ABSTRACT

Introduction

Infection with Human Immunodeficiency virus (HIV) is a risk factor for endothelial disease which can manifest as venous thromboembolic disease (VTE), arterial thrombosis and atherosclerosis and microvascular disease specifically thrombotic microangiopathies (TMAs) including disseminated intravascular coagulation (DIC) and Thrombotic Thrombocytopaenic Purpura (TTP). The procoagulant state in these patients appears to be multifactorial in pathogenesis and linked to the chronic inflammatory state in these patients. The primary hypothesis is that these disparate clinical presentations reflect the baseline haemostatic activation in these patients.

Methods

Data and samples were collected from 5 different sources – HIV-infected patients without documented arterial disease, HIV-infected patients with documented arterial disease, HIV-infected patients and HIV-uninfected patients with documented thrombotic microangiopathic disease and healthy HIV-uninfected controls. Two extensive literature reviews were undertaken to identify both cellular and biochemical markers of increased coagulation The activation status of both monocytes and platelets and production of procoagulant microparticles were analysed by flow cytometry and compared with markers of HIV disease and chronic inflammation. Levels of the lipid mediators and cardiovascular biomarkers were assessed in a cohort of HIV-infected patients *ex vivo* and compared with markers of virological suppression and immunological recovery as well as markers of cardiovascular disease. The contribution of HIV as a risk factor for disseminated intravascular coagulation was assessed and the laboratory presentation was compared between HIV-infected and uninfected individuals.

Results

Thrombosis in HIV is linked to chronic inflammation and endothelial dysfunction. Markers of endothelial cell activation are increased in HIV-infected patients without overt cardiovascular disease and correlate with viral load. Patients with HIV are more likely to have platelet and monocyte activation and produce microparticles which are rich in tissue factor. Clinically, these patients present with increased risk of thrombotic microangiopathies.

Conclusions

HIV associated vascular disease is multifactorial in origin with cellular factors (specifically monocytes, neutrophils and platelets) and humoral factors (including factors like LP-PLA_2). Clinical presentation is pleomorphic but includes increased risk and more severe presentation of arterial and microvascular disease