

SHORT COMMUNICATION

ART and comorbidities

sc 10 Atherogenic Index of Plasma as a Predictor of Cardiovascular Events in People living with HIV: Evidence from the ICONA Cohort

Authors

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ABSTRACT

Background: The Atherogenic Index of Plasma (AIP) is a recognized predictor of coronary artery disease (CAD) in both the general population and people living with HIV (PWH) in Africa. This study aimed to investigate the association between AIP and cardiovascular (CV) events in the ICONA cohort.

Methods: AIP was calculated as log10((triglycerides /88.57)/(HDL/38.67) for mg/dl. Five consecutive nested case-control studies have been adopted. Each Case-control includes all patients in ICONA with CV (CASES) who reported AIP value 1 to 5 year before the CV event and 5 concurrent control without CV individually matched for age,-sex and time (i.e. in FUP in the same year of the case). Association between CV events (binary) and AIP, HDL and triglycerides (all as continuous variables) by conditional logistic regression model. In order to evaluate the role of AIP, and HDL and triglycerides alone to predict CV events over time mixed effect regression model with random intercept on case-clusters were used. All models were adjusted for the same set of potential selected confounders.

Results: Overall 168 cases (CA) and 840 controls (CO) have been included: 154 CA and 770 CO, 138 CA and 690 CO, 126 CA and 630 CO and 105 CA and 525 CO were enrolled for Year 1, Year 2, Year 3, Year 4 and Year 5 before CVE, respectively (see Table 1 for Cohort's characteristics).

Mean AIP score remains higher for cases throughout the 5 five years, with higher values in the later years from the CV event (Figure 1). AIP was strongly associated with Cardiovascular event occurrence for each calendar year of observation with the following Odds Ratio (OR) at unadjusted analysis: 2,94 (Confidence interval [CI] 95% 1.7-5.0), 2.28 (CI 95% 1.3-4.0), 2.83 (CI 95% 1.6-5.0), 2.83 (CI 95% 1.6-5.0), 4.47 (CI 95% 2.4-8.5) and 2.28 (CI 95% 1.2-4.5) or Year 1, 2, 3,4 and 5, respectively.

Adjusting analysis for current Cd4, current Cd4/Cd8 ratio, nadir Cd4, years since HIV diagnosis, years on Antiretroviral Therapy (ART), Months on PI, Months on InSTI, Months on NNRTI, Months on Abacavir and current smoking status AIP remained strongly associated with CVE for Year 1, 2, 3 and 4 but not for Year 5 : OR 3.05 (CI 95% 1.6-5.8), 2.04 (CI 95% 1.0-4.0), 2.65 (CI 95% 1.3-5.3), 4.5 (CI 95% 2.1-9.9) and 1.77 (CI 95% 0.8-3.9), respectively.

Comparing the association with HDL alone, HDL showed an association for Year 2, 3 and 4 (OR 0.79 [Cl 95% 0.7-0.9]; OR 0.75 [Cl 95% 0.6-0.9] and OR 0.72 [Cl 95% 0.6-0.9]) but not with Year 1 and 5 (OR 0.88 [Cl 95% 0.8-1.0] and OR 0.75 [Cl 95% 0.7-1.0]. Triglycerides did not show any association with CV events.

Conclusions: Our findings provide strong evidence that AIP is a significant predictor of CV events in PWH in Italy, with its predictive strength increasing as the event approaches. The superior performance of AIP compared to HDL and triglycerides alone suggests that it may serve as a better risk stratification tool for cardiovascular prevention in this population.

