

The study was approved by the institutional review board of each site, the Medicines Control Council in South Africa, and the Division of AIDS and NIAID, as documented in the original study.⁵ Good Clinical Practice Guidelines and the Declaration of Helsinki were followed. Written consent was obtained from the legal guardians of the children prior to randomization.⁵

Data analysis

Comparisons by LFU of child demographics and household characteristics were performed using Fisher's exact test for categorical variables and the Wilcoxon rank-sum test for continuous variables. All covariates used in this analysis were measured at baseline. LFU incidence rates were presented by HIV status and were calculated by dividing the number LFU by the total years of follow-up. The probability of remaining in the study was summarized using a Kaplan-Meier estimate, and differences in LFU by HIV status were assessed using a log-rank test.

Risk factors for LFU were assessed using Cox regression models. All variables were considered in both univariate and adjusted models. Separate analyses were performed for HIV-infected and non-HIV-infected children. Infant factors evaluated included age at enrollment, sex, weight, clinical site of enrollment and method of feeding. Analyses for HIV-infected children also included characteristics of HIV disease (e.g., Centers for Disease Control and Prevention [CDC] classification, CD4 count). Maternal and household factors included the primary care giver's relationship to the infant, maternal age at the time of enrollment, mother's country of birth, number of persons living in the household, number of persons per room in the household, maternal smoking or any other smoking in the household, mother's history of current or past TB, type of housing (informal or shack vs. formal or brick) and household access to water (communal tap vs. tap on plot vs. tap at home). Two-sided *P* values of <0.05 were considered significant, and two-sided *P* values <0.10 were considered marginally significant. Data were analyzed using SAS 9.2 (SAS Institute, Cary, NC, USA).

RESULTS

Demographics of the populations

A total of 1351 children were enrolled and followed in the study, 547 of whom were enrolled in the HIV-infected stratum. Infant, maternal, and household characteristics were similar for the HIV-infected and non-HIV-infected cohorts (Table 1), although there were more males in the non-HIV-infected group than in the HIV-infected group (51% vs. 43%, $P = 0.006$). The non-HIV-infected group also had fewer infants with low birth weight (<2.5 kg; 12%) compared to the HIV-infected group (23%, $P < 0.001$). Ninety-eight per cent of the children had their biological mother as their primary care giver, and two thirds of the care givers had completed 12 years of schooling. Maternal age at the time of delivery was divided into four categories (<25 years, 25–28, 29–32 and >32 years); 30% of HIV-exposed and 32% of HIV-infected infants had mothers who were aged <25 years at delivery. Johannesburg had the highest enrollment for both groups, accounting for 65% of the non-HIV-infected enrollment and 66% of the HIV-infected enrollment. The Cape Town site followed, at 35% and 24%, and Durban at 1% and 10%, respectively. Botswana enrolled four HIV-infected and no non-HIV-infected children.

Loss to follow-up

By 96 weeks, 12.9% (175/1351) of the participants were LFU. LFU percentage in the non-HIV-infected cohort was higher (14.7%, 118/804) than in the HIV-infected cohort (57/547, 10.4%; $P = 0.03$, Table 2). Overall, the HIV-infected children had an incidence of LFU of 7.52 cases per 100 person-years compared to 7.81 in the non-HIV-infected group. The Kaplan-Meier curve shows LFU distribution for the two cohorts; a comparison by log-rank test was not statistically significant ($P = 0.67$; Figure).

HIV-infected cohort

At study entry, 44% of the infants had a CD4 count < 1500 cells/mm³, while 38% had a CD4% $< 25\%$, with almost three quarters having uncontrolled virologic replication ($> 50\,000$ copies/ml). The majority (65%) had asymptomatic HIV disease at entry, and 26% had a condition meeting CDC A classification. Few were moderately or severely symptomatic (8%). At study entry, 69% were not on antiretroviral therapy.

Among these HIV-infected participants, no baseline HIV disease characteristics were associated with patient retention. Having a greater number of persons ($n > 4$) in the household was associated with better study retention. Children from households with > 6 members had a 60% reduced risk of dropout compared to those with < 4 household members (hazard ratio [HR] 0.40, $P = 0.035$). This association remained even after adjusting for other infant, household and HIV disease factors (adjusted HR [aHR] 0.33, $P = 0.035$). Similarly, children who came from households of 5–6 members had a reduced risk of LFU compared to those coming from 4-member households, although this was only marginally significant (HR 0.49, $P = 0.06$). In both univariate and adjusted models, having an adult aged ≥ 55 years in the house was associated with a $> 50\%$ reduction in the risk of dropout (aHR 0.38, $P = 0.05$, Table 3).

