Cost and healthcare resource utilisation consequences of switching from existing long-term prophylaxis to donidalorsen in hereditary angioedema

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Introduction

- Hereditary angioedema (HAE) is a rare, chronic genetic disorder characterised by debilitating, unpredictable and potentially fatal swelling attacks, often affecting the extremities, gastro-intestinal tract and upper airway.[1]
- In HAE due to C1-inhibitor (C1-INH) deficiency or dysfunction, excessive bradykinin production increases vascular permeability and causes angioedema.[1]
- Treatment management includes on-demand therapies to treat attacks when they occur and long-term prophylaxis (LTP) to reduce attack frequency and disease burden.[2,3]
- Despite advances in treatments, HAE attacks and their management drive substantial healthcare resource utilisation (HCRU) and cost.[2,3]
- Donidalorsen is an RNA-targeted antisense oligonucleotide (ASO) approved in the EU, UK and Switzerland for routine prevention of recurrent HAE attacks in patients aged ≥12 years.
- One-year switch data from OASISPlus are available, however, the economic consequences of switching from LTP to donidalorsen have not yet been evaluated.[4]

Objective

- To quantify the economic and HCRU impact of switching from LTP to donidalorsen in patients with HAE in the UK.

Methods

- An Excel-based economic cohort model was developed to assess the economic and HCRU impact of donidalorsen versus current standard of care (SoC) over 5 years in UK patients with HAE aged 12 years and older.
- **Comparators:** SoC comprised berotralstat, lanadelumab and C1-inhibitors.
- **Population:** The model was based on a total LTP cohort of 779 patients[12-14], and excluded LTP acquisition and administration costs.
- **Uptake:** Hypothetical uptake assumptions were used, with donidalorsen uptake assumed to increase from 2% in year 1 to 5%, 10%, 15% and 25% in years 2-5, respectively, corresponding to 195 patients switching to donidalorsen by year 5.
- **Efficacy:** Published one-year OASISplus switch cohort data were used to estimate HAE attack rates at baseline and after switching to donidalorsen.[4]
- **Other Inputs:** Cost, population, attack location distribution, and HCRU inputs were sourced from published literature and relevant databases.[4-15]
- **Outcomes:** HCRU outcomes included Accident and Emergency (A&E) visits, inpatient days and consultant-led outpatient appointments.

Results

- Donidalorsen was estimated to deliver cumulative savings over 5 years of £4,924,901 versus SoC when accounting for attack-related costs, which comprised on-demand treatment use and HCRU.
- The cumulative number of attacks and on-demand treatments avoided was 2,820, corresponding to savings of £4,565,464 (Figure 1).
- HCRU avoided was associated with savings of £359,437 over 5 years.
- Annual management cost savings (on-demand and HCRU costs) increased with donidalorsen uptake, from £169,709 in year 1 to £2,209,672 in year 5 (Figure 2).
- Attacks avoided were greatest for peripheral/skin (1,297) and abdominal (959) attacks, with 141 facial, 85 laryngeal and 338 multiple-location attacks avoided (Figure 3).
- Avoided HCRU comprised 338 A&E visits, 277 consultant-led outpatient appointments and 168 inpatient days (Figure 4).
- Switching from existing LTP to donidalorsen also avoided 8,232 days affected by attacks over 5 years.

Figure 1. Total cost savings, attacks avoided, and HCRU avoided over 5 years vs. SoC[a]

TOTAL COST SAVINGS

£4.92m

Cost savings generated over 5 years, £4.57m of which are accounted for by on-demand treatment savings

ATTACKS AVOIDED

2,820

Attacks avoided over 5 years, resulting in a total reduction of 8,232 days impacted by attacks

HCRU SAVINGS

783

Visits, appointments and inpatient days avoided, generating savings of £359k over 5 years

Figure 2. Cumulative cost savings across 5 years vs. SoC[b]



Figure 3. 5-year cumulative number of attacks avoided by location[c]

