Cost-effectiveness of G5 Mobile rtCGM compared with SMBG in T1DM adults using MDI: the Italian perspective

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Aim

To evaluate the cost-effectiveness of the Dexcom G5 Mobile real-time continuous glucose monitoring (rtCGM) system compared with self-monitoring of blood glucose (SMBG) in people with type 1 diabetes mellitus (T1D) using multiple daily injection (MDI) therapy from the Italian perspective.

Methods

- Quintiles IMS Core Diabetes Model version 9.0[1] was used to assess long-term (50 years) cost-effectiveness of G5 compared to SMBG alone for a T1D cohort
- Baseline characteristics and treatment effect were based on the DiaMonD trial.[2] Other model assumptions were based on published research[4-13]
- Italy-specific parameters were sourced from IMS Health (2017)[15-17]
- Clinical and cost outcomes are discounted at 3% per annum
- Analyses are based on 1000 hypothetical patients and 1000 microsimulations
- One-way sensitivity analyses were done to test the robustness of the results with variable hypoglycemic event scenarios, starting utilities of the cohort, and discount rates.

Results

Table 1: Base Case Values and Sources

BASE CASE PARAMETER [Reference]		ASSUMPTION [Reference]	
		SMBG only	CGM**
Cohort baseline HbA1c [2]		8.6%	
Change in HbA1c [2]		0.4%	-1.00%
Hypoglycemia rates*	NSHE	2900 [6]	1450 [8]
	SHE 1	278 [6]	139 [9,10]
	SHE 2	42 [6]	21 [9,10]
SHEs needing medical services [7]		13%	
Annual intervention costs		€ 953 [11]	€ 6902 †
Utilities and disutilities	Starting utility [12]	0.90	
	Disutility per NSHE [13, 14]	-0.0142	
	Disutility for each SHE 1 [13]	-0.047	
	Disutility for each SHE 2 [13]	-0.047	
Disutility for hypoglycemia progression:		Stable impact (CDM default assumption)	
Direct costs per NSHE [15]		€ 0	
Direct costs per SHE 1 [16]		€ 131.33	
Direct costs per SHE 2 [17]		€ 1928.20	

*, per 100 patient-years

**, G5 Mobile requires two SMBG tests for calibration; analysis conservatively included 2.8 fingersticks/day for G5 calibration based on the REPLACE-BG trial results[18]

† Dexcom data on file

NSHE = Non severe hypoglycemic events

SHE1 = Severe hypoglycemic events requiring non-medical assistance

SHE2 = Severe hypoglycemic events requiring third-party medical assistance

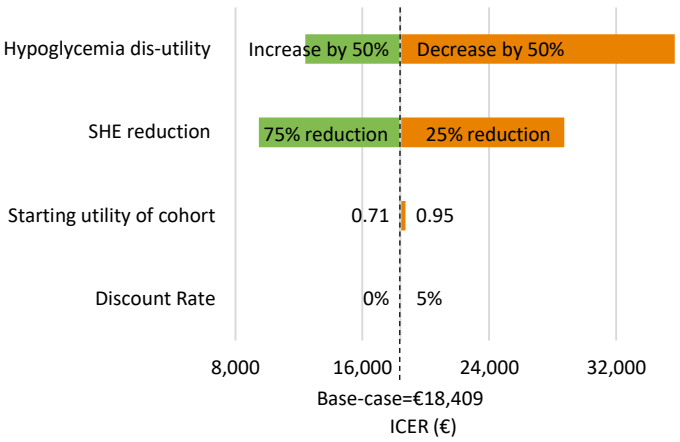
Table 2: Base Case Cost-Effectiveness

OUTCOMES	SMBG	CGM*	Δ
Quality-adjusted life years (QALYs)	4.413	7.638	3.224
Total lifetime direct costs	€210,900	€270,260	€59,360

*, G5 Mobile requires two SMBG tests for calibration; analysis conservatively included 2.8 fingersticks/day for G5 calibration based on the REPLACE-BG trial results[18]

- RtCGM use is associated with an improvement of 3.22 QALYs compared to SMBG alone in T1D adults using MDI
- **Base-case incremental cost-effectiveness ratio (ICER) for G5 Mobile vs. SMBG is €18,409 per QALY**

Figure 1: Sensitivity Analyses



Conclusions

- RtCGM demonstrates acceptable long-term cost-effectiveness compared to SMBG for patients with T1D using MDI therapy.
- Results for Italy are in line with CEA results from other European countries.[19]
- The ICER of €18,409/QALY is well below the assumed willingness to pay threshold of €50,000
- Base-case results were most sensitive to changes in %-reduction in hypoglycemic events and dis-utility associated with hypoglycemic events. Base-case results were minimally impacted by changes in baseline utility of patients and changes in discount rate.
- These results support a "CGM First" treatment approach for intensively managed patients.

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