# Cost-minimisation analysis of oral semaglutide versus dulaglutide in patients with type 2 diabetes requiring treatment with a GLP-1 receptor agonist

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## Introduction

- About 13.8% of adults aged >30 years have been diagnosed with diabetes in South Korea [1].
- Treatment of diabetes aims to prevent or delay complications and improve quality of life [2].
- Despite clear guidelines and many available management options, approximately 71.7% of patients in South Korea fail to achieve target levels (<6.5%) of glycated haemoglobin ($HbA_{1C}$) [1].
- Among patients with diabetes, there is also a high prevalence of overweight and obesity, which are risk factors for cardiovascular disease [1, 2].
- Glucagon-like peptide-1 (GLP-1) receptor agonists (RAs) are a class of drugs used in the treatment of type-2 diabetes (T2DM) in adults requiring treatment intensification following insufficient $HbA_{1C}$ control on either metformin and sulfonylurea, or insulin alone or in combination with metformin. GLP-1 RAs offer an effective treatment option not only for the control of glucose levels, but also to support weight loss [3].
- Despite these benefits, GLP-1 RAs are underused because of their unappealing formulation (subcutaneous injection).
- Dulaglutide is currently the only GLP-1 RA reimbursed by Korea's healthcare system.
- An oral formulation of the GLP-1 RA semaglutide has recently become available.
- Clinical studies indicate that oral semaglutide and the injectable GLP-1 RA dulaglutide are equally efficacious and have comparable safety profiles in the management of T2DM [4].
- We evaluated the annual cost of treatment with oral semaglutide compared with dulaglutide in patients with diabetes requiring a GLP-1 receptor agonist in South Korea.

## Methods

- A cost-minimisation analysis was performed from the perspective of South Korea's public healthcare system and in accordance with the South Korean Health Insurance & Review Assessment Survey (HIRA) guidelines for pharmacoeconomic analyses.
- A time frame of 1 year was considered.
- Based on local reimbursement criteria, analyses were performed on two target populations:
  - Oral combination group: patients whose diabetes was inadequately controlled on metformin and sulfonylurea
  - Insulin combination group: patients whose diabetes was inadequately controlled on insulin, with or without metformin
- Cost items were identified by reviewing treatment guidelines, clinical trials, and published economic evaluations.
- Costs were calculated using health-insurance-price-related data for Rybelsus® (oral semaglutide) and Trulicity® (dulaglutide), statistical data, and related literature.
- Both administration and dispensing and outpatient consultation fees for oral semaglutide were calculated based on the pattern of dipeptidyl peptidase 4 inhibitors (DPP4-I), a class of self-administered, oral drugs also used in the treatment of T2DM.
- The analysis included only direct healthcare costs, e.g., outpatient consultation and examination fees, medication costs, and dispensing fees.

## Results

- The unit costs for oral semaglutide and injectable dulaglutide are shown in Table 1 and Table 2, respectively.

**Table 1:** Unit costs for oral semaglutide

| Dosage | Price (KRW) | Initiation, 30 days (KRW) | Titration, 30 days (KRW) | Yearly drug cost (KRW) | Patient distibution (%) |
|---|---|---|---|---|---|
| **3 mg** | 1,664 | 49,909 | - | | |
| **7 mg** | 3,660 | - | 109,800 | 1,276,009 | 78 |
| **14 mg** | 5,940 | - | - | 1,971,464 | 22 |
| **Weighted yearly cost per patient** | | | | **1,429,201** | |

**Table 2:** Unit costs for dulaglutide

| Dosage | Price (KRW) | Initiation, 4 weeks (KRW) | Titration | Yearly drug cost (KRW) | Patient distibution (%) |
|---|---|---|---|---|---|
| **0.75 mg** | 19,796 | - | - | 1,032,220 | 33 |
| **1.5 mg** | 32,129 | 79,184 | - | 1,616,786 | 67 |
| **Weighted yearly cost per patient** | | | | **1,424,312** | |

- Annual total costs, i.e. medication costs and direct healthcare costs for the oral and insulin combination groups, respectively, are shown in Table 3 and Table 4.
- In the oral combination group, oral semaglutide resulted in a weighted average saving of 3,089 KRW per patient compared with dulaglutide.

**Table 3:** Yearly total weighted average cost per-patient for the oral combination group

| Drug | Outpatient consultation fee | Administration & dispensing fee | Examination fee | Medication cost | Concomitant medication cost | Total cost |
|---|---|---|---|---|---|---|
| **Oral semaglutide** | 105,144 | 119,412 | 172,174 | 1,429,201 | 102,769 | 1,928,701 |
| **Dulaglutide** | 114,200 | 118,991 | 171,518 | 1,424,312 | 102,769 | 1,931,790 |
| **Oral semaglutide vs dulaglutide** | | | | | | **-3,089** |

- In the insulin combination group, the expected total weighted average per-patient annual costs in the semaglutide arm were 3,089 KRW lower compared with those in the dulaglutide arm.

**Table 4:** Yearly total weighted average cost per-patient for the insulin combination group

| Drug | Outpatient consultation fee | Administration & dispensing fee | Examination fee | Medication cost | Concomitant medication cost | Total cost |
|---|---|---|---|---|---|---|
| **Oral semaglutide** | 105,144 | 119,412 | 172,174 | 1,429,201 | 549,862 | 2,375,793 |
| **Dulaglutide** | 114,200 | 118,991 | 171,518 | 1,424,312 | 549,862 | 2,378,882 |
| **Oral semaglutide vs dulaglutide** | | | | | | **-3,089** |

## Discussion

- The savings in yearly total costs of oral semaglutide compared with dulaglutide are primarily due to lower outpatient consultation fees (Table 3 and Table 4). Based on the pattern for orally administered DPP4-I, a lower rate of consultations from tertiary hospitals was estimated for oral semaglutide (24.6%) compared with dulaglutide (58.9%), leading to a reduction of 9,056 KRW in the yearly average cost of outpatient consultation fees in the oral semaglutide arm.

## Conclusion

- Cost-minimisation analysis found that oral semaglutide leads to a small per-patient saving compared with injectable dulaglutide in patients with T2DM in South Korea, regardless of baseline therapy.
- In clinical practice, oral semaglutide is therefore unlikely to be more expensive than dulaglutide in patients with T2DM in South Korea.

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**References:**
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