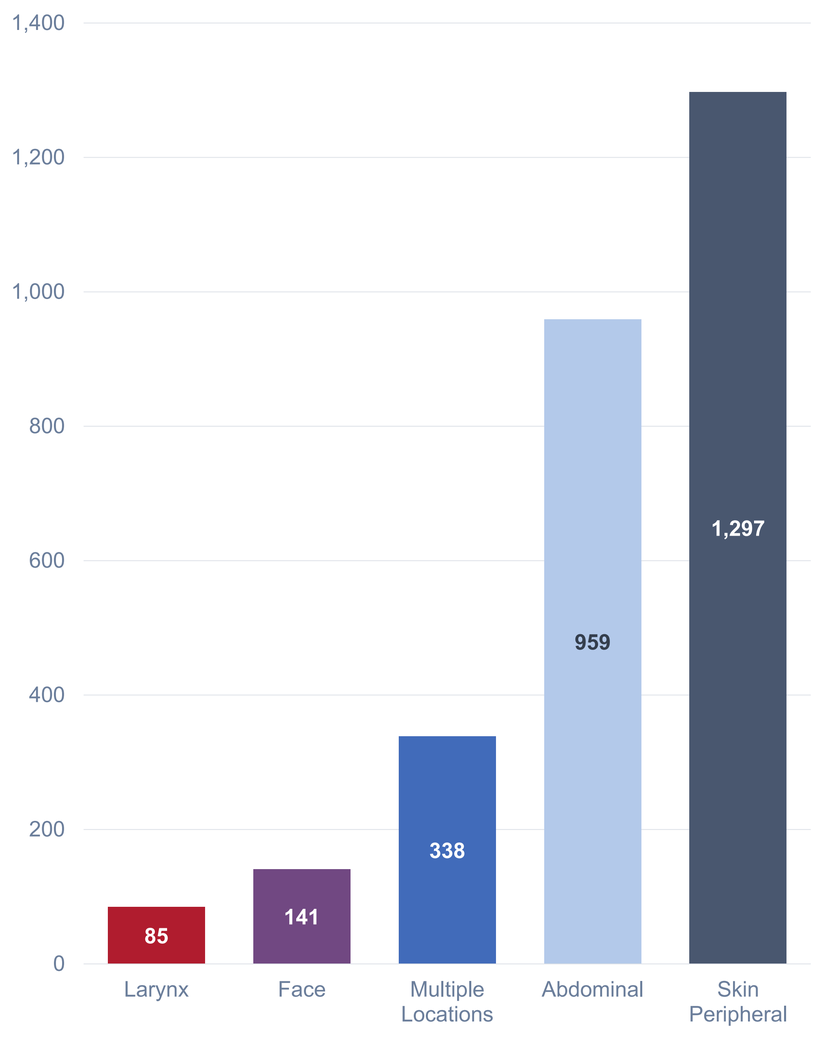

Figure 4. Estimated healthcare resource use avoided over 5 years vs. SoC[d]

338

A&E visits avoided

277

Consultant-led outpatient appointments avoided

168

Inpatient days avoided

[a]Total annual management cost savings and attacks avoided for the modelled UK cohort of patients with HAE receiving proposed management, which includes donidalorsen, versus current management (standard of care). Costs comprise HAE attack-related costs (on-demand treatment and HCRU); treatment administration costs and LTP treatment acquisition costs are excluded.

[b]Annual cost savings with proposed versus current management from attack-related costs (on-demand treatment and HCRU). Cumulative cost savings associated with HAE attacks were £4,924,901 over 5 years.

[c]Attacks avoided with proposed versus current management, by attack location. The distribution of attacks across locations is assumed to follow the distribution provided in Zanichelli et al. 2015 and to be generalisable to the full modelled population; all laryngeal attacks are assumed to be severe.[15]

[d]Healthcare resource use avoided with proposed versus current management: A&E visits, consultant-led outpatient appointments and inpatient days. Each dot represents 1 visit, appointment or inpatient day avoided. Model estimates rounded to whole units. HCRU is applied per attack avoided, using published unit costs for healthcare resource use.[6-11]

Conclusions

- **In this analysis, switching eligible patients with HAE from existing LTP to donidalorsen in the UK was associated with reductions in attack-related HCRU and management costs over five years.**
- **The number of attacks experienced by the cohort substantially reduced each year as patients switched from existing LTP to donidalorsen.**
- **As uptake increased over time, the estimated HCRU and economic benefits also increased.**
- **These findings suggest that donidalorsen may reduce the clinical and economic burden associated with HAE attack management within the UK.**

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