Table 1 Cohort's Characteristics

	Year1			Year 2			Year 3			Year 4			Year5		
Patients' features	Control	cases	P-value												
Freq	840	168		770	770 154		690	138	1	630	126	1	525	105	
N. of smoker (%)	347 (44.5%)	94 (59.9%)	0,001	366 (52.4%)	56 (39.4%)	0,005	295 (46.7%)	79 (62.2%)	0,001	255 (44.1%)	69 (59.5%)	0,002	228 (46.7%)	63 (63.6%)	0,002
current CD4 count (SD)	642.31 (325.06)	636.99 (332.49)	0,849	615.91 (328.62)	640.60 (346.78)	0,406	619.53 (315.84)	615.41 (307.94)	0,89	630.16 (312.34)	606.94 (337.06)	0,455	639.62 (319.64)	627.12 (306.88)	0,715
current CD4/CD8 ratio (SD)	0.83 (0.57)	0.74 (0.48)	0,082	0.80 (0.70)	3.28 (29.20)	0,027	0.81 (0.52)	0.75 (0.47)	0,204	0.79 (0.49)	0.74(0.44)	0,278	0.80 (0.50)	0.73(0.42)	0,239
CD4 nadir (SD)	228.68 (174.57)	213.38 (181.07)	0,303	226.26 (179.24)	208.91 (181.58)	0,274	232.61 (173.52)	199.89 (181.18)	0,045	235.03 (171.66)	210.63 (181.78)	0,15	222.33 (165.70)	205.23 (178.66)	0,341
years since diagnosis (SD)	10.12 (7.96)	10.60 (8.27)	0,48	10.11 (7.90)	10.81 (8.65)	0,323	9.16 (7.31)	10.03 (8.72)	0,219	8.67 (7.19)	9.70 (8.33)	0,154	9.51 (7.80)	9.90 (7.81)	0,64
Time to ART (SD) *	42.21 (64.93)	40.88 (60.64)	0,807	47.34 (68.46)	45.28 (62.38)	0,73	37.34 (57.59)	43.11 (62.77)	0,29	36.50 (56.17)	40.19 (59.21)	0,506	43.80 (65.12)	39.02 (57.65)	0,485
Exposure to PI (SD) *	36.67 (51.30)	47.36 (54.52)	0,015	33.76 (46.52)	43.14 (55.38)	0,027	35.23 (52.23)	40.17 (51.38)	0,31	33.13 (44.86)	40.35 (52.49)	0,11	35.30 (47.04)	45.32 (51.23)	0,05
Exposure to INSTI (SD) *	12.73 (24.41)	14.91 (26.53)	0,298	9.86 (21.13)	11.26 (21.88)	0,457	7.49 (18.80)	9.60 (18.82)	0,229	6.41 (17.99)	5.74 (12.85)	0,689	5.82 (16.91)	5.13 (11.84)	0,692
Esposure to NNRTI (SD) *	36.64 (55.34)	24.28 (40.72)	0,006	34.71 (53.10)	27.38 (48.07)	0,113	35.48 (55.62)	24.68 (45.55)	0,032	32.47 (49.39)	25.31 (43.89)	0,131	32.50 (50.79)	25.01 (41.77)	0,156
Exposure to ABC (SD) *	12.60 (31.36)	14.55 (29.13)	0,457	12.02 (30.10)	13.52 (31.61)	0,574	12.22 (31.80)	12.68 (29.11)	0,877	10.38 (26.28)	11.51 (26.75)	0,663	10.80 (28.88)	9.65 (20.17)	0,696
LDL (SD) #	117.45 (37.10)	126.36 (42.69)	0,009	116.84 (40.73)	125.24 (43.75)	0,031	115.90 (37.43)	126.29 (43.01)	0,007	120.77 (36.61)	127.73 (43.69)	0,074	124.97 (39.18)	124.11 (45.14)	0,85
HDL (SD) #	47.99 (15.37)	44.82 (15.95)	0,016	46.87 (14.49)	43.66 (12.39)	0,01	47.67 (15.28)	42.83 (12.24)	<0.001	48.25 (14.35)	42.87 (10.99)	< 0.001	47.63 (15.62)	43.26 (11.77)	0,007
Triglycerides (SD) #	167.91 (311.23)	215.08 (259.95)	0,066	168.81 (140.03)	207.03 (250.57)	0,008	172.74 (335.61)	211.64 (262.16)	0,199	160.40 (107.82)	190.47 (107.73)	0,004	176.75 (152.62)	183.28 (100.80)	0,675
AIP (SD)	0.09 (0.32)	0.19 (0.37)	< 0.001	0.12 (0.31)	0.19(0.31)	0,006	0.10 (0.32)	0.21(0.33)	<0.001	0.09 (0.30)	0.23(0.31)	<0.001	0.15 (0.33)	0.23 (0.30)	0,022

*in months , # mg/dl

Legend to the table: SD: Standard Deviation; ART: AntiRetroviral Therapy; PI: Protease Inhibitors; INSTI: INtegrase Strand Transfer Inhibitors; NNRTI: Non-Nucleoside Reverse Transcriptase Inhibitors; ABC, Abacavir; LDL: Low density Lipoprotein Cholesterol; HDL: High density Lipoprotein Cholesterol; AIP: Atherogenic Index of Plasma.



Legend to the figure1 : AIP: Atherogenic Index of Plasma, CV: cardiovascular

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