



# CD4 cell count changes following acute HCV infection in chronically HIV infected patients

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## Background

- Outbreaks of acute HCV among HIV-positive men who have sex with men (MSM) have been reported.
- HCV co-infection contributes to morbidity and mortality and complicates patient management.
- Limited data is available on the impact of acute HCV co-infection on CD4 cell counts during chronic HIV infection.
- Objective: To study changes in CD4 cell counts before and after acute HCV infection but before the start of anti-HCV therapy, among both cART treated and untreated chronically HIV-infected patients.

## Methods

### HIV-1 infected MSM selected from the national observational ATHENA cohort with:

- Acute HCV co-infection: a negative HCV RNA test result followed within 1 year by a positive HCV RNA test result (midpoint = estimated date of HCV infection).
- At least 6 months between HIV diagnosis and HCV infection.

### Outcome:

- CD4 cell counts 2 years prior and 1 year after the date of HCV infection.
- CD4 cell counts sampled after the start of anti-HCV treatment or after a change in the HIV treatment status (change from HIV untreated to treated with any HIV-antiretroviral or vice-versa) were censored.

### Statistical analysis:

- CD4 cell counts were longitudinally modelled using:
  - mixed effects models.
  - pattern-mixture models (to account for possible bias arising from censoring CD4 cell counts after start of anti-HCV treatment). This model includes an interaction term with CD4 slope after HCV infection and timing of anti-HCV treatment initiation (< and ≥6 months from HCV infection).
- Slopes were allowed to change at date of HCV seroconversion.
- A random intercept (representing CD4 cell counts at HCV infection) and 2 random slopes for each patient were included.
- HIV treatment status was included in all models.

## Results

- Characteristics at HCV co-infection of the 39 included patients are shown in Table 1.
- Analyses included 360 CD4 cell counts.

	N(%)
<b>Total</b>	39 (100)
<b>HCV genotype</b>	
1	22 (56)
2	2 (5)
4	7 (18)
not determined	8 (21)
<b>On cART</b>	29 (74%)
	<b>Median (IQR)</b>
<b>Known duration of HIV (years)</b>	5.9 (2.1-10.1)
<b>Last CD4 cell count prior to HCV infection (cells/mm<sup>3</sup>)</b>	480 (390-620)
<b>Year of HCV infection</b>	08 (06-09)
<b>Months between last negative first positive HCV RNA test</b>	4.5 (3.3-6.4)

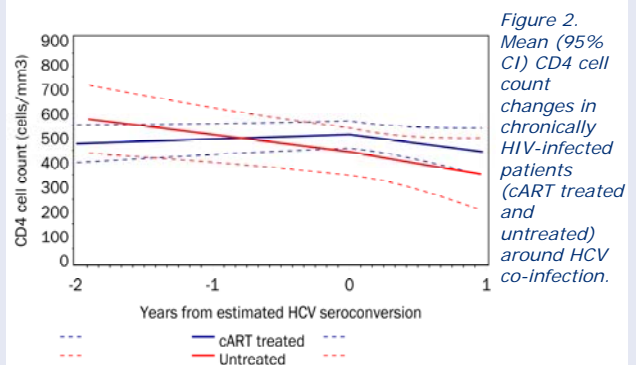
Table 1. Characteristics at estimated HCV infection.

- Anti-HCV treatment within 6 months from HCV diagnosis in 17 patients (44%).

	Mixed effects model	Pattern-mixture model
<b>CD4 cell count at HCV infection (cells/mm<sup>3</sup>)</b>		
On cART	514 (458-570)	515 (461-568)
HIV-untreated	445 (348-541)	448 (357-540)
<b>Slope CD4 cell count prior to HCV infection (cells/mm<sup>3</sup>/yr)</b>		
On cART	18 (-5, 42)	19 (-5, 43)
HIV-untreated	-70 (-118, -21)	-65 (-114, -16)
<b>Slope CD4 cell count after HCV infection (cells/mm<sup>3</sup>/yr)</b>		
On cART	-72 (-163, 20)	-82 (-198, 35)
HIV-untreated	-95 (-228, 38)	-134 (-200, 46)

Table 2. Estimates of mean (95% CI) CD4 cell count at HCV co-infection and changes in CD4 cell counts around HCV co-infection.

- In cART treated patients differences in slope before and after HCV infection were 90 cells/mm<sup>3</sup> (-179, 0; p=0.04) for the mixed effects model and -101 cells/mm<sup>3</sup> (-219,17; p=0.09) for the pattern-mixture model.



## Conclusions

- Acute HCV infection in cART-treated chronically HIV-infected patients may be associated with a decrease in CD4 cell counts.
- The small number of patients limited subgroup analyses.