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Underdiagnosis and suboptimal care of diabetes mellitus in a French HIV-infected cohort in 2016

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Background

- Diabetes mellitus (DM) is common among HIV-infected people and as in the general population is associated with comorbidities.

Brown T.T. et al., Arch Intern Med. 2005

Morlat P. et al., AIDS. 2014

Capeau J. et al., AIDS. 2012

- In France, hemoglobin A1C (HbA1c) which measures the percentage of hemoglobin that is glycated, is the primary index of glycemic control in patients with DM, but is not recommended for DM diagnosis.

Slama L. et al., J Antimicrob Chemother. 2014

- In addition to fasting glycemia (≥ 7 mmol/L, twice), it might be necessary to use HbA1c ($\geq 6.5\%$) to diagnose DM and even to consider a lower HbA1c level target to prevent complications in HIV infected people.

Slama L. et al., J Antimicrob Chemother. 2014

Monroe A. et al., CID. 2015

Purpose

To describe diagnosis, treatment and follow-up of DM among HIV-infected persons, in a large French cohort

Study design

- OVIHD: Ongoing prospective study of HIV infected persons followed since 2011 at Hotel-Dieu hospital, Paris, France.
- Participants attend annual visits that include physical examination and centralized blood collection for laboratory testing and storage.
- We used data of 1669 HIV infected participants between 2011 and 2016.
- We included participants with DM defined as a 8 hours fasting glycemia (FG) \geq 7.0 mmol/l twice, or HbA1c \geq 6.5%, or current antidiabetic drugs exposure, or personal history of DM reported by the patient.

French Authority of health. Diabetes. Octobre 2014. <http://www.has.sante.fr>
American Diabetes Association. Diabetes care. Jan. 2010.

- We also looked at cardiovascular risk factors associated with DM.
- FG and HbA1c measurements were centralized at Cochin hospital (Paris).

Statistical Methods



- Cross sectional study nested in the OVIHD cohort.
- Data were collected from the NADIS database which is a national French computerized patients file.
- Chi-squared tests (χ^2) and Student test were used for the statistical analysis.

Characteristics of the OVIHD cohort (n =1669) at baseline

Variables	Category	Non diabetics	Diabetics	p value
		N= 1540 (%)	N=129 (%)	
Sex	men	1075 (69.8)	96 (72.7)	> 0.05
Age (years)	< 40	452 (29.3)	6 (4.5)	< 0.05
	40-49	403 (26.3)	23 (17.4)	
	50-64	582 (37.8)	69 (52.3)	
	≥ 65	103 (6.7)	34 (25.8)	
Ethnic origins	caucasian	869 (56.5)	67 (50.7)	> 0.05
	black	538 (35.0)	52 (39.4)	
	others	132 (8.5)	13 (9.9)	
BMI (kg/m ²)	>30	75 (4.8)	28 (21.2)	< 0.05
	26-30	272 (17.7)	54 (40.9)	
	< 26	1193 (77.5)	50 (37.9)	
HIV transmission	heterosexual	562 (36.5)	73 (55.3)	<0.05
	MSM	672 (43.6)	44 (33.3)	
	others	306 (20.0)	15 (11.4)	
Cumulative years of HIV-exposure	< 5	304 (19.8)	9 (6.8)	<0.05
	5-10	238 (15.4)	20 (15.1)	
	> 10	972 (63.1)	103 (78.0)	
CDC, stage	C	296 (19.3)	26 (19.7)	>0.05
Nadir CD4 T cell count (cells/mm ³)	<200	578 (37.8)	63 (47.7)	>0.05
Current CD4 T cell count (cells/mm ³)	>500	1048 (68.0)	92 (72.3)	>0.05
Last viral load (copies/mL)	<50	1382 (89.7)	119 (90.1)	>0.05