HIV-exposed, but non-infected cohort

Among non-HIV-infected infants, there were no differences in LFU based on infant factors (age at enrollment, sex or birth weight). As with the HIV-infected children, having more people in the home was associated with better retention in the univariate analysis (Table 4). Having > 6 persons in the home significantly reduced the risk of LFU compared to those from small (< 4 persons) households (HR 0.48, $P = 0.006$). In the adjusted analysis, HRs remained < 1 (HR 0.63), suggesting a protective association against LFU, although the association was no longer statistically significant. Similar to the HIV-infected cohort, having an adult aged ≥ 55 years was associated with lower rates of LFU (HR 0.57, $P = 0.026$), but this association was only significant in the adjusted model (aHR 0.63, $P = 0.10$). Children born to older mothers (aged > 32 years) were less likely to be LFU than those of younger mothers (aged < 25 years), with a reduction in risk of LFU in both univariate and adjusted models (aHR 0.39, $P = 0.002$). Children born to mothers aged 25–28 years also showed a similar reduction in risk compared to those born to mothers aged < 25 years (aHR 0.58, $P = 0.027$). Having a mother with a previous TB diagnosis was protective of LFU in this group in univariate analysis (HR 0.31, $P = 0.048$), but this association was attenuated slightly after adjustment for other factors, and was only marginally significant (aHR 0.37, $P = 0.09$).

Loss to follow-up in both cohorts

Across both groups there were no differences in LFU between the infants assigned to the INH compared to those in the placebo groups ($P = 0.78$ in the non-HIV-infected and $P = 0.11$ in the HIV-infected). The primary reasons listed by the sites for LFU varied by cohort ($P < 0.001$, Table 5). For both cohorts, inability to contact the participant accounted for a large percentage (58% for HIV-infected and 30% for non-HIV-infected), but for the non-HIV-infected, inability to get to the clinic (41%) and withdrawal of consent (25%) also contributed significantly to LFU.

DISCUSSION

Various LFU rates, from as low as 3% to as high as 56%, have been reported in studies in HIV-infected African populations.^{6,11,12} Poverty, social factors such as family and community support, and political turmoil may contribute to the high mobility of study populations, making prevention of LFU challenging. In our study, 12.9% of the infants

(14.7% of non-HIV-infected and 10.4% of HIV-infected infants) were LFU at 96 weeks of the study. An important factor associated with higher LFU, noted specifically in the non-HIV-infected cohort, was young maternal age. Obasanjo and Kumenda also found that younger maternal age was a critical predictor for LFU.¹³ They also noted lower educational level of the father and single parenthood as important contributing factors, data that were not collected in our study.¹³ We hypothesize that these young mothers did not have the necessary coping skills, leading to an unstable home environment and risk for LFU.

Of interest is that children whose mothers had previously had TB were more likely to remain in the study. One possible explanation is that these mothers had a better understanding of the disease and its impact on health, which led them to try to keep their young children on a study evaluating preventive prophylaxis for TB.

Another important factor associated with study retention was household size; our data suggest that living with an extended family or in a household that included elders could be a marker for a stable home environment. These larger households may have provided child care or household management support critical to study retention. These elders may have been surrogate or actual grandparents and helped the mothers with coping skills. Depending on the health of the HIV-infected mother, these elders may at times have been the primary care givers for both the mother and the infant. Our findings suggest that both personal and household support systems are crucial to ensuring retention of study patients and, hopefully, to yielding better patient outcomes.

Data from a retrospective unmatched, case-control study looking at LFU in TB patients in Nairobi, Kenya, among a large, highly mobile impoverished population, revealed LFU of 13% over a 2½ year period.⁹ These authors suggested that LFU was due to the study staff's inability to contact these families due to their constant relocation to rural homes. In our study, 41% of the HIV-exposed, non-infected LFU infants were not contactable by site staff. Poverty, the basic instability of the home environment and the mother's need to find a new place to live or to find work may have contributed to LFU. The differences between risk factors for LFU in HIV-exposed, non-infected and HIV-infected cohorts may have been the family's recognition that HIV therapy and care in specialized HIV clinical settings are essential to their child's survival. A study looking at overall performance of the HIV program found that non-treated children were more often LFU than those on treatment; these authors also suspected that this was due to a high mortality rate in the untreated group.⁷ While we did not evaluate transportation as a factor in LFU, difficulties with travel and lack of transportation in the cities where our trial was conducted remain a concern.

