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## Background

- HIV-infected patients with HCC who have HIV RNA levels of <400 copies/ml have improved survival.
- It is unknown what influence CD4+ cell counts have on the outcome of HCC.

## Methods

- Retrospective analysis in 29 centers in 7 countries (dark gray on map):

- North America: Canada and United States
- South America: Argentina and Brazil
- Europe: Germany, Spain and United Kingdom



Sites from countries in light gray are awaiting IRB/EC approval

- All HCC cases in HIV-infected patients from 1995-2010 with data on initial presentation.

- N=159 total of 163 patients, of whom 4 had no CD4+ cell data

- Diagnosis by AASLD criteria (Bruix & Sherman, Hepatology, 2005)

- Patients were divided into

**CD4+ cells ≥200/mm<sup>3</sup> n=112 (70%)**  
**CD4+ cells <200/mm<sup>3</sup> n= 47 (30%)**

To contribute your cases of HCC in HIV patients for further studies, please contact:  
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## Patient Characteristics

	CD4+ cells ≥200/mm <sup>3</sup> n=112	CD4+ cells <200/mm <sup>3</sup> n=47	P
Age (yrs), Mean ± SD	51.4 (±7.9)	51.5 (±8.3)	0.96
Male Sex	93 (95%)	57 (93%)	0.73
Race/Ethnicity			
White	52 (53%)	22 (36%)	0.12
Black	32 (33%)	31 (51%)	
Latino	11 (11%)	7 (11%)	
Asian + other	3 (3%)	1 (2%)	
Time of HCC Diagnosis Date, Median	Apr-2004	Jan-2002	0.001
Etiology of HCC			
Chronic Hepatitis C	70 (71%)	48 (79%)	0.66
Chronic Hepatitis B	26 (27%)	12 (20%)	
Non-Viral (Alcohol, NASH)	2 (2%)	1 (1.6%)	
Excessive Alcohol Consumption	n=91 30 (33%)	n=57 28 (49%)	0.05
Child-Turcotte-Pugh Score, Mean ± SD	6.31	7.41	<0.001
Stage A	64 (65%)	25 (41%)	0.003
Stage B	29 (30%)	25 (41%)	
Stage C	5 (5%)	11 (18%)	
Prior HCC Screening	60 (61%)	25 (41%)	0.013
CD4+ Cells, Mean (per mcl)	319	320	0.13

## HCC Tumor Characteristics

	CD4+ cells ≥200/mm <sup>3</sup> n=112	CD4+ cells <200/mm <sup>3</sup> n=47	P
Hepatic Lesions			
Solitary Tumors	59 (53%)	22 (47%)	0.79
Multiple tumors	44 (39%)	21 (45%)	
Diffusely Infiltrative Tumors	9 (8%)	4 (8%)	
Median Size Largest Lesion (cm), Range	4.0 (0.5-16)	4.5 (1.5-20)	0.32
Portal Vein Thrombosis	22 (20%)	9 (19%)	0.94
Extrahepatic Metastases	17 (15%)	7 (15%)	0.96
AFP level			
Median (ng/ml)	137	1,130	0.006
Normal (< ULN)	17 (16%)	1 (2.3%)	0.019