Cardiovascular risk factors among the 129 DM participants

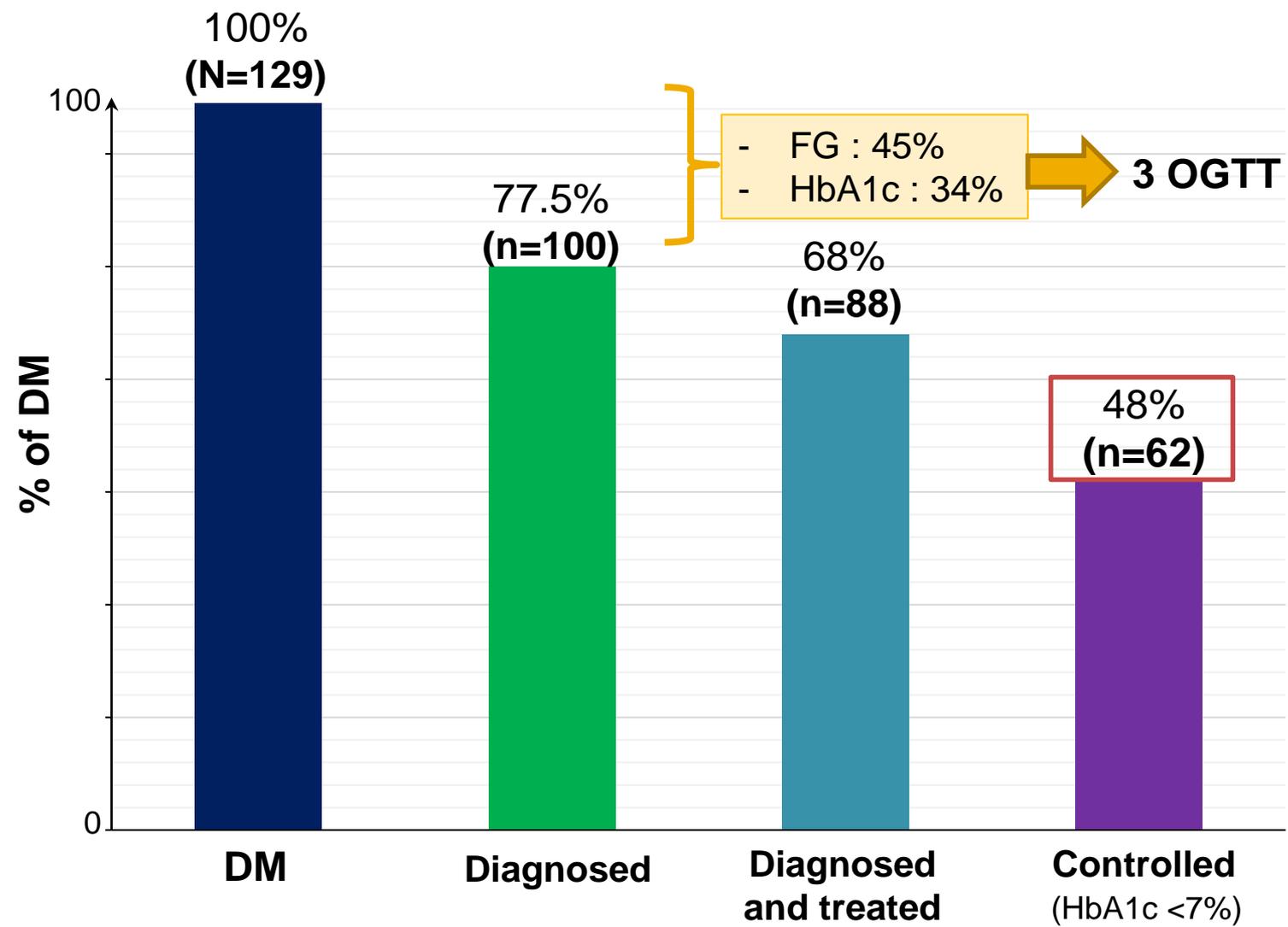
Cardiovascular risk factors	N=129	n (%)
Smoking status	Current	63 (48.8)
History of cardiovascular diseases ^a	yes	18 (14.0)
Metabolic abnormalities	Dyslipidemia ^b	58 (45.0)
	Clinical lipodystrophy	72 (55.8)
High blood pressure ^c		80 (62.0)
Estimated glomerular filtration rate (MDRD; ml/min)	< 60	27 (21.0)

^a History of cardiovascular diseases was defined as: personal stroke or heart attack, previous family 'first degree cardiovascular event at age 55 or below for male or below 65 years old for female were also considered as cardiovascular risk factors.

