ASSOCIATION BETWEEN HIV AND THE PREVALENCE OF ATRIAL FIBRILLATION AND ATRIAL FLUTTER.

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BACKGROUND

- People living with HIV (HIV+) are at *increased* risk for cardiovascular disease
- Some studies demonstrate an increased risk for atrial fibrillation in people living with HIV, although these results are not consistent.
- The purpose of this study was to evaluate the association between HIV serostatus and the prevalence of atrial fibrillation and atrial flutter (AF/AFL) on resting EKG/Zio patch in the Multicenter AIDS Cohort Study (MACS)

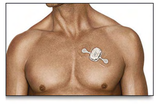
METHODS

- **Study design**
  Cross-sectional study nested in the Multicenter AIDS Cohort Study (MACS).
- **Population:**
  MACS is an ongoing prospective cohort of HIV+ and HIV- men who have sex with men (MSM) with multiple centers and waves of enrollment.
  - Baltimore/DC, Pittsburgh, Los Angeles, Chicago.
  - enrollment 1984-1985, 1987-1991 and 2001-2003.
  Semi-annual research visits with standardized interviews, physical examinations and blood and urine collection.
- **Source data/Outcome ascertainment**:

Analytical sample included 1669 men who completed resting 12 lead EKG and/or ambulatory EKG monitoring between 2015 and 2017.

Ambulatory EKG Monitoring: Zio patch (ZioXT, iRhythm Technologies Inc) - non-invasive single lead device worn as a skin adhesive patch with continuous ambulatory EKG monitor for up to 14 days.

Both groups had median Zio patch wear time of 13 days (5.9 - 14.0).



Statistics: Multivariable logistic regression analysis:

- **Outcome variable**: prevalence of atrial fibrillation and atrial flutter on resting EKG and/or Zio patch.
- **Primary predictor**- HIV serostatus.
- **Adjustment for demographics**:
  - study center, age (continuous) and race.
- **Additional adjustment** for cardiovascular disease risk factors
  -body mass index, cumulative pack year of smoking, cocaine use since last visit, use of medications to treat hypertension or diabetes, heavy alcohol use (>13 drinks/week), fasting glucose level and systolic blood pressure.

HIV serostatus was **not associated** *with prevalent atrial* fibrillation.

Table 1: Study population.

	HIV-uninfected (n=777)	HIV-infected (n=892)	p value
Age (years); median (IQR)	61.7 (55.0, 68.0)	55.5 (47.6, 62.2)	<0.001
Race			<0.001
Caucasian	73.0 %	51.5 %	
African American	17.9 %	30.6 %	
Hispanic /Other	9.1 %	17.9 %	
Cumulative pk-yrs smoking	0.3 (0, 19.7)	2.4 (0, 20.3)	0.043
Alcohol (> 13 drinks/week	9.9 %	7.4 %	0.024
Systolic BP (mm Hg)	131 (121, 141)	128 (118, 138)	<0.001
On hypertension medication	39.5 %	37.0 %	0.31
On diabetes medication	10.2 %	10.8 %	0.70
On cholesterol medication	37.6 %	36.8 %	0.72
Fasting glucose (mg/dL)	93 (86, 100)	94 (86, 103)	0.16
Cocaine use since last visit	6.3 %	10.7%	0.001
HIV factors			
HIV RNA viral load <20 copies/mL		83.7 %	
CD4+ T cell count (cells/mm^3)		681 (501, 889)	
Nadir CD4+ (cells/mm^3)		322 (207, 456)	
On HAART		90.8 %	
Duration of HAART (years)		12.5 (5.0,16.8)	
History of clinical AIDS		9.9 %	

Percent % or median (interquartile range)

Table 2: Atrial fibrillation and flutter, by HIV serostatus.

	HIV-uninfected (n=777) N (%)	HIV-infected (n=892) N (%)	p value
Atrial fibrillation or Atrial flutter	25 (3.2)	12 (1.3)	0.01
Atrial flutter	1 (0.1)	1 (0.1)	0.92
Atrial fibrillation	25 (3.2)	11 (1.2)	0.007

Table 3: Unadjusted and adjusted odds ratio of AF/AFL.

	Unadjusted odds ratio (95% C.I), p value n=1669	Adjusted Odds ratio (95% C.I), p value n=1269
HIV-infected	**0.41 (0.03-0.82), p= 0.01**	0.88 (0.34-2.24), p=0.79
Age per year	**1.10 (1.06-1.14), p<0.001**	**1.06 (1.00-1.03) p=0.04**
Race Category Caucasian Non-Caucasian	 Reference **0.04 (0.01-0.31), p=0.002**	 Reference Omitted
Body mass index (kg/m^2)		1.00 (0.93-1.10), p=0.79
Alcohol use >13 drinks per week		0.61 (0.14-2.70), p=0.51
Cumulative pack-year of smoking		0.98 (0.96-1.00), p=0.10
Cocaine use since last visit		Omitted
Systolic blood pressure (mm Hg)		1.00 (0.97-1.02), p=0.75
Fasting glucose (mg/dL)		**1.02 (1.00-1.05), p=0.04**
On hypertension medications		2.25 (0.87-5.86), p=0.96
On diabetes medications		0.18 (0.02-1.53), p=0.12

RESULTS

- AF/AFL was **present in 12 (1.3%)** HIV+ men and **25 (3.2%)** HIV- men.
- There was only **1 case** of AF/AFL **in African-Americans**, and **36 cases** in **Caucasians** (2.7% vs 97.3% p<0.001).
- There was a **lower odds** of AF/AFL among HIV+ compared to HIV- men **in unadjusted analyses (odds ratio, 0.41; 95% confidence interval [CI], 0.03-0.82; p= 0.012**).
- There was **no association** between the odds of AF/AFL and HIV serostatus after **adjusting for age, race, and study center** (odds ratio, 0.79; 95% CI, 0.38 -1.63; p= 0.53) and after further **adjustment for CVD risk factors** (**odds ratio, 0.88; 95% CI, 0.34 - 2.24; p=0.79).**

Limitations:

- Study included only men
  - results may not be applicable to women
- Could not study factors associated with AF/AFL in PLWH due to low prevalence.

Strengths:

- Similarity of risk profile and behavior in the HIV+ and HIV- men
- Presence of HIV- comparison group.
- Use of resting EKG and Zio patch for outcome ascertainment
- as opposed to physician dependent ICD coding.

CONCLUSION

- HIV serostatus was **not** associated with prevalent AF/AFL in this cohort of HIV+ men with suppressed viral replication.
- The **prevalence** of AF/AFL was **low**, strongly **associated** with **aging**, and **rare in African-American** men.

Acknowledgements

The authors acknowledge the valuable contributions of the other MACS investigators, staff and participants. The MACS is funded primarily by the National Institute of Allergy and Infectious Diseases (NIAID) [U01-AI35039, U01-AI35040; U01-AI35041; U01-AI35042; and UM1-AI35043], with additional co-funding from the National Heart, Lung, Blood Institute (NHLBI), the National Cancer Institute (NCI), the National Institute on Drug Abuse (NIDA), and the National Institute of Mental Health (NIMH).

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