Limitations

There was a significant attempt by study staff to contact those who were lost to follow-up. Despite these efforts, determining the reason for LFU was not always possible, and this may be seen as a limitation to our study. When deaths were reported, death certificates were often not obtained and/or autopsies were not performed, and we often relied on information from family members. In one case, a site learned through word of mouth that a child had died, but as this information was not received through a family member, this event was classified as LFU and not as an endpoint.

As P1041 was a study investigating INH for prevention of TB in children, data collected on their care givers or household members were primarily restricted to information pertaining to the child's risk for TB. Information on their mothers' vital status was limited to baseline; at entry, two mothers of HIV-infected children had died.

CONCLUSIONS

Both study teams and sponsors were concerned about LFU and its impact on study results. While LFU is almost always considered in developing a sample size due to its impact on power, LFU can also bias study results. Establishing the appropriate support system in patient management and providing additional guidance for specific populations will be crucial to facilitating high retention in future clinical trials. Data from this and other studies that critically examine factors associated with LFU should inform future investigations in these populations. Several risk factors for LFU have been identified in our study, including young maternal age, lack of an elder in the home and small household size. Appropriate, targeted interventions can be implemented by future investigators for those study participants who might be at greater risk of LFU based on these results. These data may also be useful to program managers offering preventive services to identify patients who might require intensified support for retention in care.

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Figure.

Kaplan-Meier estimate of the probability of remaining in the study for 1351 children with at least one visit, by cohort of enrollment in P1041. Log-rank test: $P = 0.67$. HIV-infected: 547 persons enrolled, 57 LFU, 7.52 LFU/100 person-years (95%CI 5.75–9.64); non-HIV-infected: 804 persons enrolled, 118 LFU, 7.81 LFU/100 person-years (95%CI 6.51–9.28). HIV = human immunodeficiency virus; LFU = loss to follow-up; CI = confidence interval.

Table 1

Demographics and household/maternal characteristics of children enrolled in P1041 by cohort

Characteristic	Non-HIV-infected (<i>n</i> = 804) <i>n</i> (%) [*]	HIV-infected (<i>n</i> = 547) <i>n</i> (%) [*]	Total (<i>N</i> = 1351) <i>n</i> (%) [*]	<i>P</i> value [†]
Male sex	411 (51)	237 (43)	648 (48)	0.006
Race/ethnicity				
Black	775 (96)	536 (98)	1311 (97)	0.046
Colored	29 (4)	10 (2)	39 (3)	
Other	0	1 (0)	1 (0)	
Randomized treatment group				
Isoniazid	403 (50)	273 (50)	676 (50)	0.96
Site				
Johannesburg	519 (65)	359 (66)	878 (65)	<0.001
Cape Town	278 (35)	131 (24)	409 (30)	
Botswana	0	4 (1)	4 (0)	
Durban	7 (1)	53 (10)	60 (4)	
Birth weight, g, median [Q1, Q3]	3008 [2700, 3350]	2880 [2520, 3200]	2980 [2650, 3300]	<0.001
Low birth weight (<2500 g)	98 (12)	124 (23)	222 (16)	<0.001
Mother completed 12 years of schooling	246 (31)	181 (33)	427 (32)	0.34
Number of persons living in the home [‡]				
<4	211 (26)	162 (30)	373 (28)	0.54
4	191 (24)	120 (22)	311 (23)	
5–6	210 (26)	143 (26)	353 (26)	
>6	192 (24)	122 (22)	314 (23)	
More than 3 persons sharing a room	329 (41)	189 (35)	518 (38)	0.020
Person aged ≥5 years in household [§]	195 (24)	128 (23)	323 (24)	0.75
Mother's age at birth of index child, years				
<25	240 (30)	177 (32)	417 (31)	0.14
25–28	205 (25)	124 (23)	329 (24)	
29–32	201 (25)	118 (22)	319 (24)	
>32	158 (20)	128 (23)	286 (21)	
Mother ever diagnosed with tuberculosis	58 (7)	39 (7)	97 (7)	1.00
Type of residence [¶]				
Formal (brick) house	468 (58)	345 (63)	813 (60)	0.023
Informal (shack/wooden)	336 (42)	198 (36)	534 (40)	
Dormitory/hostel	0	2 (0)	2 (0)	
Study participant breastfed by baseline	48 (6)	73 (13)	121 (9)	<0.001
Access to water in subject's household				
Tap (running water) inside house	258 (32)	189 (35)	447 (33)	0.008
Tap (running water) on plot, single use	314 (39)	241 (44)	555 (41)	
Communal tap, multiple households	232 (29)	117 (21)	349 (26)	
History of cigarette smoking by mother [¶]	79 (10)	46 (8)	125 (9)	0.44

