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DISTURBANCE IN IRON METABOLISM PARAMETERS, POSSIBLE MARKERS OF PRETERM AGING IN HIV-INFECTED MALE CAUCASIANS

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INTRODUCTION:

Aging is a biological process that does not progress at the same rate in every person. Genes, environment, and way of life may influence aging. The consequence of this multifactorial process is that chronological age does not necessarily match biological age.

The search for biomarkers of aging (BoA) has been largely explored. Good markers of aging must distinguish normal aging from pathological aging or aging related diseases. A combination of various biomarkers is a reliable approach to determine biological age or to recognize aging related diseases.

Number of studies have documented age-related iron accumulation in animal models. There are still no enough data in humans, especially in HIV-infected patients.

AIM:

The aim of this study was to estimate levels of iron metabolism parameters and their correlation with multimorbidity occurrence in HIV-infected aging patients.

MATERIALS AND METHODS:

Patients characteristics:

In this cross-sectional study we included 50 non-HIV infected blood donor volunteers and 50 HIV-infected patients on cART: 2NRTIs+NNRTI or 2NRTIs+PI. Both groups of patients were at age of 50 years and older, all males, all Caucasians. Inclusion criteria were 18 years and older and patients using cART for at least 12 months. Exclusion criteria were: co-infections with either HCV, HBV, TB, any acute diseases, radiotherapy or cytotoxic drug therapy, alcohol and/or narcotics usage.

In each group iron metabolism parameters: serum iron concentration, transferrin iron binding capacity (TIBC), transferrin saturation, serum transferrin and ferritin concentrations were determined. In both groups occurrence of multimorbidity was recorded. Multimorbidity was defined as the occurrence of two or more chronic conditions.

All patients gave informed consent and the study was approved by the Ethics Committee of the School of Medicine, University of Belgrade.

Statistical analysis:

Data are presented as count (%), mean ± standard deviation (SD) or median (25^{th}-75^{th} percentile), depending on data type. Comparisons of the two cohorts were made using a chi-square test or Fisher's exact test for categorical variables and using a Mann-Witney U test for continuous variables. . All data were analyzed using IBM SPSS Statistics version 20.0 (IBM, Armonk, NY, USA). All p-values less than 0.05 were considered significant.

TABLE 1. HIV PATIENTS BASELINE CHARACTERISTICS

VARIABLE	HIV-infected pts	Nº (%)
Gender	Males	50 (100%)
HIV transmision	1. MSM 2. Hetero 3. Unknown	42 (84 %) 4 (8 %) 4 (8 %)
Age (years)	Median (range)	59.6 ± 1.1
BMI (kg/m^2)	Mean ± SD	23.9 ± 3.44
cART (weeks)	Mean ± SD	43.71 ± 12.54
CD4+T cells (cells/mm^3)	Mean ± SD	567.0 ± 317.7
HIV RNA pVL (copies/mL)	pVL < 50	50 (100 %)

RESULTS:

HIV-infected patients characteristics were: mean age was 59.6 ± 1.1 years, median CD4+ T-cells count was 567.0 ± 317.7 cells/mm^3 . HIV RNA pVL was <50 copies/mL in all patients.

All iron metabolism parameters, except transferrin levels, were significantly different between HIV-infected and non-HIV infected group. Mean plasma levels of serum iron (81.83 ± 29.03 vs. 188.25 ± 119.99 mg/dL), TIBC (201.28 ± 82.51 µg/dL vs. 309.28 ± 136.02 µg/dL) and the percentage of transferrin saturation (41.97 ± 12.37 vs. 57.97 ± 14.14) were significantly lower (p<0.001) in HIV-infected vs. non-HIV group.

TABLE 2. IRON METABOLISM PARAMETERS

Variable	HIV infected pts	Non-HIV infected pts	*p* value
Serum iron (mg/dL)	81.8 ± 29.0	188.2 ± 119.9	p<0.001
Transferrin (µmol/L)	36.7 ± 16.0	44.6 ± 16.3	p<0.001
Transferrin iron binding capacity (TIBC), (µg/dL)	201.2 ± 82.5	309.2 ± 136.0	p<0.001
Transferrin saturation (%)	41.9 ± 12.3	57.9 ± 14.1	p<0.061
Ferritin (ng/mL)	123.7 ± 23.8	143.5 ± 48.2	p<0.001

