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A Cost-Effectiveness Analysis, with Public Healthcare Payers' Perspective, of Oral Semaglutide Versus Luseogliflozin Hydrate for Patients with Type 2 Diabetes in a Japanese Clinical Setting

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- Oral semaglutide 7mg was projected to improve life expectancy and quality adjusted life years versus Luseogliflozin Hydrate 2.5mg.
- Direct healthcare costs were estimated to be higher with oral semaglutide 7mg compared to Luseogliflozin Hydrate 2.5mg. However, costs associated with the treatment of diabetes-related complications were lower with oral semaglutide 7mg.

Objectives

- Type 2 diabetes mellitus (T2DM) is a serious public health concern that places substantial clinical and economic burdens on healthcare systems in Japan.
- To perform a long-term cost-effectiveness analysis (CEA) evaluating oral Semaglutide against the least expensive SGLT-2 inhibitor (luseogliflozin hydrate) in Japanese patients with T2DM.

Methods

- A cost-utility analysis was performed to evaluate the cost-effectiveness of 7mg QD oral semaglutide versus luseogliflozin 2.5mg, based on the Year 2021 pricing.
- Treatment effects were obtained from the aggregated randomised controlled trial data at Week 26 (+/- 2 weeks), using network meta-analysis.
- The CEA with the public healthcare payers' perspective was conducted using the model built on the JJ Risk Engine risk prediction algorithm by pooling data from 1,748 Japanese patients with T2DM over 7.2 years[1)].
- The base analysis timeframe was set for 30 years, considering the lifetime period of the disease. The treatment duration was assumed to be three years.
- Model inputs and assumptions were varied in deterministic sensitivity analyses and probabilistic sensitivity analyses to evaluate the impact on the outcomes.

Key results

- Baseline characteristics are shown in **Table 1**.
- In contrast with luseogliflozin 2.5 mg, treatments with oral Semaglutide 7mg were associated with improved effectiveness (+0.06 QALY) at a slightly higher total discounted cost (+ ¥87,683) but reduced event costs for complications resulting in ICERs of ¥1,399,233 per QALY (**Table 2** and **Table 3**).
- A probabilistic sensitivity analysis confirmed that these results were robust, and they remained below the cost-effectiveness threshold of ¥5,000,000/QALY with 89.4 percent chance of being cost-effective and resulted in the mean ICER of ¥ 861,701 per QALY (**Figure 1**).

Table 1. Baseline Characteristics of Model Inputs

Baseline characteristics	Value	SD
Age, y	62.00	10.12
% women	49%	0.01
% smoker	24%	0.01
Duration of diabetes	10.90	7.28
HbA_{1c}, %	7.90	0.86
SBP, mm Hg	132.00	13.30
Non-HDL, mmol/L	3.16	0.88
BMI, kg/m^2	23.00	0.00
Atrial fibrillation, %	0.00	0.01
LTPA, % >=3.8 METs-h/week	66%	0.01
Log ACR	0.59	0.01

Abbreviations: BMI - body mass index, ACR - urine albumin-to-creatinine ratio, SBP - systolic blood pressure, NHDL-c - non-HDL cholesterol, LTPA - leisure-time physical activity, METs - metabolic equivalents.

