Aging well with HIV infection: beyond the absence of comorbidities

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What is Cognitive Ageing?

Cognitive abilities include awareness, information handling, memory and reasoning.

Cognitive Aging is a major determinant of Frailty and Multimorbidity

While the existing literature is largely focused on a "deficit approach," understanding the characteristics of older individuals with HIV who are "aging successfully" may help to inform preventative efforts.

Successful Cognitive Aging (SCA)

SCA broadly refers to the multidetermined process of preserving cognitive abilities, or exhibiting less- than-expected decline in neural structure and function typically associated with aging and its comorbidities

SCA is operationalized as the absence of neurocognitive and self-reported symptoms including depression in elderly

Purpose

✓ to describe prevalence and predictors of Successful Cognitive Aging (SCA), in elderly HIV infected pts.

✓ to find relationships between HIV-Associated Non AIDS (HANA) conditions and both SCA and non-SCA condition (Depressed or Cognitive Impaired).

METHODS

SCA was diagnosed excluding Neurocognitive & Psychiatric symptoms evaluated with:

➢ Performance based neurocognitive deficits including:
1. Hopkins Verbal Learning Test
2. Non-dominant Grooved Pegboard,
3. Trail Making Test (Parts A&B)

➢ Self-reported symptoms including:
1. Evaluation of personal performance in the daily activities
2. Instrumental Activities of Daily Living questionnaire (IADL)

3. Depression (Centre for Epidemiologic Studies Depression Scale - CESD≥16)

"SCA"

"D"
Depression with no cognitive impairment

"CI"
cognitive impairment with or without depression

No SCA
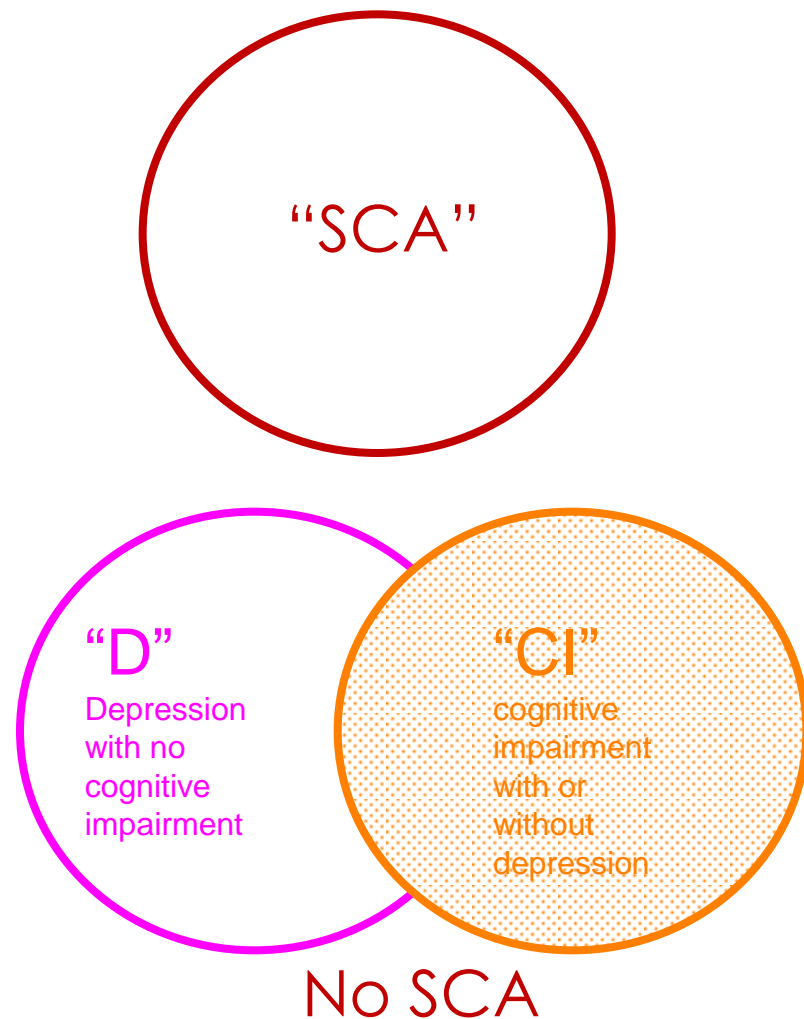
METHODS

Inclusion criteria were:
o age≥50 years
o on HAART for at least 1 year,
o suppressed HIV-RNA viral load (<40copies/ml)

Exclusion criteria were:
o acute psychotic disorders
o severe neurological disease
o end-stage organ failure.

