Rigshospitalet

22th Conference on Retroviruses and Opportunistic Infections 2015 Seattle

Altered Body Composition and Inflammation in HIV Infection with Type 2 Diabetes

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Background

Chronic inflammation is a constant finding in HIV infection. Likewise, inflammation plays an important role in the pathogenesis of type 2 diabetes (T2D). Furthermore, T2D is linked with obesity, insulin resistance, and decreased levels of anti-inflammatory adipokines. Little is known about the combined effect of HIV infection and T2D on body composition and inflammation. We hypothesized that HIV-infected persons with T2D have altered fat distribution and higher level of inflammation compared to HIV-infected persons without T2D.

Methode

Cross-sectional study including 36 HIV-infected persons on combination anti-retroviral therapy (cART) and with HIV RNA < 200 copies/mL (n=18 with T2D (HIV+T2D+), n=18 without T2D (HIV+T2D-)), and 44 HIV-negative persons (n=19 with T2D (HIV-T2D+) and n=25 without T2D (HIV-T2D-). Groups were matched on age and sex. In addition groups of HIV-infected persons were matched on CD4 cell count. DXA–scans were performed to evaluate fat distribution. Pro-inflammatory interleukin (IL)-6 and anti-inflammatory adiponectin were measured on snap-frozen plasma using Human IL-6 Kit V-PLEX and Human Adiponectin Assay (Meso Scale Discovery, Rockville, Maryland, USA). Differences between groups were analyzed using one-way ANOVA and *t* test. Data are given as mean and 95% Confidence Interval.

Results

Trunk fat mass/ limb fat mass ratio in HIV+T2D+ was elevated compared to HIV-T2D+ and HIV-T2D, but not when compared to HIV+T2D- (Fig. 1). HIV+T2D+ tended to have higher trunk fat mass (17.2 kg (13.5-20.8)) compared to HIV+T2D- (12.4 kg (8.9 – 15.9), p=0.057) and HIV-T2D- (13.0 kg (11.5-14.6), p=0.020, but not compared to HIV-T2D+ (18.6 (16.2-21.0), p=0.495) (Fig. 2). IL- 6 was elevated in HIV+T2D+ compared to HIV+T2D- and HIV-T2D- but not when compared to HIV-T2D+ (Fig. 3). Adiponectin was decreased in HIV+T2D+ compared to HIV+T2D- and HIV-T2D- but not when compared to HIV-T2D+ (Fig. 4). Furthermore, adiponectin was negatively correlated to trunk fat mass/ limb fat mass ratio in all four groups: HIV+T2D+ p= 0.019 r= -0.546, HIV+T2D- p=0.006, r= -0.622, HIV-T2D+ p= 0.006, r= -0.603, HIV-T2D- p<0.738, r=-0.662.

Poster board number 803

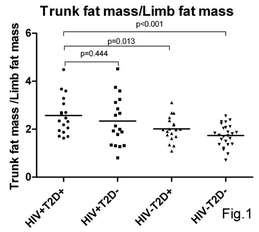


Fig.1

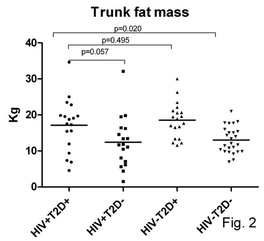


Fig. 2

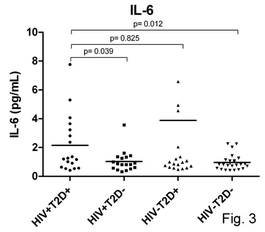


Fig. 3

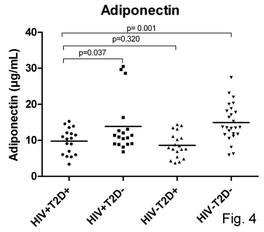


Fig. 4

	HIV+T2D+	HIV+T2D-	HIV-T2D+	HIV-T2D-	P
N	18	18	19	25	
Age (years)	56 (52-60)	55 (50-61)	57 (54-60)	57 (54-59)	0.801
Gender (% male)	89	94	68	88	0.127
CD4 count (cells/µL)	692 (539-845)[a]	716 (526-905)	1300 (988-1611)	820 (703-936)	<0.001
CD8 count (cells/µL)	891 (745-1037)[a]	1040 (766-1314)	625 (471-780)	435 (353-518)	<0.001
Nadir CD4 (cells/µL)	188 (113-262)	219 (118-320)	-	-	0.608
HIV RNA (copies/mL)	29 (13-44)	29 (16-42)	-	-	0.998
Time since HIV diagnosis (months)	164 (110-220)	205 (147-263)	-	-	0.296
Treatment duration (months)	119 (83-156)	125 (87-164)	-	-	0.622
Fasting BG (mmol/L)	8.4 (7.1-9.7)[b,c]	5.2 (5.0-5.4)	8.8 (7.3-10.3)	5.3 (5.1-5.6)	<0.001
BMI	27 (24-29)[a,c]	26 (23-29)	29 (26-32)	25 (24-26)	0.003

Differences between groups are analyzed using one-way ANOVA. Results are given as mean and 95% Confidence Interval. a, b, c, are analyzed using t-test; a: p>0.05 vs. HIV+T2D-, b: p<0.05 vs. HIV+T2D-, c: p>0.05 vs. HIV-T2D+. BMI: Body Mass Index.

Conclusion

The combination of HIV infection and T2D had adverse effect on body composition and inflammation. Impact of T2D on inflammation seemed to be more pronounced than that of HIV infection. Body composition was altered in both HIV-infected persons and those with T2D. Our results suggest that persons with both HIV infection and T2D may be especially vulnerable to altered body composition and inflammation possibly leading to increased risk of cardiovascular disease.