## HCC Staging

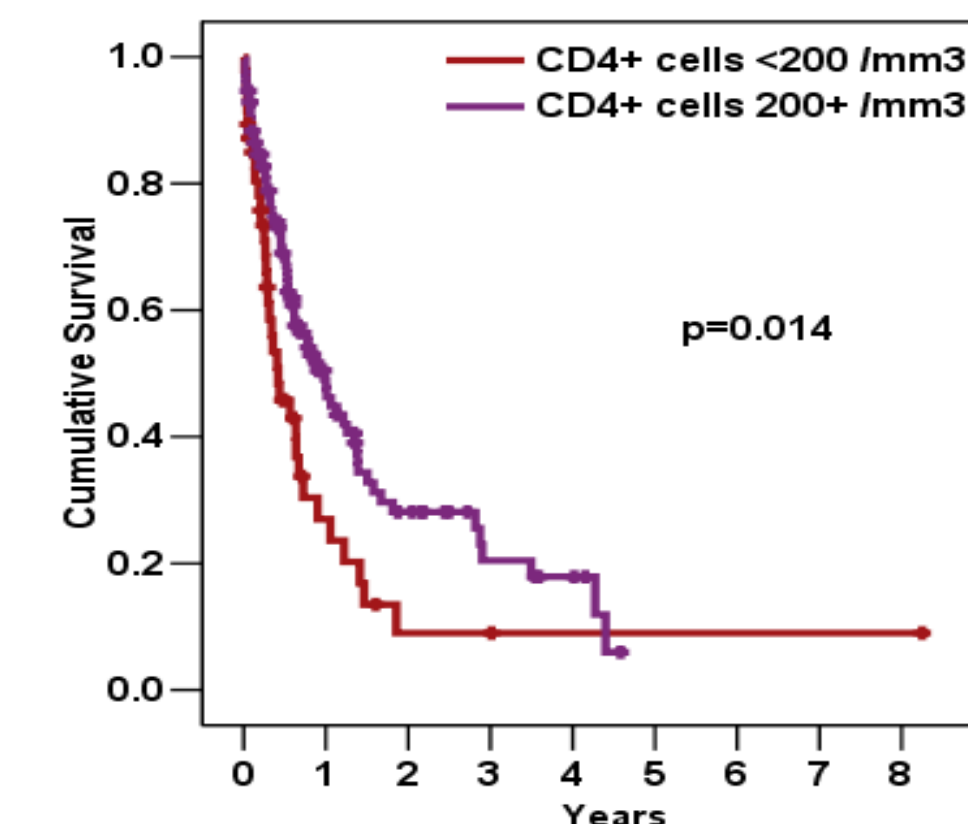
	CD4+ cells ≥200/mm <sup>3</sup> n=112	CD4+ cells <200/mm <sup>3</sup> n=47	P
BCLC Stage, n (%)			
A	35 (31%)	12 (26%)	0.52
B	22 (20%)	11 (23%)	
C } Advanced,	42 (37%)	15 (32%)	
D } Incurable	13 (12%)	9 (19%)	
CLIP Score, Mean ±SD	1.71 (±1.3)	2.36 (±1.5)	0.010

## HCC Therapy

	CD4+ cells ≥200/mm <sup>3</sup> n=112	CD4+ cells <200/mm <sup>3</sup> n=47	P
Potentially Curative Therapy	36 (32%)	11 (23%)	0.008
Radiofrequency Ablation (RFA)	18	3	
Ethanol Injections	4	6	
Surgical Resection	11	2	
Liver Transplantation	3	0	
Effective, Non-Curative Therapy	36 (32%)	7 (15%)	0.003
Transarterial Chemoembolization	27	5	
Sorafenib	9	2	
No Therapy	40 (36%)	29 (62%)	
Any Effective Therapy	72 (64%)	18 (38%)	

At Risk:  
CD4+ <200 /mm<sup>3</sup> 47 8 2 2 1 1 1 1 1  
CD4+ ≥200+ /mm<sup>3</sup> 112 35 17 8 5

## Survival



Median survival

CD4+ cells <200 /mm<sup>3</sup> 5.0 months  
CD4+ cells ≥200+ /mm<sup>3</sup> 11.7 months

## Multi-Variable Cox Regression Analysis of Survival

Factor	Univariate P	Multi-variable P	Multi-var. Hazard Ratio	95% Confidence Interval
Initial Presentation through Screening	<0.001	<0.001	3.02	1.8 – 5.0
Effective HCC Therapy	<0.001	<0.001	0.42	0.26 – 0.68
BCLC stages A&B vs. C&D	<0.001	<0.001	0.40	0.25 – 0.65
HIV RNA Level (per log <sub>10</sub> copies/ml)	<0.001	0.005	1.25	1.07 – 1.46
Diagnosis on or after Jan-2005	0.001	0.048	1.58	1.003 – 2.47
South America vs. Europe/North America	0.12	0.048	0.44	0.20 – 0.99
Age (per 10 years)	0.057	NS		
CD4+ Cells (per 100/mm <sup>3</sup> )	0.038	NS		

## Summary and Conclusion

Patients with CD4+ cells <200 /mm<sup>3</sup> compared to those with ≥200+ /mm<sup>3</sup>:

- Have higher CTP scores and stages
- Have higher AFP levels
- Receive HCC therapy less often
- Have worse survival, but in multivariable Cox analysis, this is explained by higher HIV RNA levels.

\* This abstract is dedicated to **Edmund J. Bini, MD, MPH (1967 – 2010)**, who contributed greatly to this study, and who would have been a co-author