➤ Frailty was assessed using the deficit accumulation conceptualization (Rockwood, Lancet 1999) and expressed in a frailty index (cut off>2.8).

"SCA"
41(38.7%)

"D"
24
(22.6%)

"CI"
41(38.7%)

No SCA
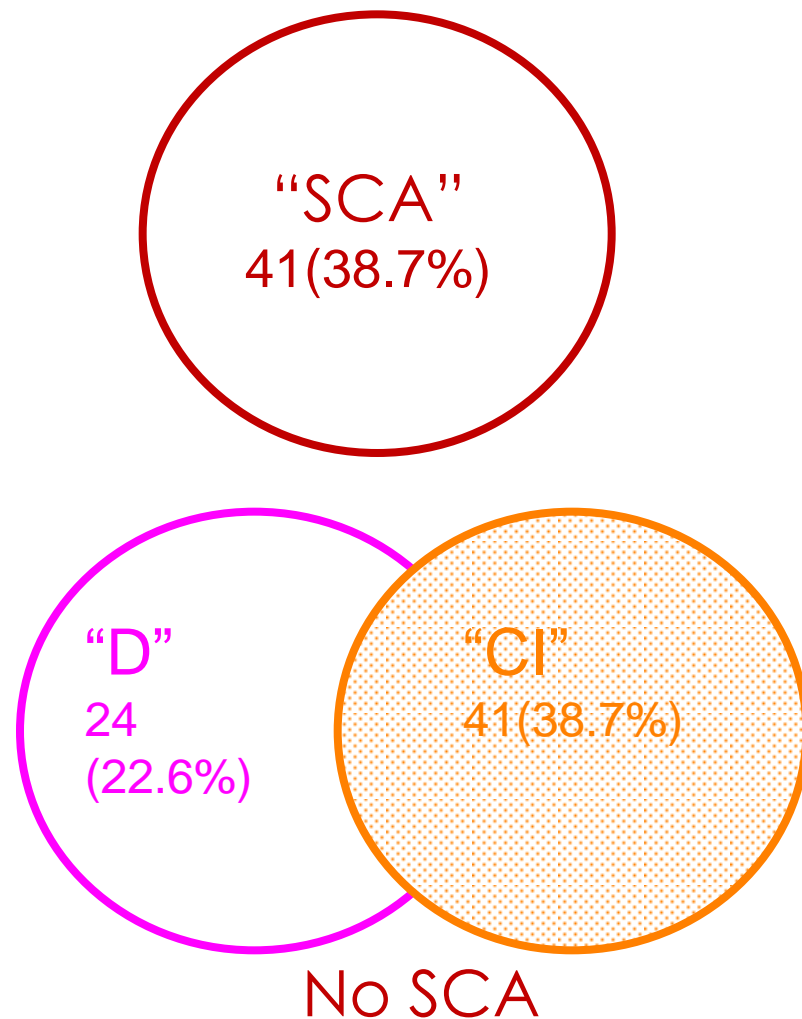
Demographic variables of the population

