Progression of Aortic Valve Calcification and Association With Lipoprotein(a) in Aging Thai People Living With HIV

658

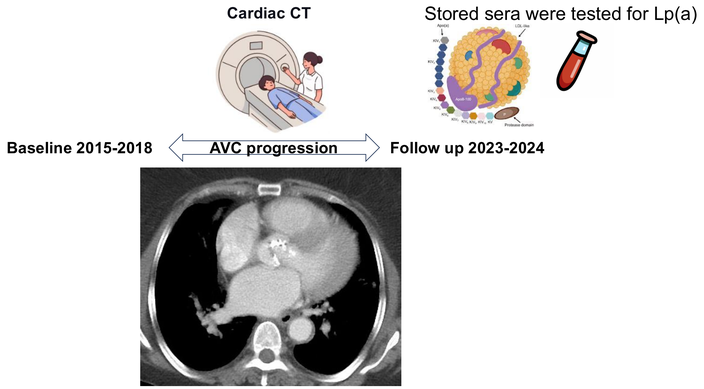
Napon Hiranburana, MD, MSc[1,2], Pairoj Chattranukulchai, MD, MSc[3], Sarawut Siwamogsatham, MD, MSc[3], Tanakorn Apornpong, MSc[1], Stephen J. Kerr, PhD[1,4,5], Sasiwimol Ubolyam, PhD[1,2], Yanisa Jarusyingdumrong, MD[1], Napisa Bunnag, MD[6], Monravee Tumkosit , MD[6], Weerapan Khovidhunkit, MD, PhD[7], Anchalee Avihingsanon, MD, PhD[1,2]

1 HIV-NAT, Thai Red Cross AIDS and Infectious Diseases Research Centre, Bangkok, Thailand, 2 Center of Excellence in Tuberculosis, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand, 3 Division of Cardiovascular Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand., 4 Research Affairs, Faculty of Medicine, Chulalongkorn University, Bangkok Thailand, 5 The Kirby Institute, University of New South Wales, Sydney, Australia, 6 Department of Radiology, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand., 7 Division of Endocrinology and Metabolism, Department of Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand

BACKGROUND

- Aortic valve calcification (AVC), which shares a similar pathophysiology with atherosclerosis, has been linked to increased cardiovascular mortality.
- This study aimed **to evaluate AVC progression in PLWH and its association with lipoprotein(a) [Lp(a)]**, a genetically determined risk factor for atherosclerosis, together with traditional cardiovascular risk factors in aging PLWH receiving long-term suppressive antiretroviral therapy (ART).

METHODS



- Thai PLWH aged **≥50 years from HIV-NAT in** Bangkok,
- Individuals with **structural heart disease, rheumatic heart disease, or bicuspid aortic valves were excluded by echocardiogram.**

Baseline assessments:

- 10-year ASCVD risk, smoking and alcohol status, metabolic profiles, statin use
- HIV virologic control, CD4 count, ART regimen and duration
- Inflammatory markers (IL-6, hs-CRP)
- Carotid intima-media thickness (cIMT)

- AVC progression: defined as a square-root difference in Agatston score >2.5.
- Logistic regression assessed the association of elevated Lp(a) (>50 mg/dL) and other determinants with AVC progression.

In aging Thai PLWH on long-term suppressive ART, Lp(a) >50 mg/dL and ART duration >15 years independently predicted AVC progression beyond traditional risk factors.

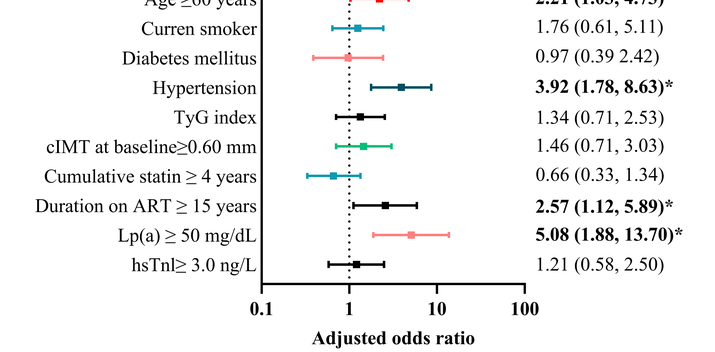
RESULTS

- Among **275 participants**, 61 **(22%) showed AVC progression over a median follow-up of 5.9 years** (IQR 5.5-6.8).
- Of 231 with baseline AVC = 0, 29 **(12.5%) developed new AVC**
- Sixteen major adverse cardiovascular events (MACE) occurred during follow-up.