* Percentages based on available data.

[†] *P* values from Fisher's exact test and Wilcoxon rank-sum test, as appropriate.

[‡] Data missing for 1 child.

[§] Data missing for 3 children.

[¶] Data missing for 2 children.

HIV = human immunodeficiency virus; Q = quartile.

Table 2

Number of patients lost to follow-up for each site by enrollment cohort

Site	Non-HIV-infected <i>n</i> (%) [*]	HIV-infected <i>n</i> (%) [*]	Total <i>n</i> (%) [*]
Johannesburg	83 (16.0)	38 (10.6)	121 (13.8)
Cape Town	33 (11.9)	12 (9.2)	45 (11)
Durban	2 (28.6)	7 (13.2)	9 (15)
Botswana	— [†]	0	0

^{*} Percentages reflect per cent lost to follow-up at each site within each cohort and overall, as appropriate.

[†] No non-HIV-infected children enrolled at the Botswana site.

HIV = human immunodeficiency virus.

Table 3

Cox regression for loss to follow-up among children in HIV-infected cohort

Characteristic	Univariate		Adjusted (<i>n</i> = 503)	
	HR (95%CI)	<i>P</i> value	aHR (95%CI)	<i>P</i> value
Female	0.96 (0.57–1.62)	0.89	1.07 (0.61–1.90)	0.81
Isoniazid treatment group	1.69 (0.99–2.89)	0.05	1.61 (0.90–2.89)	0.11
Site (reference = Johannesburg)	—	0.97	—	1.00
Cape Town	0.90 (0.47–1.73)	0.76	1.02 (0.42–2.45)	0.97
Durban	1.15 (0.51–2.57)	0.74	1.08 (0.38–3.03)	0.89
Low birth weight (<2.5 kg)	1.21 (0.67–2.19)	0.52	1.16 (0.61–2.20)	0.65
Mother completed 12 years of schooling	0.76 (0.42–1.37)	0.35	0.83 (0.43–1.63)	0.60
Number of persons living in home (reference = 4)	—	0.05	—	0.16
4	1.00 (0.54–1.88)	0.99	0.76 (0.36–1.62)	0.48
5–6	0.49 (0.23–1.03)	0.06	0.51 (0.22–1.20)	0.12
>6	0.40 (0.17–0.94)	0.035	0.33 (0.12–0.93)	0.035
More than 3 persons sharing a room	1.27 (0.74–2.17)	0.38	1.96 (1.00–3.83)	0.05
Person aged >55 years in house	0.44 (0.20–0.98)	0.044	0.38 (0.14–1.01)	0.05
Mother's age group at birth (reference <25 years)	—	0.43	—	0.32
25–28	0.83 (0.43–1.60)	0.57	0.81 (0.39–1.68)	0.58
29–32	0.59 (0.27–1.26)	0.17	0.49 (0.21–1.13)	0.10
>32	0.62 (0.30–1.29)	0.20	0.60 (0.27–1.32)	0.20
Mother ever diagnosed with tuberculosis	0.55 (0.17–1.77)	0.32	0.57 (0.16–1.95)	0.37
Informal housing (vs. formal housing)	1.08 (0.64–1.80)	0.77	0.70 (0.33–1.50)	0.36
Study participant ever breastfed	1.21 (0.59–2.47)	0.60	0.96 (0.40–2.27)	0.92
Water access (reference tap inside house)	—	0.46	—	0.87
Tap on plot	1.36 (0.76–2.44)	0.30	1.16 (0.55–2.41)	0.70
Communal tap (multiple households)	0.95 (0.44–2.05)	0.90	0.95 (0.33–2.71)	0.92
History of cigarette smoking by mother	0.72 (0.26–1.98)	0.52	0.71 (0.25–2.08)	0.54
CDC Class A, B or C (vs. non-symptomatic)	1.05 (0.61–1.83)	0.85	1.08 (0.55–2.11)	0.83
CD4 count <1500 µg/ml	0.73 (0.42–1.26)	0.26	0.92 (0.49–1.75)	0.80
CD4% < 25%	0.75 (0.42–1.31)	0.31	0.72 (0.36–1.46)	0.36
Viral load >50 000 cp/ml	0.95 (0.52–1.74)	0.87	0.85 (0.35–2.06)	0.72
Antiretrovirals initiated at/before entry	0.95 (0.53–1.70)	0.87	0.93 (0.37–2.33)	0.88