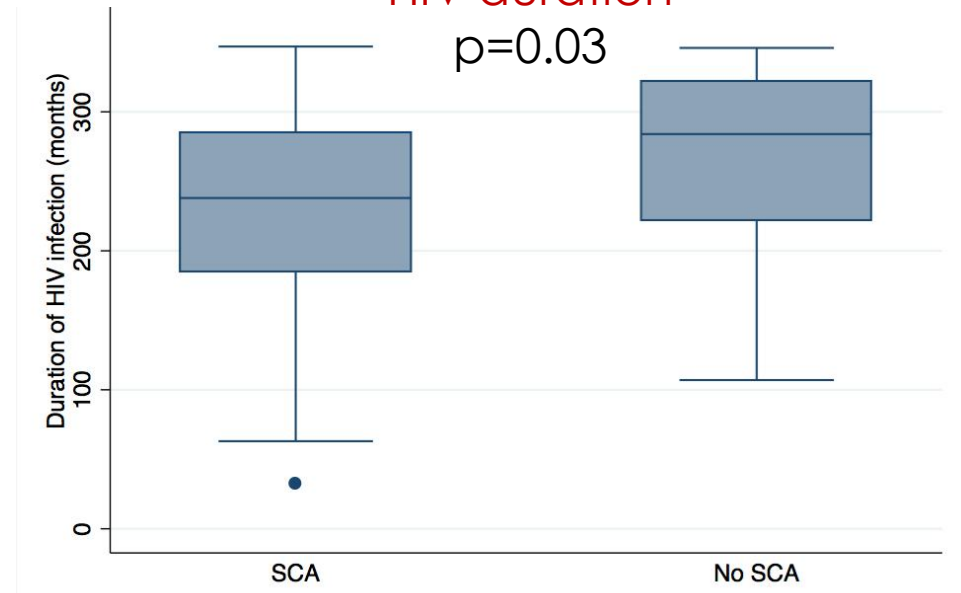| CHARACTERISTICS n(%), m(IQR)	SCA GROUP 41 (38.68%)	D GROUP 24 (22.64%)	CI GROUP 41 (38.68%)	P-VALUE
DEMOGRAPHIC CHARACTERISTICS				
Age	54 (52-62)	55 (52-59.5)	54 (52-58)	
Male sex	28 (68.29%)	17 (70.83%)	33 (80.49%)	
Smoke pack year	22.2 (12.7-32)	25.5 (8.5-25.5)	21 (10.4-32.7)	
Physiscal activity				0.046
No gym	15 (36.6%)	16 (66.67%)*	23 (56.10%)	
<3/week	22 (53.7%)	8 (33.3%)	10 (39.%)	
>3/week	4 (9.8%)	0 (0%)	2 (4.88%)	
Daily alcool intake				
No alcool	19 (46.3%)	14 (58.3%)	28 (68.29%)	
<20 g/day	20 (48.8%)	10 (41.67%)	13 (31.71%)	
>=20 g/day	2 (4.88%)	0 (0%)	0 (0%)	
BMI	24.8 (22.1-26.4)	24.9 (21.5-27.8)	24.2 (21.1-26.3)	

HIV-specific variables of the population

| CHARACTERISTICS n(%), m(IQR)	SCA GROUP 41 (38.68%)	D GROUP 24 (22.64%)	CI GROUP 41 (38.68%)	P-VALUE
CDC group C	11 (28%)	7 (29%)	13 (34%)	
HIV Risk Factor				
IDU	9 (21.9%)	1 (4.17%)	12 (29.27%)	
MSM	11 (26.83%)	12 (50%)	13 (31.71%)	
Hetero	17 (41.46%)	8 (33.33%)	14 (34.15%)	
HIV infection duration (months)	257 (210-2297)	230.5 (175-274)*	284 (222-322)	0.034
HCV infection	13 (31.7%)	3 (12.5%)	15 (36.59%)	
Lympho CD4+ nadir	170 (100-245)	200 (87.5-303)	160 (57-216)	
Lympho CD4+ count	606 (493-715)	669 (447-742)	564 (432-687)	
ARV duration (months)	166 (121-208)	123 (96-197)	183 (126-200)	
Prevoius NNRTI (months)	56 (12-128)	77 (0.5-107.5)	25 (0-100)	
Prevoius PI (months)	91 (58-142)	75 (7.5-108)	100 (52-149)	

