



Newly Diagnosed HIV Infection in the Era of HAART: Age, Survival, and Serum Markers



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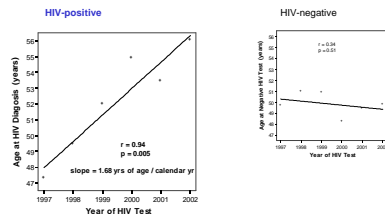
Background

- Many patients are only diagnosed with HIV infection when they already have symptoms.
- Despite CDC recommendations for universal HIV testing ages 13 to 64, this is not widely practiced.
- These recommendations ignore persons ≥ 65 years of age, many of whom are at risk for HIV infection

Patient Characteristics

	Newly diagnosed HIV[+] patients n = 112	Patients who tested HIV[-] n = 2,469	p
Age (years), mean \pm SD	51.6	49.7	0.13
Female sex, No. (%)	2 (1.8%)	193 (7.8%)	0.016
HIV RNA level (1000 copies/mL), median [IQR]	77.7 [17.2–248]	---	---
CD4+ cells (per mm ³ , median [IQR]	182 [41–320]	---	---
CD4+ cells <200 per mm ³ , No. (%)	52.8%	---	---
CD4+ cells <100 per mm ³ , No. (%)	37.0%	---	---
CD4+ cells <50 per mm ³ , No. (%)	26.9%	---	---
CD4+ cells (%), median [IQR]	13.0% [5–21%]	---	---

Age at HIV Diagnosis



Methods

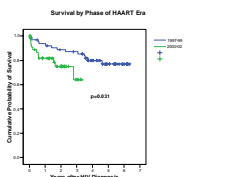
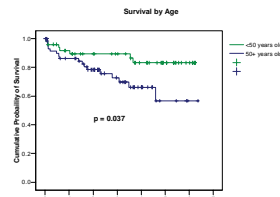
- Electronic chart review of all patients newly diagnosed HIV-positive at a tertiary care VA Medical Center in 1997-2002, the first 6 years of the HAART era
- Analysis of age and survival over time. Hypothesis: survival improves in later years of the HAART era
- Correlation of 3 routine serum markers with new HIV diagnosis vs. patients who tested HIV-negative:

	New HIV Diagnosis 1997 – 1999 n = 65	New HIV Diagnosis 2000-2002 n = 47	p
Age (years), mean	48.5	54.5	0.021
Age ≥ 50 years, No. (%)	27 (41.5%)	35 (74.5%)	0.001
Age ≥ 65 years, No. (%)	8 (12.3%)	8 (17.0%)	0.48
Female Sex, No. (%)	2 (3.1%)	0 (0%)	0.51
Black Race, No. (%)	47 (72.3%)	33 (71.7%)	0.95
Hispanic/Latino Ethnicity, No. (%)	15 (23.1%)	10 (21.3%)	0.82

Steady increase in age at Dx over the years

Survival

Newly diagnosed HIV[+], n=112



Cox Proportionate Hazard Model of Survival

Factor	Uni- variate p	Hazard Ratio	95% Confidence Interval	Multi- variate p	Hazard Ratio	95% Confidence Interval
Age ≥ 50 years	0.019	0.33	0.129 – 0.835	0.043	0.40	0.164 – 0.962
HIV Diagnosis in 2000 – 2002	0.037	0.38	0.150 – 0.944	0.12		
AIDS-defining illness	0.096	0.49	0.208 – 1.136	0.10		
HIV-related symptoms	0.27	0.63	0.273 – 1.434			

Only age is associated with survival, but not year of diagnosis

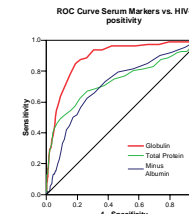
Serum Marker Total Globulin (=Total Protein-Albumin)

	Newly diagnosed HIV[+] patients n = 112	Patients who tested HIV[-] n = 2,469	p
Total protein, mean (g/dL)	8.11	7.21	<0.001
Albumin, mean (g/dL)	3.29	3.84	<0.001
Calculated total globulin, mean (g/dL)	3.38	4.83	<0.001

AUROC Curve (95% C.I.)

Total Globulin **0.888** (0.86-0.92)
 Total Protein 0.737 (0.60-0.80)
 Minus Albumin 0.714 (0.66-0.76)

Total Globulin is a significantly better predictor of new HIV diagnosis than TP or -albumin.



Total Globulin	Sensitivity	Specificity	PPV	NPV
Cutoff ≥ 3.4 g/dL	96.4%	57.6%	9.6%	99.7%
Cutoff ≥ 4.0 g/dL	78.6%	84.3%	19.0%	98.8%
Cutoff ≥ 5.0 g/dL	36.6%	96.1%	30.6%	97.0%
Cutoff ≥ 6.0 g/dL	16.1%	99.1%	45.0%	96.2%
Cutoff ≥ 7.0 g/dL	6.3%	99.7%	50.0%	95.6%

Serum Markers Anti-HBc and Anti-HCV

	Sensitivity	Specificity	PPV	NPV	P HIV[+] vs [-]
Anti-HBc[+] in HIV[+] new Dx in HIV[-]	69.9%	53.3%	9.3%	96.3%	<0.001
Anti-HCV[+] in HIV[+] new Dx in HIV[-]	30.5%			37.6%	0.14

Being anti-HBc[+] is associated with new HIV diagnosis, but being anti-HCV[-] is not.

Summary and Conclusion

• Age at HIV diagnosis is increasing over the years, and this leads to higher mortality in the later years of the HAART era, contradicting our hypothesis

• The serum markers Total Globulin and being Anti-HBc[+] are associated with a new diagnosis of HIV infection