COST-MINIMISATION ANALYSIS OF SUCROFERRIC OXYHYDROXIDE AND SEVELAMER CARBONATE IN PATIENTS ON DIALYSIS WITH SECONDARY HYPERPARATHYROIDISM IN THE UNITED KINGDOM

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Background

- Sucrofferic oxyhydroxide (SFOH, Velphoro®) is a non-calcium, iron-based chewable phosphate binder approved for the control of serum phosphorus levels in adult chronic kidney disease (CKD) patients on heaemodialysis or peritoneal dialysis.
- In patients with CKD on dialysis vitamin D receptor agonists (VDRAs) are administrated for the control of secondary hyperparathyroidism[1].
- In a post hoc analysis of the pivotal Phase 3 studies (NCT 01324128 and NCT 01464190) of SFOH compared with sevelamer carbonate (SEV) the potential effect of SFOH on oral VDRAs has been evaluated. Parathyroid hormone (iPTH) has been used as a pharmacodynamic marker [2-4].
- SFOH had no apparent interaction with oral VDRAs. The reduction in iPTH was similar with SFOH in patients receiving oral or intravenous (IV) VDRAs [2-4].
- In contrast, a potential interaction between SEV and oral VDRAs has been observed, but not in patients who received IV VDRAs. These findings were consistent with a pharmacokinetic study, which demonstrated that SEV reduced the bioavailability of oral VDRAs when administered together [5].

Objective

- A cost-minimization analysis (CMA) was conducted to estimate and compare the treatment costs of SFOH with SEV from the United Kingdom (UK) National Health Service (NHS) perspective.

Methods

- The CMA assumed similar efficacy for SFOH and SEV.
- It was assumed that patients on SFOH are treated exclusively with oral VDRAs. Patients on SEV are treated only with IV VDRAs due to the drug-drug interactions with oral VDRAs highlighted in the post hoc analysis (figure 1) [4].
- Patients received either SFOH (1.5 g/day [3 tablets/day]) and oral VDRAs (0.28 µg/day) or SEV (6.4 g/day [8 tablets/day]) and IV VDRAs (1.84 µg/day) (Figure 1). SFOH and SEV dosage was derived from two Phase 3 clinical trials.
- Drug acquisition costs were determined on the basis of the UK wholesale price, as provided by the British National Formulary.
- Costs for the administration of IV VDRAs and treatment of adverse events were not included.
- Various one-way sensitivity and scenario analyses have been performed.

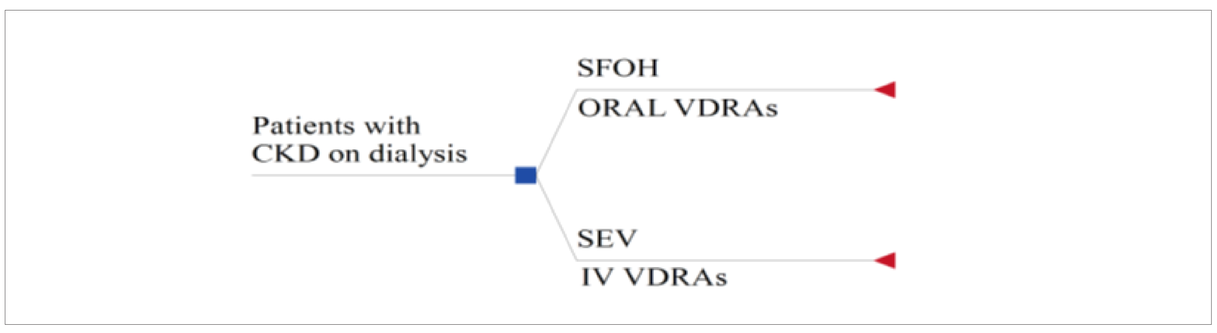

Figure 1. Overview of decision model

Results

- Mean annual treatment costs per patient were £2,178 for SFOH and £2,578 for SEV. They were £122 for oral VDRAs and £930 for IV VDRAs.
- Mean annual total treatment costs per patient were £2,300 for SFOH with oral VDRAs and £ 3,508 for SEV with IV VDRAs.
- Treatment of SFOH with oral VDRAs resulted in annual cost-savings per patient of £1,207 when compared to treatment of SEV with IV VDRAs (base-case estimate, Table 1).

