



Immune Status at Presentation to Care has not Improved among Antiretroviral Naïve Persons from 1990-2006

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ABSTRACT

Background: HIV prevention initiatives and innovative care models to improve access to HIV services have evolved over time. Despite these efforts, it is estimated that > 250,000 HIV-infected persons in the U.S are undiagnosed, and many do not present until their HIV infection is advanced. Late presentation may increase risk of HIV transmission and make HIV more difficult to effectively treat. With easier tolerated and more effective HIV therapies, it was hoped that patients might present earlier in their disease course. To assess this, we analyzed the immune status of patients who newly presented for care over the past 16 years in a large urban academic center.

Methods: We analyzed data from 1990 through 2006 from patients who were antiretroviral (AR) naïve at presentation to the Johns Hopkins HIV Clinic in Baltimore, MD. Patients were stratified by year of presentation as 1990-94, 1995-98, 1999-02, and 2003-06. We compared CD4 count at presentation by demographic characteristics at enrollment. Multivariate logistic regression was used to assess the association of CD4 count and demographic characteristics by year of enrollment.

Results: Since 1990, 3172 AR naïve patients presented for care. Over time, the proportion of patients by gender and race remained stable, however the proportion of patients with heterosexual transmission increased relative to IDU and MSM, and the age of the patients increased. Presenting median CD4 declined over time overall, and by individual demographic groups (Table 1). In multivariate analysis, CD4 at presentation significantly declined from 1990-94 to 2003-06 ($p < 0.0001$). Male sex was independently associated with lower CD4 (-97 cells) as was black race (-76 cells) and older age (-17 cells/10 years). IDU was associated with higher CD4 (+58 cells). No demographic group had an increase in CD4 over time.

Date	Median CD4 Cell Count/mm ³							
	All	Women	Men	Black	White	Hetero	MSM	
1990-94	371	448	335	361	432	410	395	330
1995-98	316	398	264	300	361	327	331	285
1999-02	270	312	238	253	318	270	274	291
2003-06	292	302	285	289	317	293	291	308

Conclusion: There has been no change in the extent of immunosuppression at presentation to care in the last 16 years. Males and those of black race/ethnicity are significantly more likely to present with lower CD4 counts. IDUs presented with somewhat higher CD4 counts relative to other risk groups, although all were low. New strategies to provide earlier HIV testing and referral into care are urgently needed.

Background

- The CDC estimates that > 250,000 HIV infected persons in the U. S. are undiagnosed, and that many patients present late in the course of their HIV infection.
- The Baltimore Eligible Metropolitan Area has good financial support from the CDC, offering anonymous and confidential reporting, and Ryan White, supporting access to HIV primary care sites, irrespective of the insurance status of the patient.

Objective

- To assess if patients present for HIV care earlier in the course of their HIV infection in a large metropolitan area over the course of time

Methods

PATIENT SELECTION

- The Johns Hopkins HIV Clinical Cohort; an observational study of adult patients who receive longitudinal HIV primary care in an urban clinic. Demographic, clinical, and therapeutic data are collected at enrollment and every 6 months. Laboratory data are collected and processed through receipt of electronic files.

CRITERIA/DEFINITIONS

- New enrollees to the clinical practice and antiretroviral naïve
- Patients stratified by year of presentation to clinic
 - 1990-1994
 - 1995-1998
 - 1999-2002
 - 2003-2006
- HIV Risk behavior and date first known to be HIV + are self-reported

ANALYSES

- Univariate frequencies and means of demographic and clinical variables stratified by year of enrollment
- Multivariate linear regression to assess association of CD4 count and these variables.

Results

Table 1 Patient Characteristics

Characteristic	Year of Enrollment to Clinic			
	1990-94 N=1100	1995-98 N=927	1999-2002 N=822	2003-2006 N=323
Age/yrs (Median/Q1,Q4)	34 (30, 40)	38 (32, 43)	39 (33, 45)	40 (33, 45)
Male Sex	722 (66 %)	612 (66 %)	527 (64 %)	196 (61 %)
Race/Ethnicity	833 (80 %) 201 (18 %)	753 (81 %) 166 (18 %)	633 (77 %) 159 (19 %)	196 (61 %) 127 (39 %)
CD4	371 (154, 605)	316 (89, 514)	270 (88, 500)	292 (101, 465)
Stage	397 (36 %) 172 (16 %) 531 (48 %)	399 (43 %) 97 (10 %) 431 (46 %)	376 (45 %) 71 (8 %) 373 (45 %)	133 (41 %) 114 (35 %) 76 (23 %)
AIDS presenting w ADI	147 (37%)	143 (38 %)	126 (33 %)	47 (35 %)
Days from 1 st knowing to be HIV+ and entering into care (Median/Q1,Q4)	271 (82, 830)	416 (63,1569)	176 (51, 1432)	190 (68, 1251)

Table 2a Median CD4 Cell Count/mm³ and Time to Presentation/days*

Date	Women		Men		Black		White	
	CD4	Time to Present	CD4	Time to Present	CD4	Time to Present	CD4	Time to Present
1990-94	448	274	335	270	361	273	432	264
1995-98	398	394	264	429	300	434	361	310
1999-02	312	200	238	159	253	223	318	95
2003-06	302	258	285	143	289	224	317	113

Table 2b Median CD4 Cell Count/mm³ and Time to Presentation/days*

Date	Hetero		IDU		MSM	
	CD4	Time to Present	CD4	Time to Present	CD4	Time to Present
1990-94	410	295	395	372	330	253
1995-98	327	338	331	754	285	498
1999-02	270	156	274	797	291	106
2003-06	293	231	291	647	308	70

* Days from first knowing about HIV + status and presenting to care

Table 3 Multivariate Analysis of Factors associated with CD4 Cell counts over time

Parameter	Estimate	Standard Error	P Value
Yr. of Enrollment			
1990-94	--	--	--
1995-98	-52	15.2	0.001
1999-02	-74	16.2	<0.001
2003-06	-84	22.0	<0.001
Age/10 years	-17	6.9	0.02
Male sex	-98	12.7	<0.001
Black race/ethnicity	-74	14.8	<0.001
IDU	58	12.5	<0.001

Heterosexual transmission, and time to presentation not significant.

Conclusions

Over time, among new patients presenting antiretroviral naïve significant differences emerged:

- The proportion of patients by gender remained stable; there was an increase in female sex and increase in the age of patients.
- Risk of transmission changed with an increase in heterosexual and a decrease in IDU; MSM remained stable (data not shown)
- Patients presented with advanced disease with >33% presenting with AIDS. Among those with AIDS, OVER 33% presented with an AIDS Defining Illness. In 2003-06, more patients presented with symptomatic infection, compared to earlier time periods.
- In all patients, except MSMs, CD4 counts at presentation decreased over time. White patients and MSM patients presented for care earlier after knowing their HIV diagnosis compared to IDUs.
- In multivariate analysis, CD4 cell counts at presentation decreased over time. Older age and male sex were also associated with a decrease in CD4 cell counts.
- In the past 16 years, there has been no improvement in getting clients into care earlier in the course of their disease. Patients present with AIDS and a high proportion with an AIDS indicator condition, potentially complicating the initiation of treatment. Disparities in the time to when patients present to care continue. The implementation of new strategies for HIV testing and entry to care, recommended by the CDC, are urgently needed.