Fat distribution and density in PLWH with ≥5% weight gain

Guaraldi G[1], Draisci S[2], Milic J[1,3], Carli F[1], Besutti G[3], Bassoli C[4], Raimondi A[1], Ciusa G[1], Ligabue G[2], Mussini C[1], Erlandson K[5], Brown TT[6], Lake JE[7]

[1]Modena HIV Metabolic Clinic, University of Modena and Reggio Emilia, Italy; Radiology Unit, University of Modena and Reggio Emilia, Italy; [3]Clinical and Experimental Medicine PhD Program, University of Modena and Reggio Emilia, Italy; [4]University of Modena and Reggio Emilia, Italy, [5]University of Colorado, Department of Medicine, Aurora, CO; [6]Division of Endocrinology, Diabetes, and Metabolism, Department of Medicine, Johns Hopkins University, Baltimore, Maryland; [7]University of Texas Health Sciences Centre, Houston, Texas

Objective

The objective was to assess ectopic fat **quantity** and **density** in virally suppressed ART-experienced people with HIV (PLWH) who had **weight gain** (WG) after switching to INSTI-based ART **(INSTI-s)** vs remaining INSTI-naive **(INSTI-n)** on stable ART.

Methods

- This was an observational cohort study from 2007 to 2019 at Modena HIV Metabolic Clinic.
- PLWH were grouped as INSTI-s vs INSTI-n.
- Body composition (BC) was assessed at 1st visit and at last evaluation.
- In the INSTI-s group, the 1st visit was prior to switch.

Outcome was significant WG was defined as an increase of ≥5% weight from 1st visit over follow-up.

Fat quantity was assessed with:

- DXA:
  - weight
  - total lean mass
  - total fat mass
- CT:
  - Visceral adipose tissue area (VAT)
  - Subcutaneous adipose tissue area (SAT)
  - Epicardial adipose tissue area (EAT)
  - Liver-to-spleen density ratio (L/S)

Fat quality was assessed with CT:

- VAT-d
- SAT-d
- EAT-d
- psoas muscle density (P-d).

Results

Clinical characteristics	INSTI-n (N=207)	INSTI-s (N=211)	p
Age, years, mean (SD)	49.9 (8.5)	50.1 (7.4)	0.45
Sex, males, n (%)	146 (70.5%)	150 (71.1%)	0.99
BMI, kg/m², mean (SD)	23.5 (3.5)	23.6 (3.4)	0.58
Waist circumference, cm, mean (SD)	86.9 (10.1)	86.9 (9.7)	0.88
Nadir CD4, cell/ml, median (IQR)	210 (105-300)	150 (54-245.3)	<0.001
HIV duration, months, median (IQR)	191.5 (129.8-262.8)	228.5 (159.5-280.3)	0.001
CD4/CD8 ratio, mean (SD)	0.89 (0.43)	0.74 (0.41)	0.001
Current CD4, cell/ml, median (IQR)	623 (483.5-830.3)	559 (400.5-740)	0.002

Fat quantity at baseline

Baseline characteristics	INSTI-n (N=207)	INSTI-s (N=211)	p
Subcutaneous adipose tissue (SAT), cm³, mean (SD)	144.5 (96.4)	143.5 (79.9)	0.64
Visceral adipose tissue (VAT), cm³, mean (SD)	134.4 (78.6)	136.9 (77.5)	0.68
Epicardial adipose tissue (EAT), cm³, mean (SD)	129 (49)	129.4 (46.5)	0.92
Liver to spleen ratio (L/S), mean (SD)	1.2 (0.2)	1.2 (0.2)	0.53

Fat quality at baseline

Baseline characteristics	INSTI-n (N=207)	INSTI-s (N=211)	p
Epicardial adipose tissue density (EAT), HU, mean (SD)	-81.4 (6.2)	-81.2 (5.3)	0.75
Psoas density (PD), HU, mean (SD)	51.3 (8.2)	52.1 (5.0)	0.15
Subcutaneous adipose tissue (EAT-D)density, HU, mean (SD)	-96.2 (8.7)	-96 (15.7)	0.50
Visceral adipose tissue density (VAT-D), HU, mean (SD)	-90 (16.4)	-90.3 (9)	0.28

