CORONARY FLOW RESERVE ON DTG/ABC/3TC AT BASELINE AND AFTER SWITCH TO BIC/FTC/TAF

583

Daniel M Huck[1], Brittany Weber[1], Sean Parks[1], Sanjay Divakaran[1], Jenifer M Brown[1], Courtney Bibbo[1], Leanne Barrett[1], Jon Hainer[1], Camden Bay[2], Laurel Martell[1], Laura Kogelman[3], Virginia Triant[4], Jacqueline Chu[4], Nina Lin[5], Kathleen Melbourne[6], Paul E Sax[7], Marcelo Di Carli[1]

[1]Cardiovascular Imaging Program, Departments of Medicine and Radiology, Brigham and Women's Hospital, Harvard Medical School, Boston MA, USA, [2]Departments of Radiology, Brigham and Women's Hospital, Harvard Medical School, Boston MA, USA, [3]Division of Geographic Medicine and Infectious Diseases, Tufts Medical Center, Boston MA, USA, [4]Division of Infectious Diseases, Massachusetts General Hospital, Harvard Medical School, Boston MA, USA, [5]CDivision of Infectious Diseases, Boston Medical Center, Boston MA, USA, [6]HIV Medical Affairs, Gilead Sciences, Foster City, CA, [7]Division of Infectious Diseases, Department of Medicine, Brigham and Women's Hospital, Harvard Medical School, Boston MA, USA

BACKGROUND

- *Do people with HIV have impairment in myocardial blood flow compared to matched people without HIV?*
- *Will switching from the abacavir-containing antiretroviral regimen DTG/ABC/3TC to BIC/FTC/TAF improve myocardial blood flow?*

HIV infection and abacavir-containing antiretroviral regimens associated with

- endothelial inflammation and dysfunction
- increased cardiovascular risk

Positron emission tomography (PET) derived coronary flow reserve (CFR): ratio of peak vasodilator stress to rest myocardial blood flow

- integrates the hemodynamic effects of focal stenosis, diffuse atherosclerosis and microvascular dysfunction
- higher CFR = better coronary vascular health
- powerful marker of cardiovascular risk.

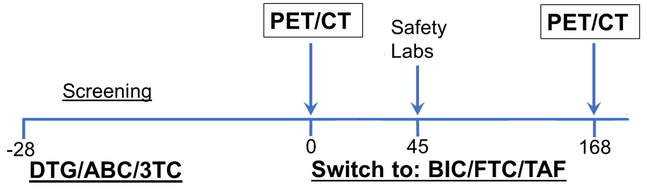
METHODS

Prospective, single-arm, multi-center, open-label trial switching virologically suppressed people with HIV on DTG/ABC/3TC to BIC/FTC/TAF

- Cross-sectional comparison 1:3 matched non-HIV controls

HIV+
Men>45, Women >55
Stable with virologic suppression > 1 year
At least one coronary risk factor (current smoking, dyslipidemia, hypertension, diabetes, obesity, 10-year CV event risk >7.5%)

HIV- Controls
Referred for clinically indicated PET (most with symptoms)
Matching on sex/gender, age, race ethnicity, cardiovascular risk factors (hypertension, diabetes, smoking), coronary artery calcium score



HIV+ had vasodilator-stress and rest PET myocardial perfusion imaging at baseline, then switched to BIC/FTC/TAF for 24-week course prior to repeat PET.

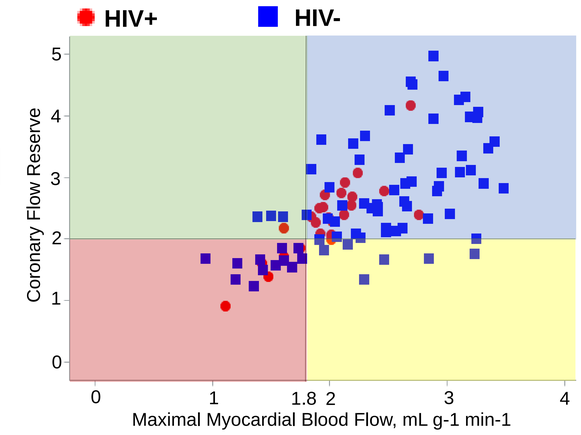
People with HIV (PWH) on DTG/ABC/3TC had statistically significantly l**ower coronary flow reserve** (CFR) at baseline compared to **matched controls without HIV**. There was no significant change in CFR after switching to BIC/FTC/TAF overall; however, **those with an abnormal CFR at baseline** experienced an **increase after switch.**

RESULTS

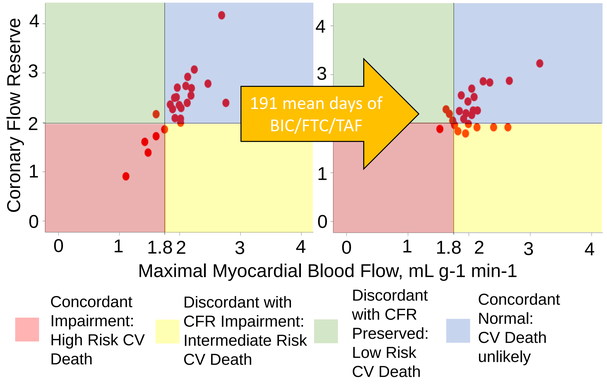
25 PWH were majority male (68%), cisgender (100%) and Black or Hispanic (56%) with mean age of 57 years. Controls were similar.