CD4/CD8
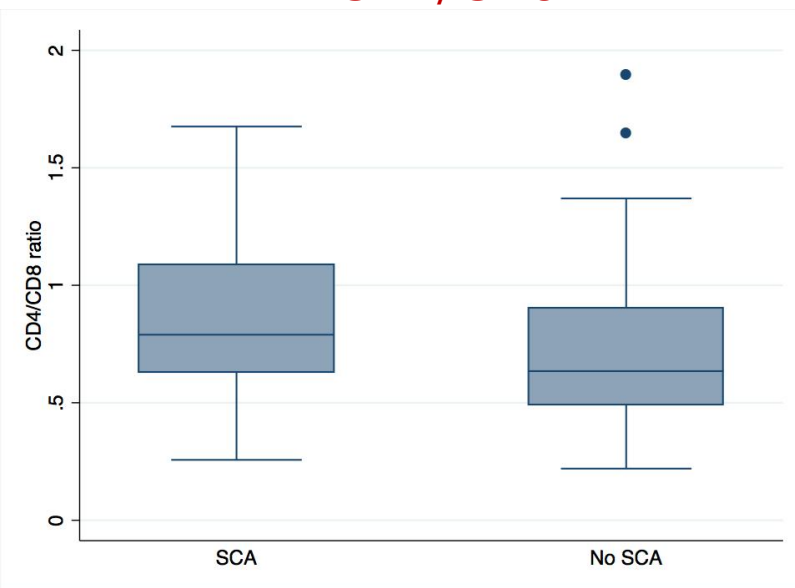
HIV duration
p=0.03

Metabolic variables of the population

| CHARACTERISTICS n(%), m(IQR)	SCA GROUP 41 (38.68%)	D GROUP 24 (22.64%)	CI GROUP 41 (38.68%)	P-VALUE
Glucose	94 (88-103)	96 (90-113)	98 (89-106)	
Triglycerides	145 (87-191)	147 (93-211)	137 (79-281)	
Total cholesterol	186 (166-203)	199 (190-232)*	191 (152-211)*	0.0356
HDL cholesterol	56 (42-64)	55 (44-65)	43 (35-63)	
LDL cholesterol	117 (95-127)	135 (111-166)*	104 (91-136)*	0.0051
ApoA1 lipoprotein	162 (149-173)	169 (135-182)	138 (130-165)*	0.0444
ApoB lipoprotein	88 (78-102)	108 (91-123)*	92 (76-114)*	0.0088
HOMA index	2 (1.42-2.92)	1.7 (2.49-3.64)	2.135 (1.49-4.1)	
PTH	38.15 (30-44)	39 (28.4-50)	32.2 (22.8-41.6)	
TSH	1.83 (1.19-2.96)	1.67 (1.1-2.31)	2.2 (1.59-3.42)	
Vitamin D	32.7 (25.9-38.5)	31.1 (22.4-37.1)	33.9 (26.3-38.9)	
MDRD	84.2 (66.9-98.4)	84 (78.8-92.9)	87.6 (79.5-108.8)	

