BACKGROUND

The Metabolic Syndrome (MS) is a cluster of metabolic disorders that lead to a 2-fold higher risk of cardiovascular disease compared with the general population. Components of the metabolic syndrome includes elevated TG, low HDL, hypertension, hyperglycemia and abdominal obesity. In HIV, the relative contribution of the risk factors defining MS is not well understood, and some of the metabolic changes in the syndrome may be closely related with insulin resistance and possibly as a result of smoking known to impair glucose metabolism. The aim of this study is to investigate the baseline prevalence of the syndrome and factors associated with MS in HIV-infected individuals.

OBJECTIVES

To investigate the baseline prevalence and predictors of the MS by using the American NCEP ATP III guidelines (National Cholesterol Education Panel, Adult Treatment Panel III) among patients at entry to the D:A:D Study.

METHODS

D:A:D is a prospective, observational cohort study following >33,000 HIV-1 infected patients from Europe, Australia and USA, to date, 10,111 patients with complete baseline measurements on the risk factors in the MS definition were included. We performed an exploratory analysis of the prevalence of the MS and components. The MS was defined by using modified NCEP ATP III criteria, i.e., the presence of three or more of the following:

- Plasma HDL cholesterol (HDL) <1.0 mmol/L (men), <1.3 mmol/L (women)
- Plasma Triglycerides (TG) >1.7 mmol/L
- Hypertension (HYP) blood pressure >130/85 mm Hg (or anti-hypertension treatment)
- Diabetes mellitus (DM) (or anti DM treatment)
- Body mass index (BMI) ≥30 kg/m2

RESULTS

Metabolic syndrome

In the study population (N=10,111) 20% fulfilled the NCEP definition for MS. The patients with MS were significantly older than patients without MS. Cigarette smoking (current) was higher in the patients without MS (0.53 versus 0.43% (p=0.0001)). Lipodystrophy were more common among patients with MS, 38% versus 21% in those without MS (p=0.0001). There were differences in the two groups in exposure to antiretroviral therapy, with more PI treatment in the MS group compared to the non-MS group (Table 1).

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The prevalence of the MS was assessed for the study population, overall, and separately for men and women. Factors independently associated with the presence of MS at baseline were assessed from a logistic regression model, that included baseline values of: gender, age, cumulative exposure to protease inhibitors (PIs), cumulative exposure to non-nucleoside reverse transcriptase inhibitors (NNRTIs), smoking status, CD4+ lymphocyte count, HIV RNA, physician defined lipodystrophy, and cohort.

Factors independently associated with MS at baseline

After adjustment, the strongest relationships were seen with lipodystrophy (Odds Ratio OR 1.91 (95% Confidence interval 1.69-2.15)) male gender (1.70 (1.53-2.01), and age (OR 1.22 (1.18-1.25) per 5 years increment) (Table 2).

DISCUSSION

The prevalence of MS among 10,111 HIV positive was 20% at baseline in the D:A:D study. - 22% in men and 12% in women. The prevalence of each of the components of the MS as well as the overall prevalence of MS in men and women, are illustrated in Figure 1.

Gender and age

Men had a higher prevalence of the syndrome than women, with a prevalence of 22% compared to 13% in women. The prevalence of each of the components of the MS as well as the overall prevalence of MS in men and women, are illustrated in Figure 1.

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PERSPECTIVES

Studies within the D:A:D will explore the incidence of MS over 7 years of follow-up and is investigating whether the concurrence of the MS results in a better prediction of CVD than inclusion of the individual risk factors in a standard multiplicative model. These analyses will seek to identify specific interactions between the individual risk factors.

(c) Executive summary of the third report of the national cholesterol education program (NCEP) expert panel on detection, evaluation and treatment of high cholesterol in adults (Adult treatment III). JAMA 2001;285(9):1297-87.