HIV as a risk factor of airwav obstructive disease

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Background:

- **The conjunction of small airway disease with parenchymal destruction results in airflow obstruction (AO) and possibly chronic obstructive pulmonary disease (COPD)**
- **We previously showed high prevalence of COPD (26% using the GOLD criteria) in an all-smoking cohort of 338 HIV-individuals aged ≥40 years (1). Studies have suggested increased prevalence of COPD in HIV-individuals (2), with some studies showing an association of COPD with HIV-related factors (2-3), and others not (4).**
- **The objective of our study was to compare the prevalence of AO in HIV-individuals with matched individuals from the general population, and to determine whether HIV-status was an independent factor of AO.**

Methods:

- **HIV-infected individuals were included in the ANRS EP48 HIV-CHEST study (NCT01207986), a multicentre, French, lung cancer screening study with chest CT (5). HIV-uninfected subjects were from the CONSTANCES cohort, an ongoing epidemiological cohort representative of the French general population (http://www.constances.fr/). All individuals were smokers ≥ 20 pack-years, possibly stopped within the previous 3 years, and aged ≥ 40 years. HIV-individuals also had a CD4 T-lymphocyte nadir count < 350/µL, and a last CD4 T-lymphocyte count > 100/µL.**
- **Subjects from both cohorts underwent spirometry without administration of a bronchodilator. The primary endpoint, defining AO, was the Forced Expiratory Volume in 1 second (FEV1)/Forced Vital Capacity (FVC) < 0.70 and a FEV1 measure < 80 % of the theoretical value (a published proxy of significant AO) (6).**
- **Each HIV-individual was randomly matched by age and gender with two individuals from the CONSTANCES cohort. A logistic regression model evaluated the association of AO with age, gender, HIV status, Body Mass Index, HCV status, cannabis use, smoking (pack-years) and former smoking.**

Results:

- **Primary characteristics of both populations are shown in table 1. 68 (19%) of HIV-infected versus 60 (9%) of HIV-negative individuals had AO.**
- **In the primary unadjusted model, HIV was significantly associated with AO (Odd Ratio : 2.57, 95% Confidence Interval (CI) : 1.76- 3.74). Results of the multivariate analysis are shown in table 2. The only factors associated with AO were HIV, age (per 10 years increase), and smoking (per 5 pack-years increase).**

Discussion and Conclusion:

- **Age and smoking are well known factors of AO in the general population, as found in our study.**
- **In our age and gender matched study, prevalence of AO was higher in HIV-infected subjects, and HIV was independently associated with AO.**
- **Mechanisms underlying this association should be further explored.**

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	HIV negative individuals n=702	HIV positive individuals n=351
Age (years), median (Q1-Q3)	50 (46-54)	50 (46-54)
Woman, n (%)	122 (17%)	61 (17%)
BMI, median (Q1-Q3)	26 (23-28)	23 (20-25)
Smoking (pack-years), median (Q1-Q3)	28 (23-35)	30 (25-39)
Smoking cessation (< 3 years), n (%)	234 (33%)	30 (9%)
History of cannabis inhalation, n (%)	67 (10%)	125 (36%)
HCV, n (%)	13 (2%)*	106 (30%)
T-CD4 lymphocyte level (cells/µl), median (Q1-Q3)	NA	573 (395-767)
CD4 nadir level (cells/µl), median (Q1-Q3)	NA	174 (75-259)
History of AIDS, n (%)	NA	104 (30%)
Viral load < 50 copies/ml, n (%)	NA	311 (89%)
History of intravenous drug use, n (%)	NA	94 (27%)

Table 1. Primary characteristics of the HIV-infected and uninfected subjects. NA : not applicable.
*** Data available for 686 subjects.**

Variable	OR	IC 95%
HIV	**1.72**	**1.08 – 2.73**
Age (per 10 years increase)	**1.77**	**1.28 – 2.43**
Gender (woman)	0.73	0.41 – 1.28
BMI	0.97	0.92 - 1.02
Smoking (per 5 pack-years increase)	**1.11**	**1.03 - 1.20**
Ceased smoking	0.78	0.46 -1.31
Cannabis consumption	1.43	0.87 – 2.35
HCV positive status	1.37	0.78 – 2.41

Table 2. Factors associated with airway obstruction (multivariate analysis)

(1) Makinson Eur Respir J 2015; (2) Crothers Am J Respir Crit Care Med 2011; (3) Drummond Thorax 2012; (4) Kunisaki Lancet respiratory 2016; (5) Makinson AIDS 2016; (6) Bohadana Chest 2005