Apo A1
p=0.04
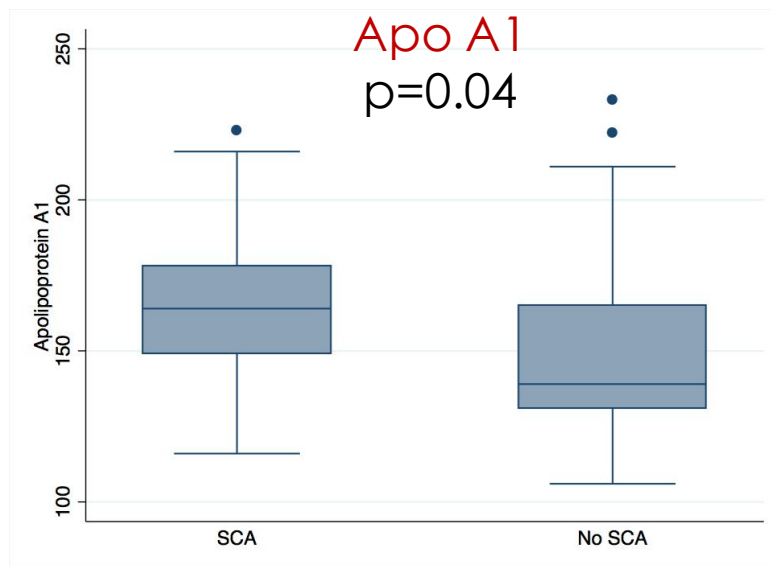
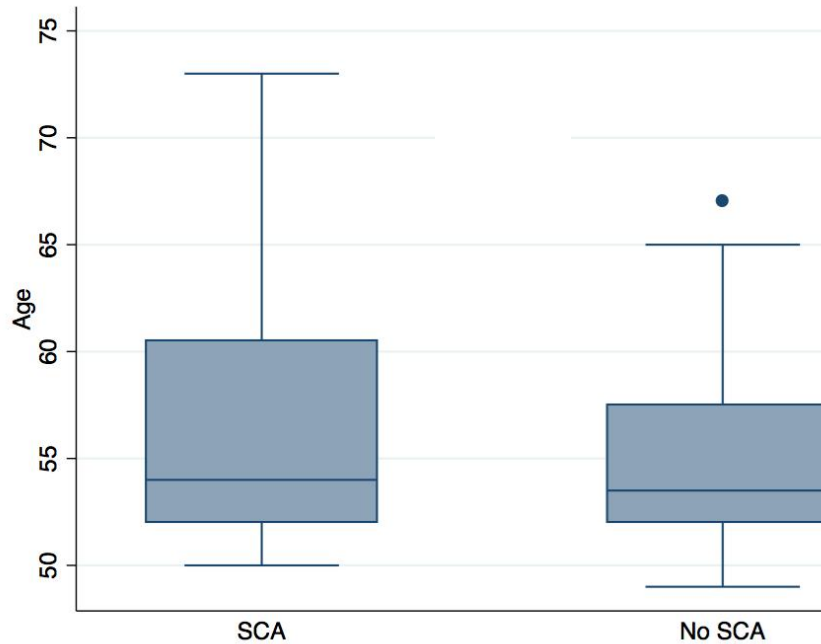# Cardiovascular variables of the population
