

Identifying predictors for progression of atherosclerosis in HIV-infected patients in Hong Kong (MSS 179R)

Executive summary

Aims and Objectives

Cardiovascular diseases are one of the major causes of morbidity and mortality in HIV-infected patients in the HAART era. The scope of the problem of metabolic and cardiovascular diseases in HIV-infected patients in the Asian/Chinese population is largely unknown.

In this study, the problem of subclinical atherosclerosis and associated risk factors in HIV-infected patients in Hong Kong is evaluated. The objectives were:

1. To evaluate the progression of atherosclerosis in HIV-infected patients in Hong Kong.
2. To examine clinical and biological risk factors associated with atherosclerosis.
3. To evaluate the role of inflammatory biomarkers in predicting progression of atherosclerosis in this patient group.

Project design and study subjects

A prospective, case-control study was performed among adults attending an HIV Metabolic clinic in Hong Kong (n=61); with age- and gender-matched, HIV-uninfected individuals as controls (n=30). Carotid intima media thickness (cIMT) was measured at baseline and 24 month. Body composition, metabolic, and inflammatory biomarkers (including HOMA-IR, LDL cholesterol particle size, hsCRP, adiponectin) associated with cIMT change were analyzed; their predictive performances were estimated using ROC analyses.

Main achievements

HIV-infected patients (mean±SD age 49.8±11.4years, 89% male, 48% non-smoker, 97% Chinese) more frequently had hypertension, diabetes, dyslipidemia, lower limb fat percentage and smaller LDL cholesterol particle size. At baseline, cIMTs were 0.790mm (IQR 0.705-0.890mm) and 0.710mm (IQR 0.650-0.833mm) in HIV-infected patients and controls respectively ($P=0.013$); annual rates of change were +0.0075(0.0000-0.0163) and 0.0000(-0.0022-0.0000)mm/year respectively ($P<0.001$). After adjustment for conventional cardiovascular risk factors, HIV status was independently associated with cIMT progression (β -coefficient +0.012, 95%CI 0.006-0.019; $P<0.001$).

Lower limb fat percentage (unadjusted OR 0.877, 95%CI 0.798-0.963, $P=0.006$), lower adiponectin level (unadjusted OR 0.332, 95% CI 0.119-0.926 per log increase, $P=0.035$), and 'LDL cholesterol subclass pattern type B' (unadjusted OR 2.824, 95% CI 0.895-8.906, $P=0.077$) were associated with greater progression in cIMT. Using AUC-ROC analyses, it was found that the combination of limb fat percentage, 'LDL cholesterol subclass pattern type B' and adiponectin level best predicted cIMT progression, with an AUC value of 0.80 (95% CI 0.68-0.91, $P<0.001$). The Framingham risk score, when applied alone, had a poor predictive value (AUC 0.52, 95%CI 0.36-0.67, $P=0.834$); and it did not further improve prediction when added to the above combination.

Conclusion

HIV-infected Asian patients have more rapid atherosclerosis progression than uninfected healthy subjects. Limb fat percentage, LDL cholesterol particle size, and adiponectin level may identify at-risk patients for early intervention.