Effect of Treatment for Opioid Use Disorder on Endothelial Function in People with and without HIV

845

Jared C. Durieux[1], Ann Avery[2], **Corrilynn O. Hileman**[2]

[1]University Hospitals Cleveland Medical Center, Cleveland, Ohio, USA, [2]The MetroHealth System, Case Western Reserve University School of Medicine, Cleveland, Ohio, USA

BACKGROUND

- Cardiovascular disease (CVD) risk is higher in people with HIV (PWH) than the general population.
- We have previously shown that illicit opioid use is associated with heightened microbial translocation, systemic inflammation, and immune activation[1], as well as, aortic inflammation which was greatest in PWH[2].
- Treatment with buprenorphine (BUP) or methadone (MTD) is an effective harm reduction strategy for people with opioid use disorder (OUD).
- Medications that bind opioid receptors including BUP and MTD have immunomodulatory potential which could alter downstream CVD risk.
- Whether there is a benefit of BUP vs. MTD on CVD risk is not known and especially important in PWH.

METHODS

- 48-week, prospective, cohort study to evaluate changes in endothelial function and arterial elasticity in people with and without HIV initiating treatment for OUD.

Inclusion	Exclusion
✓ Age ≥18 years ✓ Currently injecting or snorting heroin for ≥1 month with cumulative use ≥12 months by self report ✓ Initiating BUP or MTD (or on ≤7 days) ✓ With or without HIV If PWH on ART: ✓ On stable ART x 3 months ✓ HIV-1 RNA ≤400 cps/ml For this analysis: ✓ Completed EndoPAT at entry and at 1 follow-up visit over 48 weeks	✓ Autoimmune disease ✓ Cancer ✓ Infection ✓ Pregnancy ✓ Diabetes mellitus ✓ CVD ✓ AST/ALT >2.5 x ULN ✓ Hemoglobin <9 g/dl ✓ CrCl <30 ml/min by Cockcroft-Gault

- Fasting reactive hyperemic index (RHI) and augmentation index standardized at 75 beats per minute (AI75) were measured by fingertip arterial tonometry using EndoPAT (ZOLL Itamar), and pulse wave velocity (PWV) measured by carotid-to-femoral applanation tonometry using Complior Analyse (Alam Medical) were determined in all participants at Entry, Weeks 12 (EndoPAT only), 24 and 48.

Statistical Methods

- Constrained longitudinal mixed models with random intercept and slope assessed changes in outcomes adjusted for age, sex, race, and time on BUP/MTD.

Endothelial function (reactive hyperemia index) was better in participants with opioid use disorder treated with buprenorphine than methadone, while arterial stiffness was similar over 48 weeks.

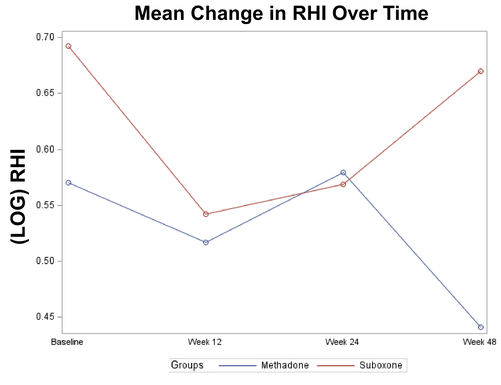
RESULTS

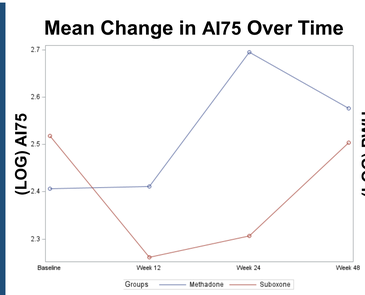
Baseline	Overall (N=82)	BUP (n=54)	MTD (n=28)
Age, years	39 (33, 52)	39 (33, 47)	43 (34, 55)
Female at birth	27 (33)	18 (33)	9 (32)
White	67 (82)	46 (85)	21 (75)
Black	12 (15)	6 (11)	6 (21)
Other	3 (4)	2 (4)	1 (4)
Hispanic ethnicity	17 (21)	14 (26)	3 (11)
BMI, kg/m^2	23 (22, 27)	23 (22, 27)	23 (21, 29)
Current smoker	79 (96)	52 (96)	27 (96)
HTN	8 (15)	4 (13)	4 (16)
Total cholesterol, mg/dl	166 (139, 186)	165 (133, 184)	170 (155, 188)
HDL, mg/dl	46 (37, 54)	45 (35, 51)	48 (38, 54)
LDL, mg/dl	98 (70, 115)	94 (69, 112)	102 (72, 119)
IV heroin	65 (79)	41 (76)	24 (86)
Intranasal heroin	17 (21)	13 (24)	4 (14)
Active Hepatitis C	43 (53)	30 (57)	13 (46)
HIV+	21 (26)	20 (37)	1 (4)
Current CD4+, cells/mm^3	651 (409, 846)	-	-
Nadir CD4+, cells/mm^3	271 (99, 558)	-	-
HIV-1 RNA ≤400 cps/ml	16 (89)	-	-
HIV duration, years	12 (5, 18)	-	-

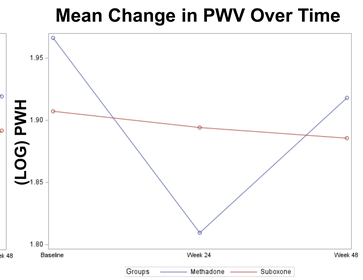
Median (IQR) for continuous variables and frequency (column percent) for categorical variables shown. Only overall values provided for HIV-related variables due to small number in MTD group.

Baseline	BUP (n=54)	MTD (n=28)	P
RHI	2 (1.5, 2.6)	1.8 (1.4, 2.3)	0.11
RHI ≤1.67	15 (29)	11 (41)	0.31
AI75, %	6.5 (-6, 20)	8.5 (-4.5, 21.5)	0.99
PWV, m/s	6.8 (6, 7.6)	6.9 (6.3, 8.4)	0.45

Median (IQR) for continuous variables and frequency (column percent) for categorical variables shown. RHI ≤1.67 is abnormal.







RESULTS

- Over 48 weeks, the proportion of participants with RHI <=1.67 increased 4.3% among MTD treated and 5.4% among BUP treated.
- At 48 weeks, the adjusted marginal mean difference in RHI decreased from 1.8 to 1.6 [Δ -0.2 (95% CI: -0.2, 0.6)] among MTD treated and nominally increased from 2.09 to 2.1 [Δ 0.01 (95% CI: -0.3, 0.3)] among BUP treated [adjusted mean difference at 48 weeks MTD vs BUP -0.48 (95% CI: -0.88, -0.08; P=0.03)].
- There were no differences in change in AI75 or PWV over 48 weeks between groups.

LIMITATIONS

- Limited power to assess small differences or interactions.
- Some participants did switch from MTD to BUP and vice versa during the study.

CONCLUSIONS

- Measures of arterial stiffness did not differ by medication used for OUD (BUP vs MTD).
- Endothelial function as measured by RHI was better in participants treated with BUP than MTD over 48 weeks.
- There are many considerations when developing a treatment plan in people with OUD. Medication for OUD containing BUP may be a better choice for PWH than MTD given heightened CVD risk in this population.

REFERENCES

1. Hileman CO, et al. JAIDS. 2022. PMID 35001040.
2. Hileman CO, et al. CID. 2023. PMID 36208157.

This work was supported by NIDA [grant number R01DA044576 to C.O.H. and G.A.M.] and the CTSC of Cleveland [grant number UL1TR002548].