Fat quantity

At last observation in the subset of weight gainers

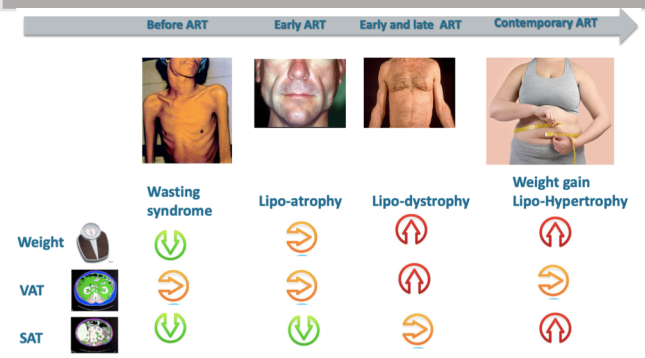
PLWH with WG only at follow-up	INSTI-n n=51	INSTI-s n=57	p	INSTI-n DELTA change n=51	INSTI-s DELTA change n=57	p
Follow-up, years, mean (± SD)	4 (±1.1)	4.5 (±2.5)	0.35	4 (±1.1)	4.5 (±2.5)	0.35
BMI, kg/m2, mean (± SD)	25 (±4.2)	25.4 (±3.9)	0.5	1.9 (±0.32)	2.47 (±0.3)	0.006
Obesity, (%)	11.8%	14%	0.95	+1.45%	+2.52%	0.22
Total lean, kg, mean (± SD)	48 (±9.8)	47.2 (±9)	0.89	-0.6 (±0.7)	0.5 (±1.1)	0.37
Total fat, kg, mean (± SD)	20.1 (±8.6)	19.5 (±6.4)	0.9	5.5 (±0.9)	6.2 (±1.7)	0.3
VAT, cm² mean (± SD)	165.7 (±81.2)	166.1 (±77.4)	0.82	36 (±15.8)	51.1 (±14.4)	0.18
SAT, cm² mean (± SD)	194.9 (±112.4)	205.8 (±106.8)	0.5	45.5 (±13.8)	61.3 (±12.6)	0.06
EAT, cm² mean (± SD)	133.6 (±49)	132.5 (±62.2)	0.5	9.8 (±9.6)	12.7 (±6.14)	0.16
Liver to spleen ratio, mean (± SD)	1.2 (±0.2)	1.2 (±0.2)	0.9	-0.04 (±0.06)	-0.15 (±0.06)	0.62

Fat quality

At last observation in the subset of weight gainers

PLWH with WG only at follow-up	INSTI-n n=51	INSTI-s n=57	p	INSTI-n DELTA change n=51	INSTI-s DELTA change n=57	p
Follow-up, years, mean (± SD)	4 (±1.1)	4.5 (±2.5)	0.35	4 (±1.1)	4.5 (±2.5)	0.35
VAT-d, HU, mean (± SD)	-89.8 (±28)	-94 (±6.9)	0.8	-2 (±2)	-5.8 (±1.9)	<0.001
SAT-d, HU, mean (± SD)	-100.4 (±4.9)	-97.6 (±27.8)	0.56	-3.7 (±2.3)	-4.15 (±2.1)	0.22
EAT-d HU, mean (± SD)	-81.9 (±4.9)	-81.9 (±5.4)	0.48	-1.1 (±2.4)	-3.4 (±1.8)	0.96
Psoas-d, HU, mean (± SD)	53.8 (±5.7)	53.9 (±5.7)	0.77	1.4 (±1.6)	3.6 (±1.9)	0.64

Discussion and conclusions



- Over a four-year interval, PLWH with ≥5% WG INSTI-s had a greater gain in BMI compared to those who remained INSTI-naïve, mainly driven by SAT, but there were no differences in the changes in ectopic fat depots.
- The differences in VAT density associated with INSTI-s does not suggests a metabolic abnormal fat gain, but we may hypothesize an improvement in fat tissue quality.

Corresponding author: giovanni.guaraldi@unimore.it

HIV Drug Therapy GLASGOW 2020

UNIMORE UNIVERSITÀ DEGLI STUDI DI MODENA E REGGIO EMILIA