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"Endocrine NAFLD": a hormonocentric perspective of Non-Alcoholic Liver Disease (NAFLD) pathogenesis in HIV-infected patients

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Purpose of the study

We assessed endocrine system involvement in a multifactorial pathogenesis hypothesis of NAFLD in HIV-infected patients.

Methods

Cross-sectional observational study including all consecutive HIV-infected patients seen at a metabolic clinic who were screened for diabetes, thyroid dysfunction, male hypogonadism, female menopause, hypopituitarism. NAFLD was defined by liver-spleen attenuation values of ≤1.1 on computed tomography.

Summary of results

225 patients were included. (Table 1.)

We included endocrine variables (but not sex hormones) and known independent predicting variables (sex, waist circumference, ALT/AST, NRTI cumulative exposure) in a backward stepwise multivariate logistic regression analysis. Independent variables associated with NAFLD were NRTI cumulative exposure (OR = 1.11 per year; CI 1.01–1.20), ALT/AST (OR = 3.97; CI 1.78–8.87), waist circumference (OR = 1.06; CI 1.03–1.11). When including sex hormones in different gender groups insulin increased predictive value in female only (OR = 1.18; CI 1.03, 1.34).

Conclusion

Homeostasis of glucose appears the only endocrine system associated with NAFLD.

Table 1:

	NAFLD+	NAFLD-	P-value
Male, n (%)	71 (85.54)	92 (64.79)	< .001*
Age, yrs	48.43 ± 8.16	48.04 ± 8.84	.74**
CDC C, n (%)	41 (28.87)	21 (25.30)	.14*
ALT/AST	1.46 ± 0.52	1.12 ± 0.38	< .001 **
Waist, cm			
Total	90.26 ± 9.24	83.87 ± 9.27	< .001 **
Men	90.27 ± 8.41	85.13 ± 8.42	< .001 **
Women	90.18 ± 14.00	81.57 ± 10.35	.022 **
NRTI Cumulative Exp, months	124.16 ± 44.86	109.85 ± 49.16	.033 **
NNRTI Cumulative Exp, months	41.94 ± 30.43	35.54 ± 30.13	.15 **
PI Cumulative Exp, months	61.34 ± 36.87	60 ± 39.73	.81 **
Hormones			
TSH	1.93 ± 1.21	2.20 ± 1.57	.19 **
T4	11.01 ± 1.48	10.71 ± 1.38	.14 **
Insulin, median (IQR)	17.1 (11.65; 22.8)	10.2 (7.4; 16.5)	< .001§
LH, median (IQR) n = 60	4.6 (2.8; 9.5)	6.2 (4; 19.2)	.38§
FSH, (IQR) n = 60	4 (2.2; 8.9)	6.3 (4; 20.1)	.21§
17-beta-estradiol, (IQR) n = 60	81 (27; 104)	89 (38; 145)	.42§
Total testosterone, (IQR) n = 152	483 (372; 583)	433 (343; 531)	.11§
Free testosterone, (IQR) n = 152	13.2 (9.6; 16.8)	13 (8.8; 16.3)	.64§
GH, (IQR)	.11 (.06; .35)	.28 (.08; 1.04)	.003§
IGF1	132.32 ± 57.65	141.75 ± 61.33	.26 **
IGFBP3, (IQR)	3210 (2240; 4280)	3382 (2050; 4297)	.90§
Endocrine syndromes			
Hypothyroidism TSH ≥3.5, n (%)	7 (8.43)	18 (12.68)	.11*
Diabetes Fasting glucose ≥126 mg/dL	20 (24.10)	17 (11.97)	.018*
MenopauseLH and FSH > 20 ng/mL and 17 beta-estradiol < 40 pg/mL n = 62	2 (16.67)	7 (14)	.81*
Hypogonadism testosterone < 200 ng/dL n = 163	3 (3.26)	1 (1.41)	.29*
Hypopituitarism IGF-1 < 73 pg/mL and IGFBP3 < 1157 pg/mL	13 (15.66)	25 (17.61)	.70*

* chi-squared test; ** T-test; §Mann-Whitney test.