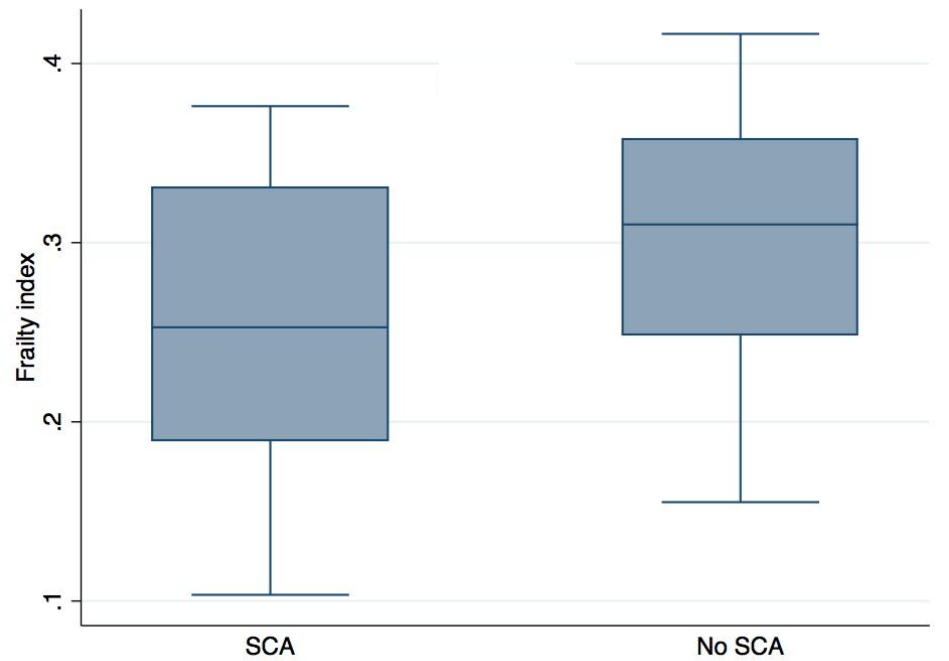
VAT/TAT
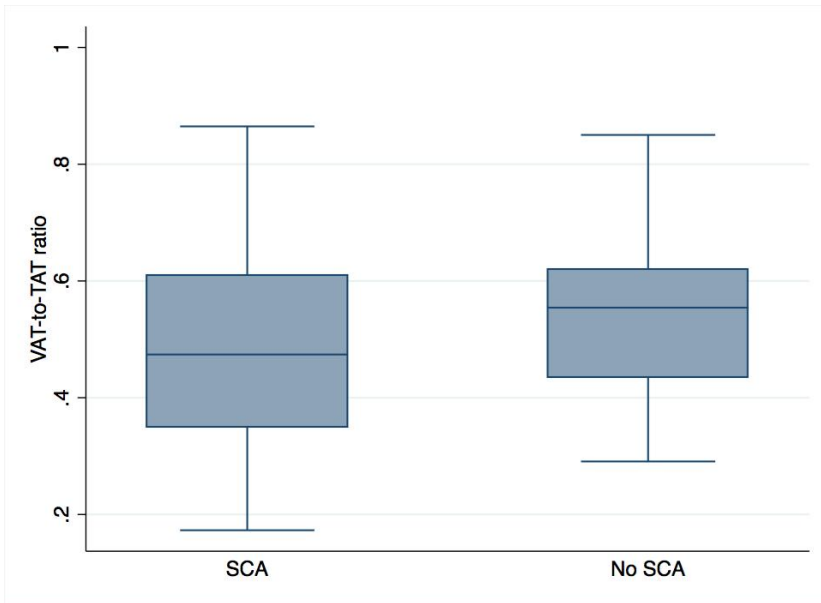
CAC>0
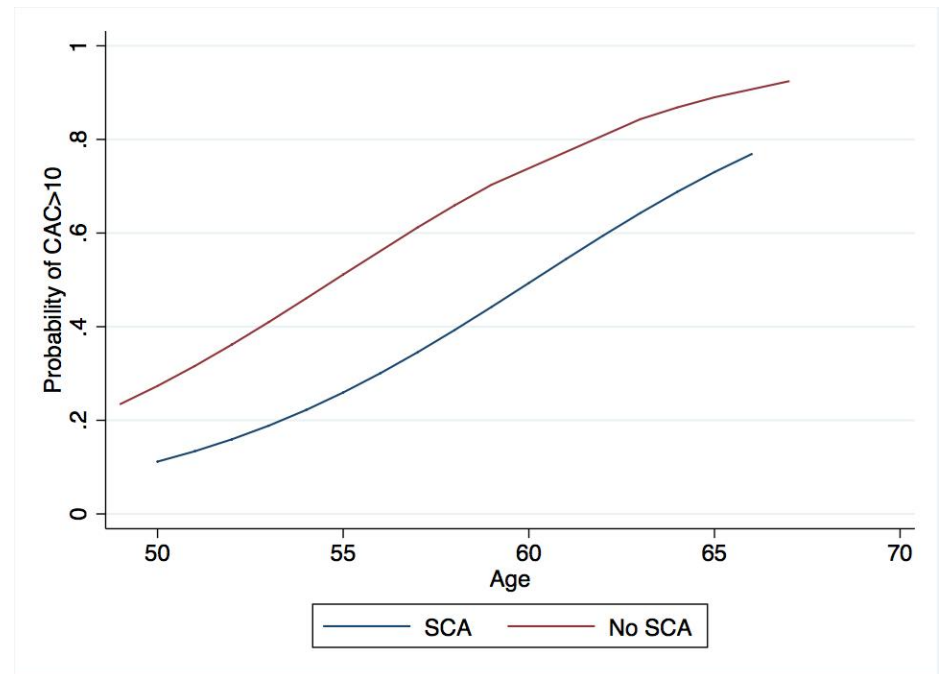
Age vs frialty