Characteristic, N (%) or mean ± SD	HIV+ (N=25)	HIV- (N=75)
Demographics		
Gender (cis male)	17 (68%)	51 (68%)
Age, years	57 ± 6	57 ± 6
Race/ethnicity		
Black Non-Hispanic	8 (32%)	24 (32%)
White Non-Hispanic	11 (44%)	37(49%)
White Hispanic	6 (24%)	14 (19%)
Metabolic Risk Factors		
Hypertension	16 (64%)	48 (64%)
Dyslipidemia	13 (52%)	38 (51%)
Diabetes	3 (12%)	10 (13%)
Family history of CAD	8 (33%)	24 (32%)
History of or current smoking	10 (40%)	31 (41%)
BMI, kg/m2	27.7 ± 4.7	33.7 ± 8.9
Coronary artery calcium (CAC)		
Absent	16 (64%)	48 (64%)
Mild or Moderate	7 (28%)	25 (34%)
Severe	2 (8%)	2 (3%)
ASCVD Risk, 10 year (%)	10.1 ± 6.2	10.7 ± 7.7
HIV-related Factors		
HIV Duration, years	20 ± 6	N/A
CD4 Count, cells/mm^3	734 ± 274	N/A
Stress-Test Related Factors		
Systolic Blood Pressure, mmHg	126 ± 23	143 ± 24
Diastolic Blood Pressure, mmHg	70 ± 10	78 ± 12
Heart Rate, beats/minute	62 ± 9	68 ± 11
Left Ventricle Ejection Fraction, %	56 ± 4	68 ± 11
Rest Rate Pressure Product (RPP)	8021 ± 2123	9753 ± 2508
Myocardial Blood Flow (MBF)		
Rest MBF, ml/min/g	0.68 ± 0.13	0.88 ± 0.21
Stress MBF, ml/min/g	1.97 ± 0.37	2.40 ± 0.63
CFR, corrected for rest RPP	2.34 ± 0.62	2.68 ± 0.91

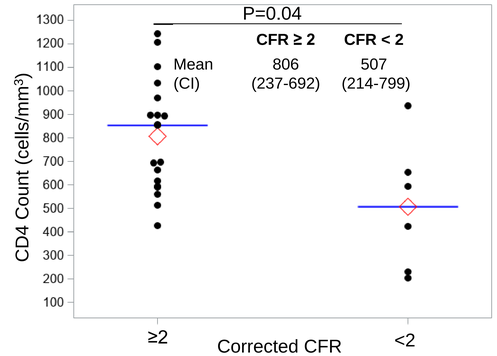
Mean CFR 2.34 (95% CI 2.08-2.60) in HIV+, lower than non-HIV matched patients of 2.68 (95% CI 2.47-2.89, p=0.03).
PWH maintained virologic suppression, with no adverse events



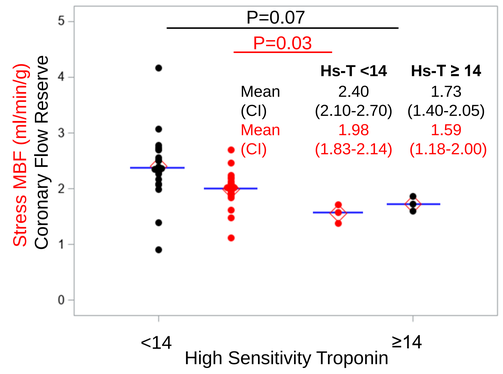
Mean CFR 2.29 (95% CI 2.13-2.45) after mean 6.3 months of BIC/FTC/TAF treatment, unchanged from baseline (p=0.61).



In exploratory analysis, among PWH with reduced CFR at baseline (<2.00, N=6), CFR increased significantly from 1.58 (95% CI 1.17-1.99) to 2.02 (95% CI 1.81-2.22, p=0.02).



Abnormal CFR (<2, N=6) associated with lower CD4 count



Elevated high sensitivity troponin (≥14, N=3) associated with lower CFR and stress myocardial blood flow (MBF)

CONCLUSIONS

- Virologically suppressed asymptomatic PWH on abacavir-containing regimen have subclinical coronary vasomotor dysfunction compared to matched non-HIV controls
- Although switching to BIC/FTC/TAF for 6 months did not improve CFR overall, PWH with low CFR at baseline did have improvement in CFR after switch
  - PWH with greater impairment in CFR on DTG/ABC/3TC may derive more benefit from switching to BIC/FTC/TAF
  - Lower CD4 count and elevated high sensitivity troponin may identify PWH who have low CFR
  - Further research needed to explore this subpopulation

ADDITIONAL KEY INFORMATION

Key Abbreviations:
DTG/ABC/3TC = dolutegravir/abacavir/lamivudine; BIC/FTC/TAF = bictegravir/tenofovir alafenamide/emtricitabine; CFR = coronary flow reserve; MBF = Myocardial blood flow; ASCVD = atherosclerotic cardiovascular disease; SD = standard deviation; ARV = antiretroviral

Disclosures: Funding for this study provided by Gilead Sciences, Inc.

Author Contact Information: Daniel Huck, Brigham and Women's Hospital,
Email: dhuck@bwh.Harvard.edu