718

Conference on Retroviruses and Opportunistic Infections (CROI)
March 4–7, 2018
Boston, Massachusetts, USA

Coronary artery calcification in virologically suppressed aging HIV-infected Thais

Pairoj Chattranukulchai [1], Monravee Tumkosit [2], Sarawut Siwamogsatham[3], Tanakorn Aponpong[4], Sivaporn Gatechumpol[4], Akarin Hiransuthikul[4], Stephen Kerr[4], Opass Putcharoen[5], Boonyaratavej S[1], Kiat Ruxrungtham [4,6], Praphan Phanuphak[4], Anchalee Avihingsanon[4,6]

[1] Division of Cardiovascular Medicine, Department of Medicine, Faculty of Medicine, Chulalongkorn University; [2] Department of Radiology, Faculty of Medicine, Chulalongkorn University; [3] Division of Ambulatory and Hospital Medicine, Department of Medicine, Faculty of Medicine, Chulalongkorn University;

[4]The HIV Netherlands Australia Thailand Research Collaboration (HIV-NAT), Thai Red Cross AIDS Research Centre, Bangkok, Thailand ; [5]Division of Infectious Diseases, Department of Medicine, Faculty of Medicine, Chulalongkorn University; [6] Department of Medicine, Faculty of Medicine, Chulalongkorn University

Contact: **Anchalee Avihingsanon, MD, PhD**
HIV-NAT, Thai Red Cross AIDS Research Centre,
104 Ratchadamri Rd., Pathumwan,
Bangkok, Thailand 10330
Tel: 662 652 3040; Fax: 662 252 5779
Email: anchalee.a@hivnat.org
www.hivnat.org; www.trcarc.org

INTRODUCTION

- PLHIV are at a 1.5 to 2-fold greater risk for cardiovascular disease (CVDs) than the general population [1].
- Given the high morbidity and mortality related to CVD, early interventions to reduce CVD risk are crucial.
- With the campaign to "end AIDS in 2030" and scale up of life saving ART in many countries, the ageing HIV population has increased, and CVD is expected to rise.
- There is thus a need to understand the burden and risk of subclinical atherosclerosis in this population, to enable the National HIV program to develop appropriate strategies to prevent CVD risk among HIV-infected individuals.
- Coronary artery calcification (CAC) is a surrogate marker of atherosclerosis, and is significantly related to future major cardiovascular events (MACE) and mortality [2-4].

OBJECTIVE

To determine the prevalence and predictive risk of subclinical atherosclerosis by CAC among HIV-infected adults from Thailand

METHODS

- HIV infected subjects aged >50 years who received HIV care in a prospective long term cohort at HIV-NAT, Thailand were enrolled. Subjects with evidence of MACE were excluded.
- CAC was measured by cardiac multidetector row computed tomography (MDCT). All MDCT scans were read by 1 radiologist who was blinded from patient care.
- Subclinical atherosclerosis was defined as CAC greater than zero (CAC>0).
- Liver fibrosis was assessed by transient elastography (fibroscan).

RESULTS

- Demographic data, HIV parameters and ART information are presented in table 1. Totally 324 subjects (61.7% male, median age of 54 years, 13.9% /21.3% current/former smokers) were enrolled. The median duration of ART was 16 years and 31% were on boosted PI.
- The median overall CAC was 32.8 (IQR 6.5-118) and **47.5% had CAC>0**, and 33% had CAC score >10
- The distribution of overall CAC score, among males, females and among different fibrosis staging were presented in Figure 1 A, 1B, and 1C, respectively.
- In the multivariate regression analysis (Table2), older age (aOR1.07, 95%CI 1.02-1.13, p=0.01), male gender (aOR 2.58, 95%CI 1.47-4.52, p=0.001), hypertension (aOR 1.82, 95%CI 1.05-3.14, p=0.03), and fibroscan increase per 1 unit (KPa) (aOR 1.14 (95% CI 1.04-1.25), p=0.006) were highly associated with the CAC score >0.
- Smoking, body weight, BMI, waist-hip ratio, diabetes mellitus, hepatitis B and C and HIV related factors such as CD4, ART duration, ARV regimen were not correlated with CAC score >0.

