Risk of diabetes in HIV-infected patients is associated with cirrhosis but not with chronic HCV co-infection in a French Nationwide HIV cohort

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INTRODUCTION

Both HIV and hepatitis C (HCV) infections have been reportedly associated with a higher risk of diabetes mellitus (DM) but results are conflicting. The aim of this study was to determine whether there is an association between chronic HCV and the incidence of DM, and to study the role of factors such as cirrhosis, IFN-based HCV therapy, sustained virologic response (SVR) and chronic hepatitis B (HBV) infection among patients living with HIV (PLHIV) followed in a large French multicenter cohort in the combination antiretroviral therapy (cART) era.

METHODS

All PLHIV followed up in the Dat'AIDS cohort were eligible. Patients with preexisting DM or a diagnosis of DM within six months following HIV diagnosis, patients with spontaneous HCV cure or with no HCV serology were excluded. The following data were collected: gender, age, BMI, history of and first date of DM (ICD-10), AIDS status, use of cART, duration of cART, CD4 lymphocyte count, nadir CD4 lymphocyte count, HIV-RNA viral load, presence of lipodystrophy, duration of HCV infection (from the time of symptoms in case of acute hepatitis, or from the time of first transfusion, first narcotic injection or first positive HCV serology in subjects infected through sexual contact with no history of acute hepatitis), IFN-based HCV-treatment prior to DM, HCV SVR, cirrhosis, chronic hepatitis B virus (HBV) infection. Duration of HCV infection, BMI, CD4 cell count and HIV viral load were constructed as time varying variables. Cox models for survival analysis were used to study the time to occurrence of DM.

RESULTS

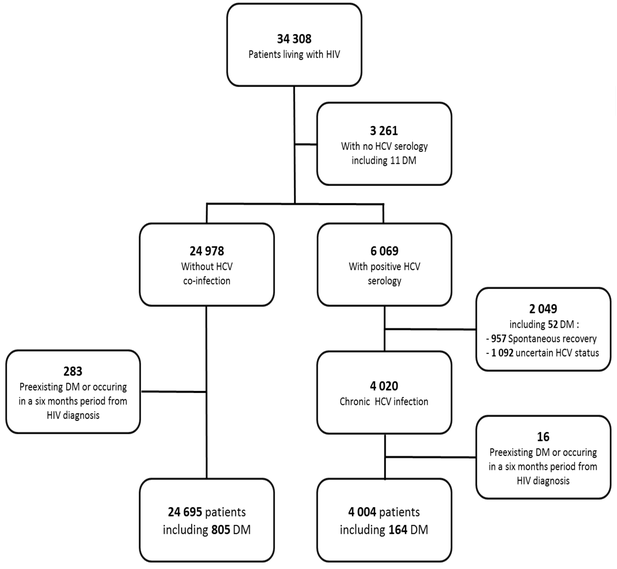

Figure 1: Flowchart of the Dat'aids cohort

Table 1: Characteristics of the 28,699 patients from the DAT'AIDS cohort (mean ±SD or n(%))

Characteristics	n=28 699
HIV follow-up (years)	12.4 ± 7.9
Age at HIV diagnosis (years)	33.7 ± 10.9
Male	20 504 (71.4)
AIDS	7 045 (24.6)
CD4+ T-cell nadir (/mm^3)	238 ± 187
CD4+ T-cell nadir < 200/mm^3	13 276 (46.8)
cART	26 019 (90.6)
cART duration (years)	9.2 ± 6.0
Lipodystrophy	5 192 (18.1)
Chronic HCV-infection	4 004 (13.9)
Duration (years)	12.5 ± 8.1
SVR	697 (17.4)
IFN-based HCV therapy	2 010 (50.2)
Cirrhosis	928 (3.2)
DM	969 (3.4)
DM lead time (years)	11.0 ± 6.4
Chronic HBV-infection	1 117 (4.1)

Table 2: Predictors of DM Multivariable analyze* (adjusted on year of HIV diagnosis and HCV duration of infection) - HR: hazard ratio, 95% CI: 95% confidence interval

Predictors found	HR	95% CI	p-value
HCV duration of exposure (years)	0.994	0.979-1.009	0.4325
Age (years)			
< 30	1	-	-
30-50	3.817	3.236-4.504	<0.0001
>50	9.9	7.936-12.345	<0.0001
BMI (kg/m²)			
18.5-25	1	-	-
<18.5	0.941	0.707-1.251	0.6743
25-30	2.410	2.082-2.790	<0.0001
>30	3.063	2.516-3.728	<0.0001
cART duration (years)	0.843	0.833-0.854	<0.0001
Presence of cirrhosis	2.262	1.795-2.849	<0.0001
AIDS status	1.355	1.172-1.564	<0.0001
CD4+ T-cell Nadir ≤200/mm3	1.499	1.296-1.733	<0.0001
Detectable HIV-RNA viral load	1.318	1.050-1.654	0.0172

Table 3: Subgroup analysis of time dependent HCV SVR (4004 VHC co-infected patients and 697 events adjusted on year of HIV diagnosis and HCV duration of infection)

Predictor studied	HR	95% CI	p-value
Sustained virologic response	1.09	0.76-1.57	0.65

CONCLUSION

In conclusion, our study shows that in PLHIV, cirrhosis is associated with an increased risk of DM, but not chronic HCV infection or duration of HCV infection. Furthermore, in the late cART era, the duration of cART was no longer associated with a higher risk of DM. Apart from HIV factors related to immunodeficiency (AIDS status, low nadir CD4 cell count and detectable HIV viral load), PLHIV share the same traditional risk factors for DM, such as age and BMI, as compared to the general population.

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