The impact of abacavir sulphate and tenofovir on platelet function in vitro and in vivo

Smyth E1, Nelson M2, Emerson M1

1 Platelet Biology Group and 2 Chelsea and Westminster NHS trust, National Heart and Lung Institute, Imperial College London, London, UK.

### Background

- Highly active antiretroviral therapy (HAART) has considerably improved the life expectancy of HIV-infected individuals.
- Nucleoside reverse transcriptase inhibitor (NRTI) abacavir sulphate, may also be associated with increased risk of cardiovascular complications such as myocardial infarction (MI).
- Platelet aggregation underlies thrombotic events such as MIs.

### Aims

- To assess the potential impact of two NRTIs, abacavir sulphate and tenofovir on cardiovascular risk by assessing their impact on the function of healthy platelets in vitro and in vivo.

### Methods

- Platelet aggregation was investigated in vitro by measuring changes in light transmission in isolated human platelets.
- Platelet aggregation was measured in vivo in anaesthetised C57bl/6 mice by measuring radiolabelled platelet thromboembolism in the pulmonary vasculature.

### Results

- Abacavir sulphate significantly inhibited collagen (A) and thrombin (B) induced platelet aggregation in vitro.
- Abacavir sulphate had no effect on agonist-induced platelet aggregation in vivo.

### Conclusions

- Tenofovir may offer protection against platelet-driven thrombotic events via a direct action on the platelet.
- Abacavir sulphate has no direct effect on platelets but when administered systemically may enhance the risk of MI by an indirect effect on platelets.

Administration of abacavir sulphate to patients may increase the risk of MI by indirectly affecting platelets.