Table 1: Baseline characteristic by AVC progression status

Variables	Total	Stable AVC	AVC progression	P-value
	N=275	N=214	N=61	
Sex, n (%)				0.138
Male	165 (60.0%)	123 (57.5%)	42 (68.9%)	
Female	110 (40.0%)	91 (42.5%)	19 (31.1%)	
Age (years), median (IQR)	54.4 (51.9-59.5)	54.2 (51.7-58.1)	57.1 (52.6-63.7)	0.002
BMI (kg/m^2), median (IQR)	23.2 (20.9-25.2)	23.3 (21.0-25.2)	22.8 (20.9-25.1)	0.403
10-year ASCVD risk score (%), median (IQR)	6.2 (3.0-11.3)	5.3 (2.6-9.7)	10.8 (4.8-18.5)	<0.001
Smoke status, n (%)				0.554
Never smoke	187 (68.0%)	147 (68.7%)	40 (65.6%)	
Ex-smoker	54 (19.6%)	43 (20.1%)	11 (18.0%)	
Current smoking	34 (12.4%)	24 (11.2%)	10 (16.4%)	
Alcohol use				0.361
Never	222 (80.7%)	170 (79.4%)	52 (85.2%)	
Use	53 (19.3%)	44 (20.6%)	9 (14.8%)	
Diabetes mellitus, n (%)	44 (16.0%)	27 (12.6%)	17 (27.9%)	0.009
Hypertension, n (%)	107 (38.9%)	67 (31.3%)	40 (65.6%)	<0.001
Dyslipidemia, n (%)	248 (90.2%)	195 (91.1%)	53 (86.9%)	0.333
HCV co-infection, n (%)	23 (8.4%)	20 (9.3%)	3 (4.9%)	0.430
LDL-C (mg/dL), median (IQR)	124.6 (99.8-148.8)	124.6 (99.2-149.0)	123.7 (102.0-146.5)	>0.99
Triglyceride (mg/dL), median (IQR)	153.0 (103.0-217.0)	151.5 (102.0-204.0)	181.0 (108.0-240.0)	0.074
Triglyceride-glucose index*, median (IQR)	8.9 (8.5-9.3)	8.8 (8.5-9.2)	9.1 (8.6-9.4)	0.029
Lp(a) (mg/dL), median (IQR)	14.7 (6.0-29.6)	14.4 (5.7-27.6)	17.3 (7.2-46.2)	0.157
Lp(a) ≥30 mg/dL, n (%)	68 (24.7%)	47 (22.0%)	21 (34.4%)	0.063
Lp(a) ≥50 mg/dL, n (%)	32 (11.6%)	19 (8.9%)	13 (21.3%)	0.012
eGFR by CKD-EPI (ml/min/1.73m^2), median (IQR)	92.5 (78.0-102.0)	93.4 (80.1-102.3)	87.7 (74.0-101.2)	0.145
CD4-T cell count (cell/mm^3), median (IQR)	620 e(490-797)	613 (485-794)	648 (517-817)	0.375
Nadir CD4, median (IQR)	179 (91-259)	176 (87-245)	186 (97-282)	0.505
Duration year on ARV (years), median (IQR)	16.2 (12.6-19.2)	16.1 (11.9-18.8)	17.1 (15.2-19.5)	0.011
ART at baseline				
NNRTI, n (%)	166 (60.4%)	132 (61.7%)	34 (55.7%)	0.459
INSTI, n (%)	11 (4.0%)	6 (2.8%)	5 (8.2%)	0.070
PIs, n (%)	111 (40.4%)	84 (39.3%)	27 (44.3%)	0.554
Inflammatory markers				
hs-CRP (mg/L), median (IQR)	1.1 (0.6-2.7)	1.2 (0.6-2.8)	1.0 (0.6-2.2)	0.442
IL-6 (pg/mL), median (IQR)	5.8 (4.0-7.8)	5.8 (4.0-8.0)	5.7 (4.1-7.0)	0.415
cIMT (mm), median (IQR), (n=258)**	0.63 (0.54-0.72)	0.61 (0.54-0.71)	0.69 (0.59-0.79)	0.002
Cumulative statin exposure (year), median (IQR)	5.4 (2.5-7.4)	5.4 (2.5-7.3)	5.1 (3.2-9.1)	0.684
hsTnI, ng/L, median (IQR),(n=258)**	3.1 (1.8-4.7)	2.9 (1.8-4.5)	3.5 (2.2-6.0)	0.042

Figure: Predictors of AVC progression in Aging PWH



Forest plot illustrating odds ratios from a multivariable logistic regression for associations with AVC progression.
Significant associations were observed for Lp(a) ≥50 mg/dL, hypertension, Age > 60 years and ART duration ≥15 years.
BMI = body mass index; cIMT, carotid intima-media thickness; hsTnI = High-sensitivity troponin I; Lp(a) = lipoprotein(a); PWH, people with HIV; TyG = Triglyceride-glucose

CONCLUSIONS

- **In aging PLWH on long-term suppressive ART, elevated Lp(a) was an independent predictor of AVC progression alongside traditional risk factors.**
- **Future studies should evaluate whether Lp(a)-lowering therapies can mitigate AVC and atherosclerotic disease in PLWH.**

Author Contact Information: napon.hir@gmail.com