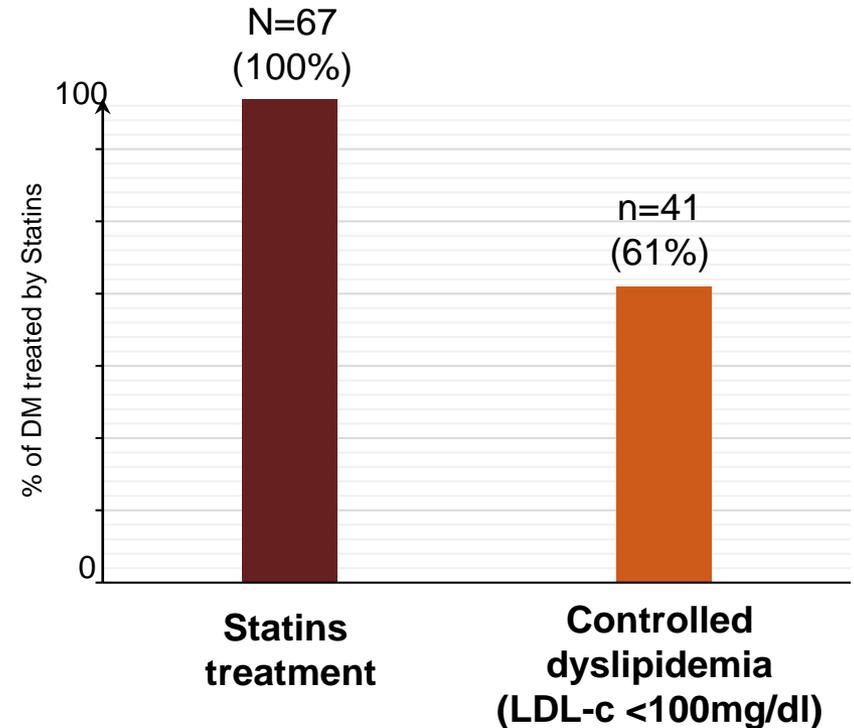
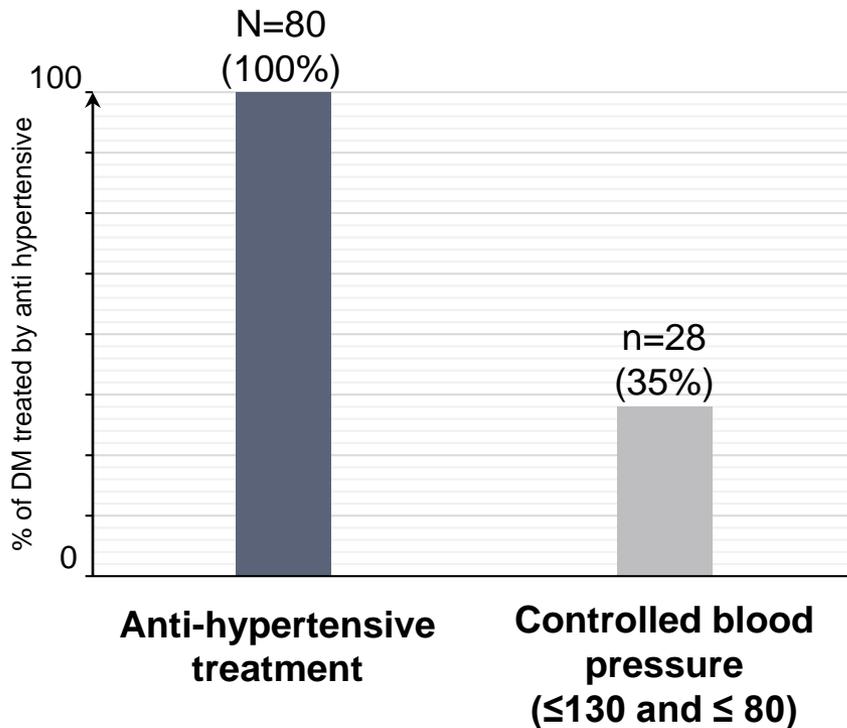
^b Dyslipidemia was defined as participants treated by statins.

^c High blood pressure was defined as participants treated by anti-hypertensive treatment.

Cascade of DM care: From diagnosis to control



Cardiovascular risk factors associated with DM



- Dyslipidemia was defined as participants treated by statins.
- High blood pressure was defined as participants treated by anti-hypertensive treatment.

Summary

- DM appears to be underdiagnosed among HIV-infected patients.
 - Insufficient awareness of clinicians
 - HbA1c may be recommended as a tool for DM diagnosis.
- DM treatment is suboptimal.
 - Increase early interventions
 - In addition, more stringent control of treated DM to reduce cardiovascular events.
- High blood pressure and dyslipidemia appear under controlled.
- Limitations : Small sample size and cross-sectional design.

Perspectives

- Despite a very good HIV control (90% with HIV-RNA \leq 50 copies/mL), it is necessary to :
 - increase awareness of HIV care providers on metabolic issues
 - include HbA1c as a tool for DM diagnosis
 - monitor cardiovascular and metabolic risks in HIV-infected patients
- However, DM control in this tightly controlled population is favorable compared to the general population.

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