Age

Frailty index
p=0.012

Multivariable logistics regression analyses for factor associated with SCA group

	estimate	Std err	p
Age	0,95	0,04	0,30
Education	1,29	0,62	0,58
HIV duration	1,00	0,003	0,01
FRS>6	1,95	1,25	0,29
ApoB/ApoA	3,66	2,63	0,07
CAC>10	3,24	1,87	0,04

Distribution of patients according to classification in SCA group, CI group and D group.
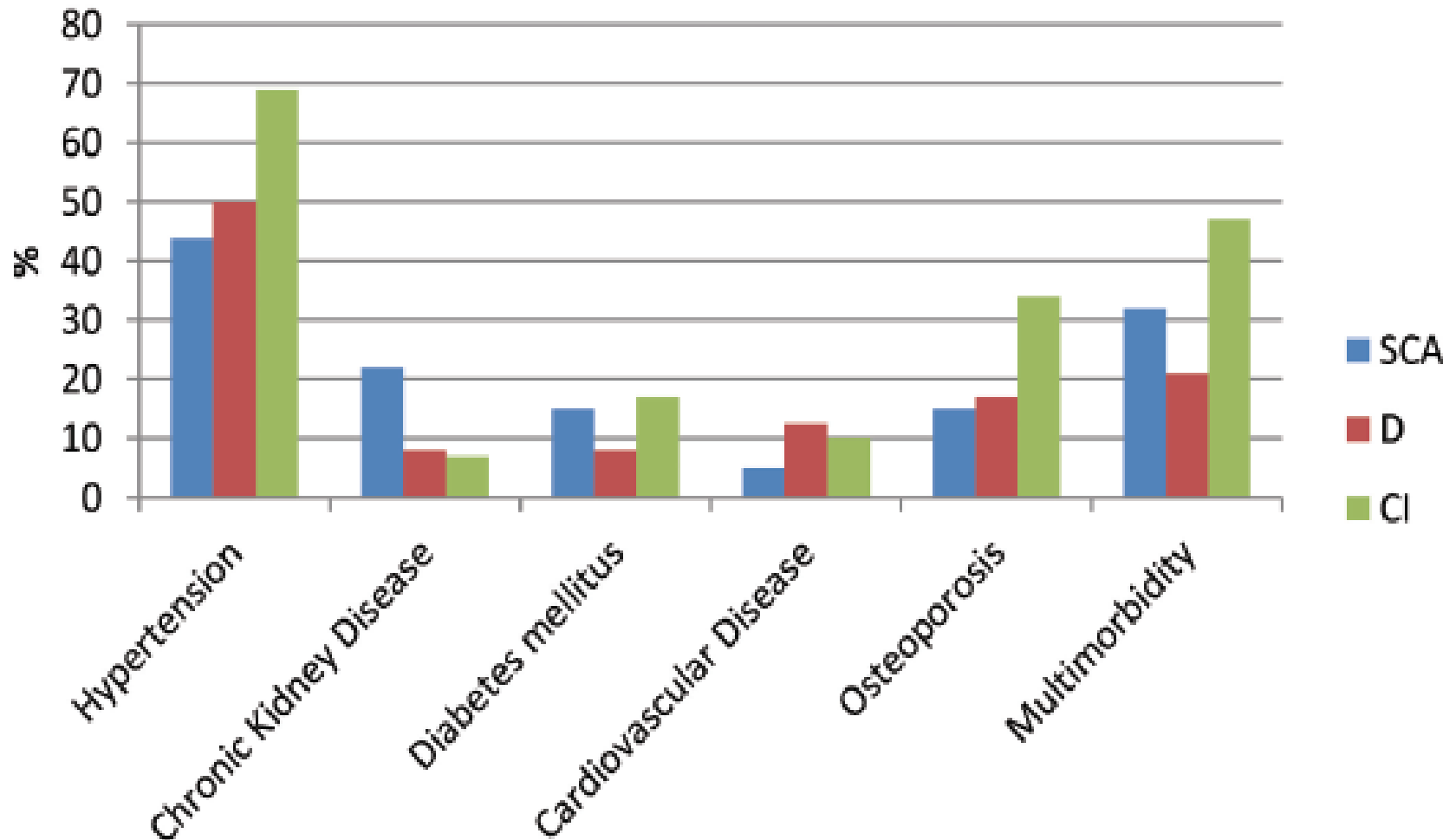
Univariate and Multivariable logistics regression analyses for factor associated with SCA group.

