Factors Associated with Loss to Follow-up among HIV-Infected Patients at an Urban, Hospital-Based Outpatient HIV Clinic

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Abstract (#1058)

BACKGROUND: Loss to follow-up (LTF) from HIV care has been linked to multiple negative health outcomes, including virologic failure, disease progression and reduced survival. We sought to elaborate the primary epidemiologic factors associated with LTF among patients newly enrolled in an urban, hospital-based outpatient HIV program.

METHODS: We completed a retrospective medical record review of all new patients presenting for care between 2005 and 2008. LTF was defined as an interruption between medical visits of more than 180 days. Alpha was set at <0.05 with a 95% CI. Bivariate analyses were performed using SPSS 15.0 (IBM, Inc., Chicago, IL).

RESULTS: Among the 321 patients included in the analysis, three groups were identified: patients without lapses in medical visits (No LTF; 37%); patients intermittently LTF who later returned to care (ILTF; 30%), and patients permanently lost to follow-up (PLTF; 33%). Demographic variables associated with PLTF included younger age (p=0.033) and residence in a medical, corrections or rehabilitation facility (p=0.012). Other significant risk factors included prior incarceration (p=0.012), reported use of alcohol and/or recreational drugs (p=0.015), and evidence of anxiety or depression on routine screening at program intake (p=0.016 and 0.005, respectively). A transmission risk factor of injection drug use (IDU) was associated with PLTF (p=0.002), while a CD4 count less than 100 at program entry correlated with increased retention in care (p=0.035). Conditioned bivariate analyses demonstrated reduced engagement occurring more commonly among young African Americans (p=0.026), White, non-Hispanic IDU (p<0.001) and women with histories of arrest (p=0.036) and incarceration (p=0.036). Conditioned bivariate analyses demonstrated reduced engagement occurring more commonly among young Black/ African Americans (p=0.026), White, non-Hispanic IDU (p<0.001) and women with histories of arrest (p=0.036) and incarceration (p=0.036).

CONCLUSION: LTF is an all-too-common phenomenon in HIV care with potentially significant consequences for patients. Multiple clinical, demographic and psychosocial factors are associated with suboptimal retention in care. Special strategies to enhance the engagement of patients at highest risk for LTF are warranted.

Background

- Many HIV-infected Americans have failed to reap the benefits of current HIV therapies because of suboptimal rates of diagnosis, linkage, engagement and retention.[1]
- Non-adherence with medical visits has been associated with multiple undesirable outcomes:
  - lower CD4 counts and higher viral loads[2]
  - delays in virologic suppression and increased HIV viral load burden[3]
  - virologic failure[4]
  - the development of AIDS-defining illnesses[5]
  - reduced survival[5-11]
- Previous studies have coupled several clinical, demographic and psychosocial factors with the phenomenon of patient loss to follow-up (LTF).
- We aimed to establish the incidence of LTF and identify the correlates of LTF among patients newly enrolled in care at the AIDS Activities Office (AAO) of Lehigh Valley Health Network, an urban, multidisciplinary primary care practice for almost 800 HIV-infected patients in Allentown, PA.

Methods

- Completed retrospective chart review of medical and case management records of all new patients enrolling into care between January 2005 and June 2008 (n=321)
- Calculated number of days between consecutive medical visits from 2005 to 2010
- **"Loss to Follow-up" (LTF)** defined as any unexplained interrruption between medical visits of greater than 180 days.
- Potential correlates of LTF examined through bivariate and conditioned bivariate analyses using SPSS 15.0 (IBM, Inc., Chicago, IL).
  - Alpha set at <0.05 with a 95% CI.
- Study approved by Institutional Review Board of Lehigh Valley Health Network.

Patient Categories		
	Abbreviation	**Definition**
No Loss to Follow-up	No LTF	Patients without any unexplained lapse in medical care >180 days
Intermittent LTF	ILTF	Patients intermittently lost to follow-up (>180 days) who later return to care
Permanent LTF	PLTF	Patients permanently lost to follow-up during analysis

Table I. Frequency of Loss to Follow-up Among Newly Enrolled Patients

	N	Percent
No LTF	120	37.4%
ILTF	96	29.9%
PLTF	105*	32.7%
TOTAL	321	100%

* 45/105 PLTF patients (42.8%) only had a single medical visit.