Table 2. Cost-Effectiveness Model Outcomes

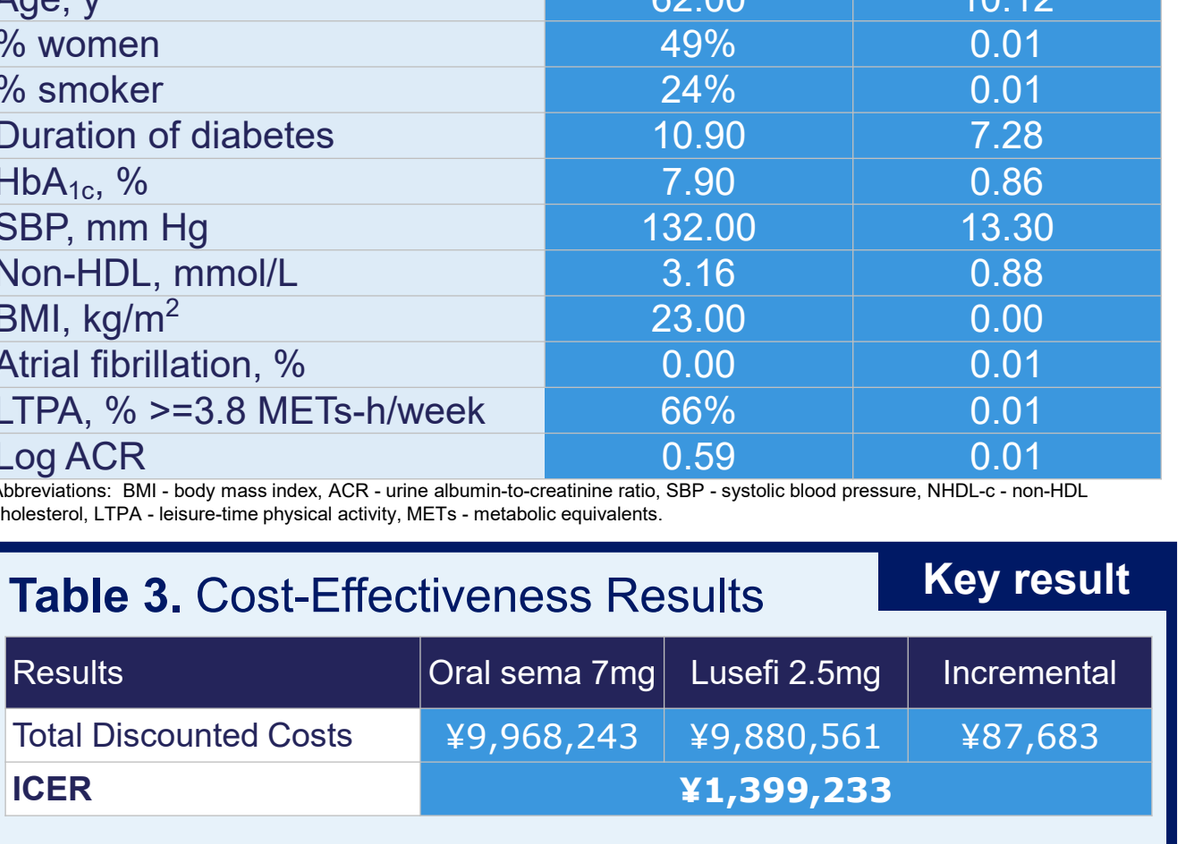
Outcome	Oral sema 7mg	Lusefi 2.5mg	Incremental
Overall survival, y	16.71	16.64	0.07
Percent alive at time horizon	0.0%	0.0%	0.0%
Discounted QALYs	11.32	11.25	0.06
Discounted Costs (¥)	**Oral sema 7mg**	**Lusefi 2.5mg**	**Incremental**
Diabetes drug costs			
Oral sema or Lusefi	¥348,874	¥177,860	¥171,014
Treatment intensification	¥2,078,150	¥2,068,784	¥9,366
Diabetes management (no complications)	¥4,949,778	¥4,930,164	¥19,614
Complications			
Coronary heart disease	¥517,364	¥523,110	-¥5,745
Stroke	¥596,799	¥607,976	-¥11,177
Retinopathy	¥1,238,913	¥1,320,235	-¥81,322
Overt nephropathy	¥34,230	¥35,406	-¥1,176
End-stage renal disease	¥42,697	¥44,613	-¥1,916
Hemodialysis	¥106,532	¥112,793	-¥6,261
Amputation	¥54,906	¥59,620	-¥4,713

Key result

Table 3. Cost-Effectiveness Results

Results	Oral sema 7mg	Lusefi 2.5mg	Incremental
Total Discounted Costs	¥9,968,243	¥9,880,561	¥87,683
ICER	**¥1,399,233**		

Figure 1. Cost-effectiveness acceptability curve



Conclusion

- These findings suggest that oral Semaglutide 7 mg is a cost-effective treatment option compared to the least expensive SGLT-2i, luseigliflozin hydrate 2.5 mg, for patients with T2D and its comorbidities, based on Japanese real-world evidence.
- This may inform decision-makers to allocate healthcare resources efficiently for life-long disease treatments.

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Reference:
1) Tanaka S, Langer J, Morton T, et alDeveloping a health economic model for Asians with type 2 diabetes based on the Japan Diabetes Complications Study and the Japanese Elderly Diabetes Intervention TrialBMJ Open Diabetes Research and Care 2021;9:e002177. doi: 10.1136/bmjdrc-2021-002177