Cost-Analysis of FreeStyle Libre Devices from the National Health System Perspective in Patients with T2D on Basal Insulin Treatment and Poor Glycemic Control in Spain

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INTRODUCTION

- FreeStyle Libre® systems (FSL) are effective[1-4] and produce cost-savings vs. self-monitoring blood glucose (SMBG) in type 1[5] and type 2 diabetes (T2D) on multiple doses of insulin (MDI)[6].
- Data from RELIEF study suggest that FSL are also effective in patients with T2D receiving basal insulin[4].

OBJECTIVE

This cost-analysis evaluated the use of FSL versus SMBG in patients with T2D on basal insulin with poor glycemic control (HbA1c>8%) in Spain.

METHODS

- A decision analytic model was designed to estimate costs derived from the consumption of glucose monitoring resources, acute diabetic events and chronic diabetic complications. Inputs were extracted from scientific literature and validated by national multidisciplinary experts.
- According to national guidelines[7], a consumption of 2.5 strips/day (€0.55/unit, VAT included)[8] and 2,5 lancets/day (€0.14/unit, VAT included)[8] was considered for SMBG. FSL reduced the usage of strips/lancets by 83%[4].
- An annual consumption of 26 sensors was considered (€3.00/day, VAT included).
- The annual frequency of diabetic complications is presented in Table 1. FSL was associated with a HbA1c decrease of 1.1%[9] (events with FSL were estimated by the reduction per 1% HbA1c).
- Sensitivity analyses (SA) were conducted to test model robustness: 1) Unit cost of strips and lancets at €0.00; 2) Frequency of SHEs: 1.4 events/person-year[27]; 3) Decrease of HbA1c with FSL: 0.45%[28].

Table 1. Clinical inputs and related costs.

	SMBG [↓ with FSL][4]	Cost/event (€, 2024)
MHE (event/person-year)[10]	17.02 [58%]	€3.81 [11,12]
SHE (event/person-year)[10]	2.5 [58%]	€1,364 [13-16]
DKA (event/person-year)[17]	0.003 [68%]	€2,453 [15,17]
Chronic events (event/person-year [18] [Frequency reduction per 1% decreased HbA1c])		
AMI	0.07 [14%] [19]	€1,214 [8]
Angina pectoris	0.09 [10%] [20]	€670 [8,22]
HF	0.06 [16%] [19]	€1,482 [8,23]
Stroke	0.04 [12%] [19]	€3,101 [8,24]
Transitory ischemia	0.04 [12%] [19]	€2,774 [25]
Neuropathy	0.05 [37%] [19]	€3,961 [8,26]
Retinopathy	0.08 [19%] [19]	€3,845 [8]
Peripheric angiopathy	0.05 [17%] [21]	€1,086 [8]
Nephropathy	0.09 [22%] [19]	€1,884 [25]
ESRD	0.06 [22%] [19]	€41,593 [8]

AMI: Acute Myocardial Infarction; DKA: Diabetic Ketoacidosis; ESRD: End-Stage Renal Disease; FSL: FreeStyle Libre® systems; HF: Heart Failure; MHE: Mild Hypoglycemic Event; SHE: Severe Hypoglycemic Event; SMBG: Self-Monitoring Blood Glucose.

RESULTS

- In 1,000 patients FSL would prevent 11,323 acute events (Figure 1) and 124 chronic complications (Figure 2).

Figure 1. Acute events (1,000 patients) *.

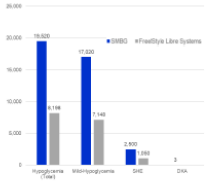
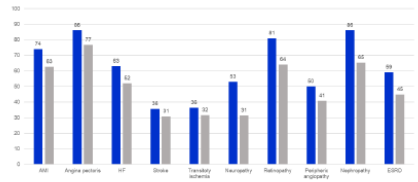


Figure 2. Chronic complications (1,000 patients) *.



AMI: Acute Myocardial Infarction; DKA: Diabetic Ketoacidosis; ESRD: End-Stage Renal Disease; FSL: FreeStyle Libre® systems; HF: Heart Failure; SHE: Severe Hypoglycemic Event; SMBG: Self-Monitoring Blood Glucose. * Time horizon: 1 year.

- The total annual cost per patient was €6,853.87 for SMBG and €5,075.58 for FSL. Thus, in 1,000 patients, FSL would reduce total annual costs by €1,778,289.
- Although FSL sensors increased costs by €1,096,794, cost-savings were observed in the consumption of strips and lancets (-€522,947), mild hypoglycemia (-€ 37,617), SHE (-€ 1,455,204), DKA (-€4,174) and chronic diabetic complications (-€855,141).
- All SAs confirmed cost-savings: 1) -€1,255,342; 2) -€1,137,999; 3) -€1,272,978.

CONCLUSION

Compared to SMBG, FSL by reducing acute and chronic complications in poorly controlled (HbA1c>8%) patients with T2D on basal insulin, lead to significant cost-savings from the Spanish Health System.

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