

Nutrition support service focused on weight loss in an HIV outpatient clinic: our experience

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Introduction/Summary

- In our HIV Outpatient Clinic 497 out of 1131 patients (43.9%) have a BMI (Body Mass Index) >25 and 128 out of 1131 (11.31%) have a BMI ≥30.
- Considering that 55.2% of our patients are overweight or obese, we assumed that a nutritional support service could be an effective intervention to reduce this high percentage and therefore improve the quality of life of our HIV population.
- This pilot project aims to help the patients lose weight while attending their usual HIV Clinic.

Study Design

- Patients with BMI >25 were selected according to their motivation to follow a hypocaloric diet.
- Body weight (Kg), height (cm), left arm, waist, abdomen, hip and left thigh circumferences (cm) were measured at baseline (BL) and about every 1-2 months after beginning the diet.
- At BL patients underwent an abdomen ultrasound scan, a liver elastography (FibroScan) and a nutritional anamnesis to get, at the same BL Visit, a personalized Mediterranean hypocaloric diet.

Methods

- A Tanita BC-587 scale was used to measure weight, body fat (%), body water (%), muscle mass (Kg), visceral fat (index), bone mass (Kg) and basal metabolism (Kcal).
- Basal metabolism was also calculated by the Harris-Benedict algorithm.
- Total daily energy expenditure (TDEE) was calculated by the Metadieta software, the same software used for designing the diet plan.

Results

- 34 patients were evaluated at our Nutritional HIV Clinic between July 2022 and March 2024.
- Patients' characteristics at BL are described in Tables 1a and 1b.
- 31 out of 34 subjects were PLWH; 3 HIV seronegative patients were referred to the Nutritional Clinic, as they were affected by steatohepatitis.

Parameter	Value
Sex	F = 14 (41%); M = 20 (59%)
HIV infection	POS = 31 (91%); NEG = 3 (9%)
cART regimen	DRV+cobi+2NRTIs N = 4 (12%); INSTI+2NRTIs N = 15 (44%); DTG/3TC N = 5 (15%); DTG/RPV N = 5 (15%); DTG/DRV+cobi N = 2 (6%)
Time on cART	Mean 22 years <10 years = 5 (15%); 11-20 years = 5 (15%); >20 years = 21 (62%); NA = 3
Alcohol intake (yes/no)	YES = 15 (44%); NO = 19 (56%)
Steatosis grade (by ultrasound)	No steatosis = 10 (29%); Mild = 10 (29%); Moderate = 7 (21%); Moderate/severe = 1 (3%); Severe = 4 (3%); NA = 2
Liver stiffness (FibroScan)	Median 6.85 KPa F0 = 6; F1 = 7; F2 = 5; F3 = 3; F4 = 1; NA = 9
AST	>34 = 4 (12%); Normal limits = 30 (88%)
ALT	>59 = 5 (15%); Normal limits = 29 (85%)
GGT	>88 = 5 (15%); Normal limits = 27 (79%); NA = 2
Blood glucose	> 109 = 9 (27%); Normal limits = 24 (71%); NA = 1
Total cholesterol	>200 = 13 (38%); Normal limits = 16 (47%); NA = 5
LDL cholesterol	>130 = 21 (62%); Normal limits = 6 (18%); NA = 7
Triglycerides	> 150 = 11 (33%); Normal limits = 17 (50%); NA = 6
Blood CD4+ lymphocytes	200-500/mmc = 4 (12%); > 500/mmc = 26% (76%); NA = 4

Parameter	Value
Body height (cm)	Mean 166
Basal metabolism (Kcal)	Mean 1828
TDEE (Kcal)	Mean 2948
Physical exercise	Active = 4 (12%); moderate = 3 (9%); mainly inactive = 5 (15%); inactive = 17 (50%); NA = 2
Body weight (Kg)	Mean: F 83.7; M 101.2 <80 = 11 (32%); 80-90 = 6 (18%); 90-100 = 8 (24%); 100-120 = 4 (12%); >120 = 5 (15%)
BMI	Mean 34.5 < 25 = 1 (3%); 25.1-30 = 9 (27%); 30.1-35 = 11 (32%); >35.1 = 12 (35%)
Body fat (%)	Mean 37.5%
Body water (%)	Mean 45.7%
Muscle mass (Kg)	Mean 58.5
Visceral fat (Tanita Index)	Mean 14.2
Bone mass (Kg)	Mean 3.1
Basal metabolism by Tanita (Kcal)	Mean 1800
Left arm circumference (cm)	Mean 35.9
Waist circumference (cm)	Mean 111.5
Abdomen circumference (cm)	Mean 116.3
Hips circumference (cm)	Mean 113.2
Left thigh circumference (cm)	Mean 53.3

- 9 PLWH (26.4%) never started the prescribed diet and were lost to follow-up since the first visit (T1).
- 10 PLWH (29.4%) were completely lost at the second follow-up visit (T2).
- Body composition and anthropometric parameters at BL and their variations at T1 are represented in Table 2.