	SFOH + oral VDRAs		**SEV + IV VDRAs**	
Mean Annual Treatment Costs per Patient	**SFOH**	£2,178 (€2,806)	**SEV**	£2,578 (€3,321)
	Oral VDRA	£122 (€157)	**IV VDRA**	£930 (€1,198)
	Total Costs	£2,300 (€2,963)	**Total Costs**	£3,508 (€4,519)
Annual Cost Savings per Patient	£1,207 (€1,555)			

Table 1. Base-case estimate of annual treatment costs (exchange rate taken from: www.oanda.com, 28/04/2016)

- One-way sensitivity analyses assessed the impact of varying the treatment costs by ±25%, further confirming the results of the base-case analysis (Figure 2).
- SFOH with oral VDRAs compared to SEV with IV VDRAs resulted in cost-savings in all analyses ranging from £563 (€723) to 1,777 (€ 2,283).

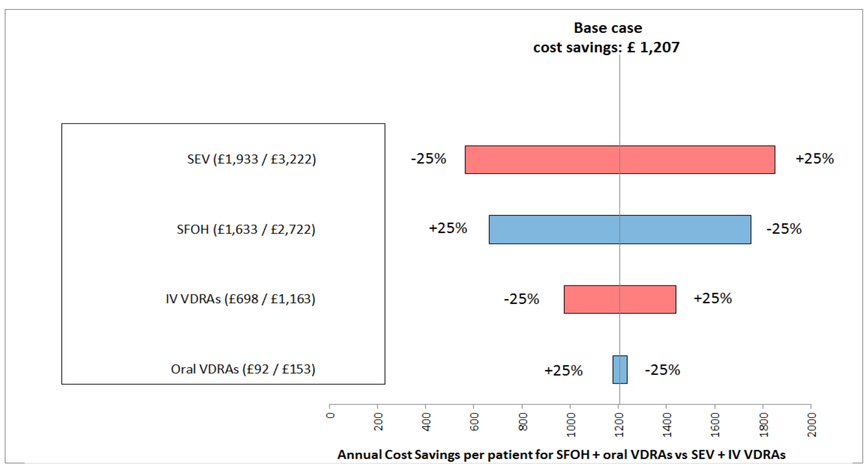

Figure 2. Tornado diagram showing results of the one-way sensitivity analyses

- The base-case analysis assumed that patients on SFOH will be treated only with oral VDRAs. Two scenarios analyses have tested the impact of increasing the percentage of IV VDRA use (+25% and +50%) for patients on SFOH (Figure 3).

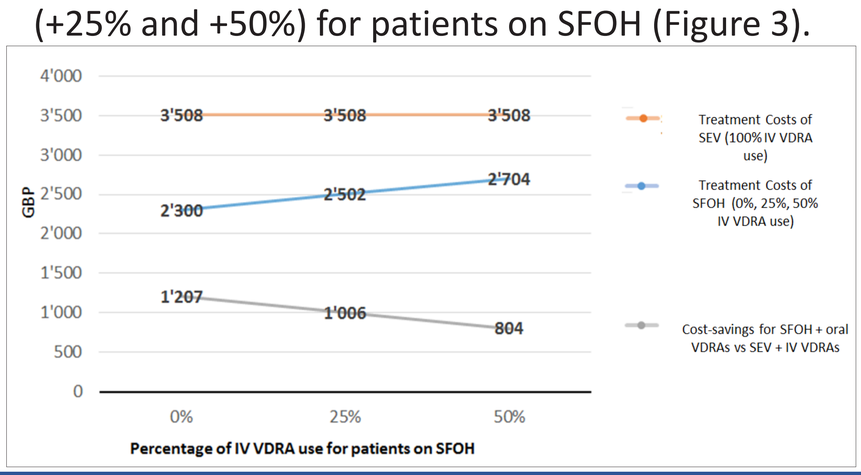

Figure 3. Scenario Analyses showing maintained cost-savings for SFOH vs SEV if IV VDRA use is increased by 25% and 50% for patients on SFOH

Conclusions

- A post hoc analysis from two pivotal Phase 3 studies of SFOH versus SEV indicated that there is no apparent interaction of SFOH with oral VDRAs. However, drug-to-drug interactions of SEV with oral VDRAs have been observed. Consequently, SEV patients are expected to shift to more costly IV VDRAs.
- A CMA compared the treatment costs of SFOH and oral VDRAs with SEV and IV VDRAs.
- The CMA suggests that cost-savings (£1,207, €1,555) could be generated by using SFOH instead of SEV and, in consequence, allowing SFOH patients to use less costly oral VDRAs and avoid IV VDRAs, from the UK NHS perspective.
- Main limitations of the CMA: (1) data have been collected as a post hoc analysis, (2) assumption that patients on SFOH received oral VDRAs only and (3) costs of IV VDRA administration and adverse events were not included.
- These results have been further tested and validated in one-way sensitivity and scenario analyses. However, real-world data are needed to confirm these findings.

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