Table II. Analysis of Factors Potentially Associated with Loss to Follow-up Among New Patients

Variables	N	No LTF		ILTF		PLTF		p Value
		%	N	%	N	%	N	
Gender	319							
Female		38%	38	27%	27	35%	35	.670
Male		37.4%	82	31.5%	69	31.1%	68	
Age (Quartiles)	321							
16-37		30%	32	24.7%	22	39.3%	35	.033
38-43		27.5%	21	32.5%	25	39.5%	30	
44-49		39.5%	30	39.5%	30	21.1%	16	
50-73		46.3%	37	23.8%	19	30%	24	
Race/Ethnicity	316							
White Non-Hispanic		43.5%	47	24.1%	26	32.4%	35	.280
Black Non-Hispanic		34.4%	30	35.6%	31	29.9%	26	
Hispanic		32.2%	39	31.4%	38	36.4%	44	
Initial CD4 Count	309							
<=100		35.4%	43	27.0%	20	17.6%	13	.035
101 - 200		32.3%	10	25.8%	8	41.0%	13	
201 - 350		29.0%	18	38.7%	24	32.3%	20	
351 - 500		33.9%	19	30.4%	17	35.7%	20	
501 +		33.7%	29	30.2%	36	36.0%	31	
Transmission Status	309							
Heterosexual		37.4%	58	29.7%	46	32.9%	51	.002
MSM		47.9%	45	31.9%	30	20.2%	19	
IDU		21.7%	13	28.3%	17	50%	30	
Drug/ETOH Use (Not Nicotine)	243							
Yes		30.6%	48	31.8%	50	37.6%	59	.046
No		39.5%	34	38.4%	33	22.1%	19	
Drug/ETOH Use (Inc. Nicotine)	245							
Yes		30.1%	53	32.4%	57	37.5%	66	.015
No		43.5%	30	37.7%	26	18.8%	30	
Living Situation	230							
With Parents or Family		34.6%	27	41.0%	32	24.4%	19	.012
With Spouse/Partner		40.0%	26	36.9%	24	23.1%	15	
Alone/Roommate		32.1%	17	34.0%	18	34.0%	18	
Institution/Treatment Ctr		20.6%	7	20.6%	7	58.8%	20	
Poverty Status	280							
< Federal Poverty Level		42.1%	96	30.3%	69	27.6%	63	.009
100-200% Poverty Level		57.7%	15	42.3%	11	0%	0	
>200%		26.9%	7	50.0%	13	23.1%	6	
History of Incarceration	216							
Yes		23.5%	19	33.3%	27	43.2%	35	.012
No		40.0%	54	34.1%	46	25.9%	35	
Anxiety Score (HADS)**	252							
Low (0 - 7)		42.4%	50	42.4%	50	15.3%	18	.016
Moderate (8 - 10)		41.3%	19	37.0%	17	21.7%	10	
High (11 - 21)		40.9%	36	25.0%	22	34.1%	30	
Depression Score (HADS) **	252							
Low (0 - 7)		38.6%	61	39.9%	63	21.5%	34	.005
Moderate (9 - 10)		62.0%	31	22.0%	11	16.0%	8	
High (11 - 21)		29.5%	13	34.1%	15	36.4%	16	