Parameter	BL	T1	Delta	P (Student's T)
Body weight (Kg)	88.5	86	-2.5	<0.0001
Body fat (%)	37.1 ± 7.7	36.5 ± 8.0	-0.6	ns (p=0.46)
Body water (%)	45.4	45	-0.4	ns (p=0.96)
Muscle mass (Kg)	53.6	51.5	-2.1	ns (p=0.09)
Visceral fat (Tanita Index)	15.3	14.5	-0.8	0.04
Bone mass (Kg)	2.8	2.7	-0.1	ns (p=0.17)
Left arm circumference (cm)	35.1	33.5	-1.6	0.045
Waist circumference (cm)	106.1	104.2	-1.9	0.0007
Abdomen circumference (cm)	112.6	107.8	-4.8	0.014
Hips circumference (cm)	109.5	108.2	-1.3	ns (p=0.3)
Left thigh circumference (cm)	52.5	52.1	-0.4	ns (p=0.5)
Basal metabolism by Tanita (Kcal)	1670	1629	-41	0.017

- Anthropometric parameters, measured over different timepoints (from BL to T3) are represented in Table 3.

Parameter	T0	T1	T2	T3	P (Student's T)
Body weight (Kg)	87.2	85.1	83	82.4	0.002
Left arm circumference (cm)	35.1	34	33.8	33.7	ns (p=0.1)
Waist circumference (cm)	108.8	107.3	105	104.6	0.009
Abdomen circumference (cm)	111.9	111.2	109	108.3	0.012
Hips circumference (cm)	110.4	108	106	106.6	0.006
Left thigh circumference (cm)	52.5	52.6	51.4	51.5	ns (p=0.3)

- Biochemical parameters did not significantly change at T1; change at T2 are described in Table 4.

Parameter	T0	T2	Delta	P (Student's T) T0 vs T2
AST (N=13)	22	19	-3	ns
GGT (N=12)	42	43	+1	ns
Blood glucose (N=11)	106	100	-6	ns
Total cholesterol (N=9)	236	185	-51	ns
LDL cholesterol (N=7)	124	93	-31	0.025
Triglycerides (N=10)	150	137	-13	ns
CD4+ lymphocytes (N=10)	890	900	+10	ns

Conclusions

- Although this pilot study is limited by the small number of patients on follow-up, we can conclude that a nutritional intervention can be effective in contributing to reduce the onset or the grade of metabolic syndrome. At T1 patients got, in fact, significant reductions of body weight, waist and abdominal circumferences, which were confirmed at T3.
- This favorable weight reduction was also associated with a significant reduction of LDL cholesterol and with a decreasing trend of blood glucose levels. Weight loss and its beneficial consequences on lipids and glucose level can also spare patients from statins or glucose-lowering drugs prescription, therefore limiting patients' pill burden and risk of drug-drug interactions.
- Unfortunately, 26.4% of our population was lost at the first follow-up. This observation confirms the suboptimal propensity of PLWH to undergo extra blood or instrumental tests, as we observed i.e. for oncological and cardiovascular screenings. However, we aim to extend the project to a wider range of patients and to improve the quality of the anthropometric measures using more precise instruments, like a bioimpedance analyzer.

Acronyms:
 NA: not available;
 F: female; M: male;
 cART: combined antiretroviral therapy;
 NRTIs: Nucleotide Reverse Transcriptase Inhibitors; INSTI: Integrase Strand Transfer Inhibitors;
 DRV+cobi: darunavir+cobicistat; DTG: dolutegravir; 3TC: lamivudine; RPV: rilpivirine;
 TDEE: Total Daily Energy Expenditure; BMI: Body Mass Index;
 AST: aspartate aminotransferase; ALT: alanine aminotransferase; GGT: gamma-glutamyl transferase