CONCLUSION

- Despite low prevalence of current/former smokers, subclinical atherosclerosis among well suppressed HIV-infected Aging Thais was relatively high (47.5%).
- Apart from traditional CVD risk (age, hypertension, male sex), liver fibrosis was significantly associated with subclinical atherosclerosis. Strategy to prevent future MACE such as statin, is warranted.

ACKNOWLEDGEMENTS

The authors would like to thank the HIV-infected patients who participated in the study.
This study was funded by the Higher Education Research Promotion and National Research University Project of Thailand, Office of the Higher Education Commission, Health Cluster year2016, Project Code NRU59-014-HR.

REFERENCES

1. Freiberg MS JAMA Intern Med 2013;173(8):614-622; 2. Kazuhiro O Glob Heart 2016 11(3): 287-293; 3. Polonsky TS JAMA 2010 303(16) 1610-6; 4. Detrano R NEJM 2008:358(13):1336-45

Table 1. Demographic characteristic by calcium score groups

Characteristics	Total N=324	Calcium score ≤0 N=170	Calcium score >0 N=154	p-value
Age, years	54 (52 -59)	54 (51-57)	55 (53-60)	0.001
Male, N(%)	200 (61.7)	83 (48.8)	117 (76.0)	<0.001
Smoking, N(%)				0.12
Never smoker	210 (64.81)	119 (70)	91 (59.09)	
Former-smokers	69 (21.3)	30 (17.65)	39 (25.32)	
Current smokers	45 (13.89)	21 (12.35)	24 (15.58)	
ASCVD risk score	6.0 (3.0-11.6)	4.3 (2.1-8.7)	9.0 (4.7-16.4)	<0.001
ASCVD risk score>7.5%, N(%)	134 (41.4)	48 (28.2)	86 (55.8)	<0.001
Diabetes mellitus, N(%)	55 (17.0)	15 (8.8)	40 (26.0)	<0.001
Hypertension, N (%)	129 (39.8)	48 (28.2)	81 (52.6)	<0.001
Current systolic pressure, mmHg	128 (118-137)	126 (116-135)	130 (123-138)	<0.001
SBP > 130mmHg, N(%)	136 (42.0)	60 (35.3)	76 (49.4)	0.01
Current diastolic pressure, mmHg	78 (72-85)	78 (71-84)	78 (73-87)	0.09
DBP > 85 mmHg, N(%)	76 (23.5)	33 (19.4)	43 (27.9)	0.07
BMI, kg/m^2	23.2 (20.8-25.3)	23.3 (20.8-24.8)	23.0 (20.8-26.0)	0.69
Hepatitis B infection, N(%)	43 (13.3)	19 (11.2)	24 (15.6)	0.24
Hepatitis C infection, N(%)	30/324 (9.3)	14/170 (8.2)	16/154 (10.4)	0.50
Total cholesterol ,mg/dL	203 (181-237)	204 (178-235)	203 (181-239)	0.97
Triglycerides, mg/dL	160 (103-220)	152 (102-218)	165 (107-221)	0.39
LDL,mg/dL	123 (101-148)	125 (102-147)	123 (99-149)	0.81
HDL,mg/dL	46 (39-57)	48 (40-57)	44 (36-55)	0.11
Fasting glucose, mg/dl	92 (85-102)	89 (83-97)	95 (89-107)	<0.001
Fasting plasma glucose ≥100 mg/dl, N(%)	92 (28.4)	32 (18.8)	60 (39.0)	<0.001
Hs-CRP, mg/dl	1.25 (0.59-2.74)	1.23 (0.55-2.7)	1.28 (0.62-2.78)	0.83
>3 mg/dl , N(%)	71 (21.91)	37 (21.76)	34 (22.08)	0.95
Metabolic syndrome, n (%)	136 (42.0)	67 (39.4)	69 (44.8)	0.33
Serum creatinine, mg/dL	0.87 (0.76-1.05)	0.84 (0.75-1.01)	0.90 (0.77-1.09)	0.07
eGFR by CKD EPI, ml/min/1.73m^2	88.35 (73.78-98.33)	88.05 (74.61-97.9)	88.6 (72.8-98.37)	0.90
ALT,U/L	28 (21-39)	28 (21-39)	28 (22-38)	0.61
FIB-4	1.05 (0.84-1.41)	0.98 (0.83-1.27)	1.15 (0.86-1.54)	0.003
≥ 1.45	77 (23.77)	29 (17.06)	48 (31.17)	0.003
Fibroscan Stiffness, KPa	5.4 (4.4-7.2)	5.0 (4.4-6.5)	5.9 (4.4-8.1)	0.01
Fibroscan >7.2 KPa, n (%)	69 (24.47)	28 (18.79)	41 (30.83)	0.02
Duration of ART, years	16 (13-19)	16 (12-19)	16 (14-19)	0.33
Current ART regimen				0.04
NNRTI, N(%)	181 (55.86)	103 (60.59)	78 (50.65)	
PI, N(%)	100 (30.86)	53 (31.18)	47 (30.52)	
Both NNRTI and PI, N(%)	27 (8.33)	9 (5.29)	18 (11.69)	
Abacavir exposure, N(%)	34 (10.5)	20 (11.8)	14 (9.1)	0.43
Current CD4 ,cells/mm^3	621 (487-800)	650 (497-821)	607 (477-758)	0.09
<200 cells/mm^3, N(%)	6 (1.9)	3 (1.8)	3 (1.9)	0.90
Nadir CD4, cell/mm^3	177 (80- 259)	191 (87-258)	167 (74-259)	0.56
<200 cells/mm^3	184 (57.0)	94 (55.6)	90 (58.4)	0.60
Current HIV RNA < 50 copies/mL, N(%)	316 (97.5)	165 (97.1)	151 (98.1)	0.57
Lipodytrophy/lipoatrophy	191 (60.1)	92 (55.4)	99 (65.1)	0.08