HIV = human immunodeficiency virus; HR = hazard ratio; CI = confidence interval; aHR = adjusted HR; CDC = Centers for Disease Control and Prevention.

Table 4

Cox regression for loss to follow-up among children in non-HIV-infected cohort

Characteristic	Univariate		Adjusted (<i>n</i> = 802)	
	HR (95%CI)	<i>P</i> value	aHR (95%CI)	<i>P</i> value
Female	1.12 (0.78–1.61)	0.53	1.12 (0.77–1.61)	0.56
Isoniazid treatment group	0.90 (0.63–1.30)	0.59	0.95 (0.66–1.37)	0.78
Site (reference = Johannesburg)	—	0.12	—	0.024
Cape Town	0.71 (0.48–1.07)	0.10	0.64 (0.41–0.99)	0.046
Durban	2.20 (0.54–8.96)	0.27	3.38 (0.79–14.51)	0.10
Low birth weight (<2.5 kg)	0.80 (0.44–1.46)	0.47	0.87 (0.48–1.60)	0.66
Mother completed 12 years of schooling	1.08 (0.73–1.59)	0.70	1.06 (0.71–1.58)	0.78
Number of persons living in home (reference = 4)	—	0.019	—	0.30
4	0.57 (0.35–0.93)	0.026	0.59 (0.33–1.03)	0.07
5–6	0.63 (0.39–1.01)	0.05	0.80 (0.47–1.35)	0.41
>6	0.48 (0.29–0.81)	0.006	0.63 (0.32–1.24)	0.18
More than 3 persons sharing a room	0.67 (0.45–0.98)	0.040	0.87 (0.54–1.41)	0.58
Person aged >55 years in house	0.57 (0.35–0.94)	0.026	0.63 (0.37–1.09)	0.10
Mother's age group at birth (reference <25 years)	—	0.038	—	0.008
25–28	0.64 (0.40–1.03)	0.07	0.58 (0.36–0.94)	0.027
29–32	0.70 (0.44–1.12)	0.14	0.66 (0.41–1.05)	0.08
>32	0.45 (0.25–0.81)	0.008	0.39 (0.22–0.70)	0.002
Mother ever diagnosed with tuberculosis	0.31 (0.10–0.99)	0.048	0.37 (0.12–1.18)	0.09
Informal housing (vs. formal housing)	1.20 (0.83–1.72)	0.33	1.00 (0.61–1.62)	0.99
Study participant ever breastfed	1.16 (0.56–2.37)	0.69	1.08 (0.52–2.24)	0.83
Water access (reference tap inside house)	—	0.26	—	0.50
Tap on plot	1.27 (0.81–2.00)	0.31	1.14 (0.69–1.86)	0.62
Communal tap (multiple households)	1.48 (0.93–2.37)	0.10	1.43 (0.78–2.62)	0.25
History of cigarette smoking by mother	0.75 (0.38–1.48)	0.41	0.78 (0.39–1.57)	0.49

HIV = human immunodeficiency virus; HR = hazard ratio; CI = confidence interval; aHR = adjusted HR.

Table 5

Reported reasons for loss to follow-up by cohort *

Primary reason for leaving study	Non-HIV-infected (<i>n</i> = 118) <i>n</i> (%)	HIV-infected (<i>n</i> = 57) <i>n</i> (%)
Unable to get to clinic	48 (41)	8 (14)
Consent withdrawn	30 (25)	10 (18)
Unwilling to adhere to study requirements	5 (4)	6 (11)
Unable to contact	35 (30)	33 (58)

* $P < 0.001$ using Fisher's exact test.

HIV = human immunodeficiency virus.