**HADS=Hospital Anxiety and Depression Scale

Results

- More than 60% (201/321) of newly enrolled patients had at least one episode of LTF during the six years of observation. (Table I)
  - 48% (96/201) were ultimately reengaged in care (ILTF).
  - Patients with a single medical visit accounted for 43% of the PLTF group.
- Several factors increased the risk of interrupted patient engagement (p<0.05). (Table II)
  - Demographic: Age < 43 years
  - Psychosocial:
    - Reported use of alcohol, recreational drugs and nicotine
    - History of incarceration
    - Temporary residence in a medical, corrections or rehabilitation facility (almost 80% with some visit gap and 59% with PLTF)
    - Screening indicating significant anxiety or depression at program intake (enrollment in psychiatric services was not predictive).
  - Clinical: HIV transmission via injection drug use
- Low baseline CD4 count (<100 cells/mL) was associated with sustained retention in care.
- Surprisingly, patients with lower incomes were less likely to have visit interruptions.
- The following factors were not statistically correlated with LTF:
  - Baseline Viral Load
  - New HIV or AIDS Diagnosis
  - Zip Code/Proximity to Practice
  - Method of Transportation
  - Marital Status
  - Children Age <18 years at Home
  - Education Level
  - Employment Status
  - History of Arrest
  - Insurance Status
  - Enrollment in Mental Health Program
  - Learning Impairments
  - Probation or Parole at Intake
- Conditioned bivariate analysis revealed unique sub-groups with heightened risk for LTF: (Table III)
  - Non-Hispanic White Females
  - Non-Hispanic Blacks ≤43 years
  - Non-Hispanic Whites with a history of drug/alcohol use
  - Females with histories of arrest or incarceration
  - Non-Hispanic Whites with histories of arrest or incarceration

Table III. Conditioned Bivariate Analysis of LTF Among New HIV Patients

Variables	N	No LTF		ILTF		PLTF		p Value
		%	N	%	N	%	N	
Gender* Race/Ethnicity	314							
White Non-Hispanic								
Female		30.0%	6	10.0%	2	60.0%	12	.012
Male		46.6%	41	27.3%	24	26.1%	23	
Black Non-Hispanic		Not Significant						
Hispanic		Not Significant						
Age* Race/Ethnicity	316							
White Non-Hispanic		Not Significant						
Black Non-Hispanic								
16-37		23.8%	5	38.1%	8	38.1%	8	.026
38-43		19.0%	4	33.3%	7	47.6%	10	
44-49		33.3%	7	52.4%	11	14.3%	3	
50-73		58.3%	14	20.8%	5	20.85	5	
Hispanic		Not Significant						
Transmission Status* Gender	309							
Female								
Heterosexual		44.4%	32	26.4%	19	29.2%	21	.042
IDU		19.0%	4	23.8%	5	57.1%	12	
Male								
Heterosexual		31.3%	26	32.5%	27	36.1%	30	.005
MSM		48.9%	45	32.6%	30	18.5%	17	
IDU		23.1%	9	30.8%	12	46.2%	18	
Transmission Status* Race/Ethnicity	309							
White Non-Hispanic								
Heterosexual		30.8%	12	28.2%	11	41%	16	.001
MSM		57.9%	33	24.6%	14	17.5%	10	
IDU		10.0%	1	10.0%	1	80.0%	8	
Black Non-Hispanic		Not Significant						
Hispanic		Not Significant						
Drug/Alcohol Use* Race Ethnicity (exc. Nicotine)	239							
White Non-Hispanic								
Yes		36.4%	16	18.2%	8	45.5%	20	.014
No		45.8%	11	41.7%	10	12.5%	3	
Black Non-Hispanic		Not Significant						
Hispanic		Not Significant						
Arrest or Incarceration* Gender	244							
Female								
Prior Arrest		23.8%	10	33.3%	14	42.9%	18	.036
No Prior Arrest		51.4%	18	25.7%	9	22.9%	8	
Male		Not Significant						
Female								
Prior Incarceration		20.0%	4	25.0%	5	55.0%	11	.036
No Prior Incarceration		47.6%	20	28.6%	12	23.8%	10	
Male		Not Significant						
Arrest or Incarceration* Race/Ethnicity	213							
White Non-Hispanic								
Yes		24.4%	10	31.7%	13	43.9%	18	.012
No		57.5%	15	26.9%	7	15.4%	4	
Black Non-Hispanic		Not Significant						
Hispanic		Not Significant						

Conclusions

- Loss to follow-up is an all-too-common phenomenon among patients newly enrolled in care, with more than half of these individuals exhibiting unexplained absences greater than 180 days during six years of observation.
- Since LTF has been associated with multiple detrimental health outcomes, special strategies to enhance the engagement of HIV patients at highest risk for LTF are warranted.
- Prospective studies assessing the impact of programmatic interventions to improve patient retention rates are desperately warranted.

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