Median (interquartile range) is applied. otherwise specify
ART: antiretroviral therapy; PI: Protease inhibitor; NNRTI: Non nucleoside reverse transcriptase, eGFR: estimated glomerular filtration rate; CKD-EPI: Chronic Kidney Disease Epidemiology Collaboration; ALT: alanine aminotransferase; BMI: body mass index; LDL: low density lipoprotein cholesterol; HDL: high density lipoprotein cholesterol
sBP: systolic Blood Pressure; dBP: diastolic Blood Pressure

Table 2. Multivariate regression analysis for factors correlated with abnormal Calcium score >0

	Univariate			Multivariate		
	OR crude	95%CI	P	OR adjust	95%CI	P
Age, year	1.08	(1.03-1.13)	0.002	1.07	(1.02-1.13)	0.01
Gender						
Male	3.31	(2.06-5.34)	<0.001	2.58	(1.47-4.52)	0.001
Female	Ref			Ref		
Hypertension						
No	Ref			Ref		
Yes	2.82	(1.78-4.47)	<0.001	1.82	(1.05-3.14)	0.03
Diabetes mellitus						
No	Ref			Ref		
Yes	3.63	(1.91-6.88)	<0.001	1.64	(0.79-3.40)	0.19
Fibroscan, KPa	1.14	(1.05-1.23)	0.003	1.14	(1.04-1.25)	0.006
Lipodytrophy						
No	Ref			Ref		
Yes	1.50	(0.96-2.36)	0.08	1.41	(0.82-2.40)	0.21

Figure 1A: Overall distribution of coronary calcification

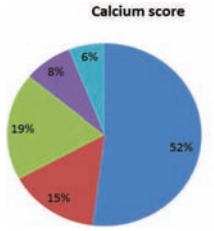


Figure 1B: Distribution of coronary calcification among male and female

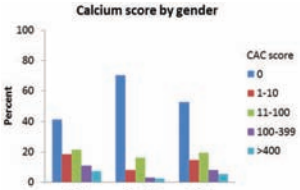


Figure 1C. Distribution of coronary calcification among liver fibrosis stage

