Modelling the long-term clinical outcomes of the novel single-tablet regimen bictegravir/emtricitabine/tenofovir alafenamide (B/F/TAF) in the UK

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Objective

- This research aimed to predict the long-term clinical and cost-effectiveness outcomes of bictegravir/emtricitabine/tenofovir alafenamide (B/F/TAF) versus alternative commonly used integrase strand transfer inhibitor (INSTI) regimens in the UK setting.

Background

- B/F/TAF combines the novel INSTI, bictegravir, with the guideline-recommended F/TAF backbone.
- B/F/TAF is highly efficacious, with a safety profile that may improve short-term tolerability and help reduce the long-term occurrence of non-AIDS related morbidities (NARMs).

Methods

- A cohort Markov model (Figure 1) was used to evaluate B/F/TAF versus other INSTI-based regimens (dolutegravir/abacavir/lamivudine [DTG/ABC/3TC], elvitegravir/cobicistat/emtricitabine/tenofovir alafenamide [E/c/F/TAF], DTG+F/TAF and raltegravir+F/TAF [RAL+F/TAF]) for treating HIV in the UK setting. INSTI comparator regimens were chosen as they form the current standard of care in the UK.
- The base case used a lifetime horizon and considered both treatment-naïve and treatment-experienced, virologically suppressed patients. Patients could receive up to two subsequent lines of therapy in the model, incorporated via multiple mixed baskets of regimens.

Results

- In the model base case, B/F/TAF was associated with a gain in quality-adjusted life years (QALYs), fewer comorbid events and cost savings associated with management, adverse events and NARMs versus all comparators.
- The results of deterministic sensitivity analyses (DSAs), where input values were varied by 20% or their standard deviation (where available), versus all comparators.

Conclusions

- The NARMs considered in the model were cardiovascular disease (CVD), chronic kidney disease (CKD) and bone fractures. Published hazard ratios were used to differentiate between treatments and non-AIDS risk groups.
- Central nervous system (CNS) and gastrointestinal (GI) treatment-related adverse events (TRAEs) were also considered in the model.
- UK-specific model inputs were informed by standard published literature reviews, network meta-analyses, target searches and discussion with expert clinicians using standard published sources where possible.
- A published hazard ratio (HR) for treatment discontinuation was applied to patients on multiple-tablet regimens (MTRs), as single-tablet regimens have demonstrated significantly greater persistence than MTRs.5
- To reflect confidential net price discounts commonly applied in HIV, treatment acquisition costs for B/F/TAF and comparators were decreased in regular intervals from list prices, to provide a range of plausible incremental cost-effectiveness ratio (ICER) results.
- In the treatment acquisition cost scenarios (Figure 3), B/F/TAF was estimated to have a cost-effective or dominant ICER in more than half of the tested scenarios at a willingness-to-pay threshold of £20,000/QALY.
- B/F/TAF was estimated to provide the equal longest time on first-line treatment (10.74 years) of the considered regimens alongside E/c/F/TAF.

Strengths and Limitations

- The model built upon approaches taken in other cost-effectiveness models of HIV to date, considering comparable numbers of NARMs and treatment lines.4 A wide range of HIV regimens were included as subsequent therapies reflecting currently used treatment options in UK clinical practice.
- Due to a lack of available data, the model did not consider drug-drug interactions (DDIs). These are expected to differ in terms of frequency between treatment regimens, however were expected to have a minimal impact on model results.

References


Table 1: Scenario analysis of ICERs (£/QALY) for B/F/TAF versus comparator treatments

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Discount applied to list price</th>
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Table 2: B/F/TAF and RAL+F/TAF annual cost

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Figure 1: Model structure

Figure 2: Tornado plot showing results of the ICER DSA versus DTG/ABC/3TC

Figure 3: Scenario analysis of ICERs (£/QALY) for B/F/TAF versus comparator treatments

Figure 4: Acknowledgements

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