FIGURE 1. SERUM IRON CONCENTRATION AND MULTIMOIRBIDITY

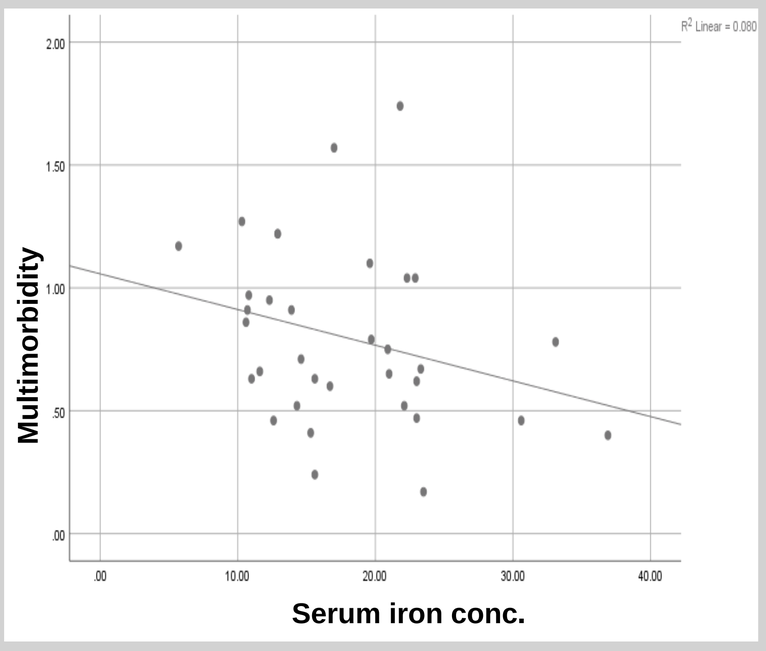
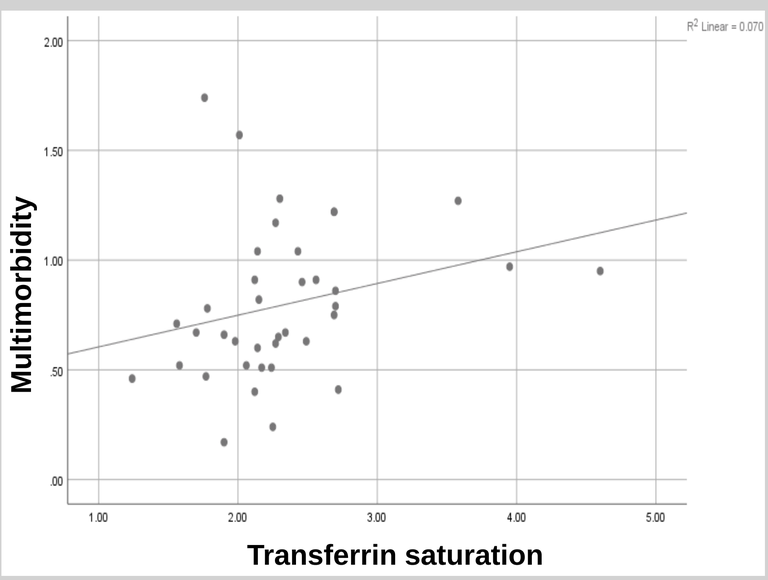


FIGURE 2. TRANSFERRIN SATURATION AND MULTIMOIRBIDITY



Plasma transferrin levels were also lower in HIV-infected group (36.70 ± 16.08 vs. 44.66 ± 16.34 µmol/L), but with no significant difference (p < 0.061). In contrast with this plasma ferritin levels were significantly higher (386.94 ± 180.31 µg/L vs. 143.57 ± 48.29 µg/L) in HIV-infected vs. non-HIV infected (p< 0.001).

Lower levels of serum iron, TIBC, transferrin and transferrin saturation together with higher ferritin levels significantly correlate with CD4+ T cells count <350 cells/mm^3 and with occurrence of multimorbidity (p=0.001) in HIV-infected group and in contrast to non-HIV group.

CONCLUSION:

Since lower levels of serum iron, TIBC, transferrin and transferrin saturation as well as with higher ferritin levels significantly correlate with multi-morbidity occurrence in HIV/AIDS-patients these parameters could possibly serve as surrogate markers of preterm aging in HIV infected patients.

ACKGNOWLEGMENT

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