Journal of the International AIDS Society

Poster presentation

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A cross-sectional comparison of renal function in patients on stable abacavir (ABC) or tenofovir (TDF) containing therapy

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from Ninth International Congress on Drug Therapy in HIV Infection
Glasgow, UK. 9–13 November 2008

Published: 10 November 2008

Journal of the International AIDS Society 2008, **11**(Suppl 1):P129 doi:10.1186/1758-2652-11-S1-P129

This abstract is available from: http://www.jiasociety.org/content/11/S1/P129

Purpose of the stud

Renal toxicity is an important complication of both HIV infection and antiretroviral therapy; drug-related toxicity may differ by NRTI backbone. We analysed markers of renal function in patients stable on ABC or TDF.

Methods

Prospective, cross-sectional, single-centre study of patients stable for >6 months on ABC- or TDF-based therapy (naïve to TDF and ABC, respectively) and <50 cps/ml. Renal markers collected: plasma urea, creatinine, cystatin-c (endogenous cysteine proteinase inhibitor produced at a constant rate). Individuals underwent 24-hour urine collection (creatinine clearance and protein quantification) or spot urine for protein and N-acetyl-beta-glucosaminidase (NAG):creatinine ratio. NAG, secreted by renal tubular cells, is a sensitive marker of proximal tubular damage; measuring NAG:creatinine ratio controls for urine volume. Demographics, drug history, CD4 and VL were collected. Parameters independently significantly associated with abnormal renal function by univariate analysis ($p < 0.15$) were entered into a multivariable regression model. Measured CrCl and eGFR have been presented previously.

Summary of results

391 subjects (145 on ABC, 246 on TDF) were recruited. Most were male (95% on ABC, 92% on TDF); median age (48 vs. 46 years; $p = 0.021$) and CD4 count (552 vs. 475; $p = 0.007$) were higher in ABC recipients. By multivariable modelling, factors associated with MDRD eGFR <90 were older age (>53 vs. <46 years; $p < 0.001$) and elevated cystatin c (>0.86 vs. <0.68; $p = 0.037$). Five subjects on ABC (3.4%) and nine on TDF (3.7%) had MDRD GFR <60 (p = ns). Cystatin c was elevated (>0.96) in 7.6% and 10.2% of ABC and TDF recipients, respectively (OR for ABC 0.73; $p = 0.396$); there was no relationship between cystatin c elevations and duration of ABC or TDF. By multivariable analysis, there was a trend to greater risk of elevated cystatin c with increased age ($p = 0.065$ for <40 vs. >53 years). Hypophosphataemia (≤0.8 mmol/l) was detected in 13% and 16.5% of ABC and TDF treated subjects, respectively (OR for ABC 0.76; $p = 0.361$). Seven subjects had grade 3 hypophosphataemia (0.33–0.64 mmol/l), three on ABC (2.2%) and four on TDF (1.7%). NAG:creatinine ratio was measured in 296 patients from spot urine and was elevated (≥2.4) in 7% on ABC and 7.1% on TDF (p = ns).

Conclusion

Significant renal abnormalities were infrequent. For renal end-points we did not detect a statistically significant or clinically relevant safety difference between the ABC and TDF in our cohort.