| Factor	UNIVARIATE ANALISYS			MULTIVARIABLE ANALISYS		
	OR	95% C.I.	p-value	OR	95% C.I.	p-value
Cardiovascular disease	0.42	0.083-2.15	0.301			
Hypertension	0.52	0.23-1.15	1.107			
Osteoporosis	0.44	0.16-1.23	0.123	0.38	0.12-1.17	0.093
Diabetes Mellitus	0.53	0.98-2.86	0.461			
Hypogonadism	1.16	0.48-1.79	0.726			
Multimorbidity	0.66	0.28-1.57	0.359			
HOMA	0.94	0.78-1.12	0.498			
Vit D	1.00	0.96-1.03	0.953			
PTH	1.01	0.98-1.03	0.371			
TSH	0.88	0.63-1.23	0.479			

Discussion

A minority (38.7%) only of HIV patients over 50 yrs experience Successful Cognitive Aging. The burden of Depression is significant in this population (38%). Treatment of this comorbidity is most likely to be effective in increasing the proportion of individuals with SCA.

Although these pts display favourable cardio-metabolic profile and less osteoporosis, cognitive and physical conditions (HANA and MM) are not independent predictors of SCA, suggesting that other patient related outcomes including social, psychological and spiritual status may be a component of SCA that should be evaluated.

Our study provides evidence for a definition of successful cognitive aging that is broader than one based on absence of disease supporting the multidimensional model of successful aging theory, which emphasizes an integration of positive attitudes toward self and aging and attainment and maintenance of life goals and social interconnectedness.

Future steps

Facilitating the development of effective interventions aimed at promoting well-being and optimizing clinical outcomes (eg, treat depression, increase social engagement) in the rapidly growing population of aging HIV+ adults will be productive areas for future research.
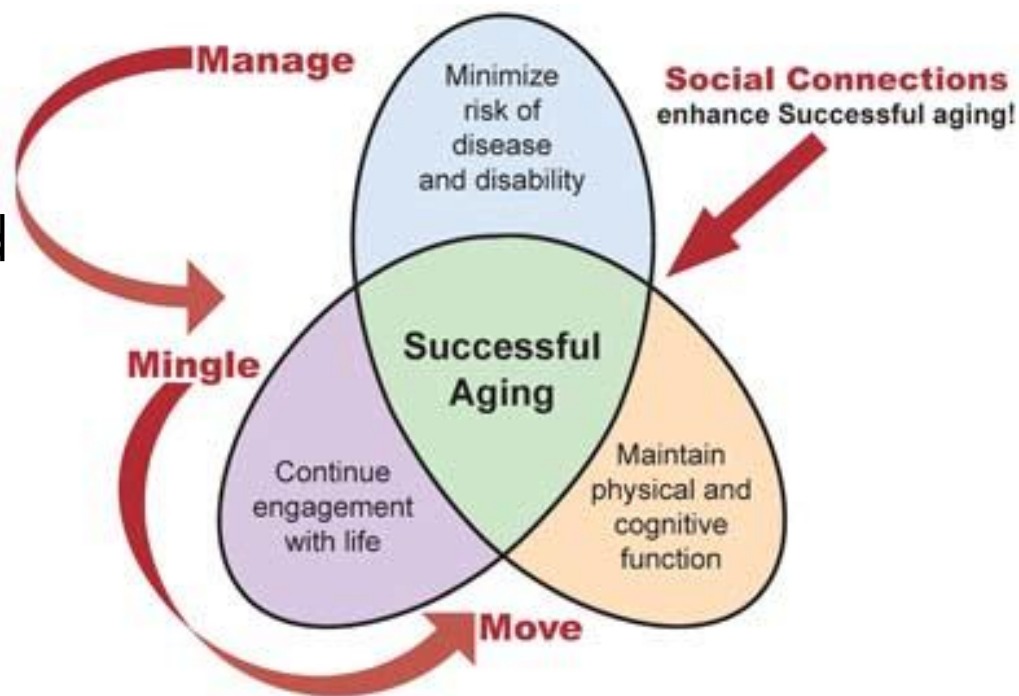
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