ISPOR EUROPE 2023
EE628

COSTS ASSOCIATED WITH BASAL INSULINOTHERAPY IN PATIENTS LIVING WITH DIABETES IN FRANCE

Authors : EMERY C[1], BUREAU I[1], ALLALI N[2], BAHLOUL A[2], MAHIEU A[2], DETOURNAY B[1]

1-Cemka, Bourg-la-Reine, France
2-Sanofi, Gentilly, France

Context

Numerous ways of treating diabetes with insulin exist, allowing patients to answer their various needs. For type 1 diabetes (T1D), and in some cases of type 2 diabetes (T2D), **a treatment with long-acting insulin (basal insulin) is often necessary**.

Several studies showed that second-generation basal insulins like insulin glargine 300 U/mL (Gla-300) have a longer duration of action and less intra-day fluctuation and inter-day variability than first-generation ones, such as glargine 100 U/mL (Gla-100).

Beyond these clinical results, very limited evidence have taken into account the treatment costs of basal insulin. Only one French study (1), conducted on a limited number of patients, showed that using second generation basal insulin had an impact on the managing cost of insulin therapy in patients with T2D.

Objectives

The EF-BI study, a nationwide observational and retrospective study was designed to compare the total costs of care associated with the initiation of such basal insulins (BI) in real-life setting in France.

Methodology

This study was conducted using the national French administrative healthcare claims database (SNDS) which covers around 99% of the French population.

Adult patients living with Type 1 or Type 2 Diabetes Mellitus (T1DM or T2DM) who initiated a basal insulin scheme with Gla-300 or Gla-100 +/- other diabetes treatments between January 1, 2016, and December 31, 2020, and without insulin therapy in the previous 6 months were included.

Only patients treated during full years, and for which comprehensive healthcare resource use data was available on the whole period of time have been analyzed. Comparisons of total costs have been conducted in patients continuously treated with BI on one, two or three years, in the National Sickness Fund perspective and after adjustment on the propension score method, established on initial characteristics of patients and their treatment, considering their healthcare resource use on the previous year as well.

Results

The analysed populations were characterized as the following:

Table 1: Number of patients starting Gla-300 or Gla-100 in the study period

T1D	Gla-300	Gla-100	Total
Patients initiating basal insulin	**2,140**	**4,532**	**6,672**
Patients with 1 full year of treatment	**1,789**	**3,002**	**4, 791**
Patients with 2 full years of treatment	**1,259**	**2,222**	**3,481**
Patients with 3 full years of treatment	**758**	**1,621**	**2,379**

T2D	Gla-300	Gla-100	Total
Patients initiating basal insulin	**60,357**	**175,537**	**235,854**
Patients with 1 full year of treatment	**46,420**	**129,689**	**176,109**
Patients with 2 full years of treatment	**26,742**	**79,622**	**106,364**
Patients with 3 full years of treatment	**13,041**	**47,360**	**60,401**

The patients characteristics were similar according to their treatment administered (Gla-100 or Gla-300) but they were often statistically significantly different in T1D patients as well as T2D patients, when initiating a treatment with BI.

Table 2: Patient characteristics at basal insulin initiation

T1D	Gla-300	Gla-100	Total	p-value
N	**2,140**	**4,532**	**6,672**	
Age at index date (T0)				0.0038
Mean (SD)	49.4 (19.2)	47.9 (18.9)	48.4 (19.0)	
Gender				0.2523
Male	1,235 (57.7%)	2,548 (56.2%)	3,783 (56.7%)	
History of diabetes				0.0048
Less than 10 years	799 (37.3%)	1 552 (34.2%)	2 351 (3.,2%)	
[10-20] years	625 (29.2%)	1 495 (33.0%)	2 120 (31.8%)	
20 years+	716 (33.5%)	1 485 (32.8%)	2 201 (33.0%)	
Social deprivation index (in quintiles)				0.0861
1	342 (16.0%)	835 (18.4%)	1,177 (17.6%)	
2	431 (20.1%)	856 (18.9%)	1,287 (19.3%)	
3	434 (20.3%)	956 (21.1%)	1,390 (20.8%)	
4	441 (20.6%)	908 (20.0%)	1,349 (20.2%)	
5	492 (23.0%)	977 (21.6%)	1,469 (22.0%)	
Charlson index				0.0033
0	1,195 (55.8%)	2,691 (59.4%)	3,886 (58.2%)	
1-2	735 (34.3%)	1,490 (32.9%)	2,225 (33.3%)	
3 et +	210 (9.8%)	351 (7.7%)	561 (8.4%)	
Mean (SD)	0.9 (1.4)	0.7 (1.2)	0.8 (1.3)	0.0012
CGM in the year previous to T0				
Yes	2,140 (100.0%)	4,532 (100.0%)	6,672 (100.0%)	-------
≥ 1 acute event in the 3 years previous to BI initiation				0.0178
Yes	239 (11.2%)	422 (9.3%)	661 (9.9%)	

T2D	Gla-300	Gla-100	Total	p-value
N	**60,357**	**175,537**	**235,894**	
Age at index date (T0)				<0.0001
Mean (SD)	65.6 (14.0)	69.1 (14.6)	68.2 (14.6)	
Gender				<0.0001
Male	34,143 (56.6%)	96,054 (54.7%)	130,197 (55.2%)	
History of diabetes				<0.0001
Less than 10 years	32,544 (53.9%)	96,396 (54.9%)	128,940 (54.7%)	
[10-20] years	21,191 (35.1%)	59,309 (33.8%)	80,500 (34.1%)	
20 years+	6,622 (11.0%)	19,832 (11.3%)	26,454 (11.2%)	
Social deprivation index (in quintiles)				<0.0001
1	7,244 (12.0%)	24,633 (14.0%)	31,877 (13.5%)	
2	10,136 (16.8%)	29,510 (16.8%)	39,646 (16.8%)	
3	11,967 (19.8%)	35,082 (20.0%)	47,049 (19.9%)	
4	14,151 (23.4%)	39,441 (22.5%)	53,592 (22.7%)	
5	16,859 (27.9%)	46,871 (26.7%)	63,730 (27.0%)	
Charlson index				<0.0001
0	23,345 (38.7%)	56,914 (32.4%)	80,259 (34.0%)	
1-2	20,881 (34.6%)	60,072 (34.2%)	80,953 (34.3%)	
3 et +	16,131 (26.7%)	58,551 (33.4%)	74,682 (31.7%)	
Mean (SD)	1.8 (2.2)	2.1 (2.4)	2.0 (2.4)	<0.0001
CGM in the year previous to T0				
Yes	24,367 (40.4%)	69,318 (39.5%)	93,685 (39.7%)	<0.0001
≥ 1 acute event in the 3 years previous to BI initiation				
Yes	2,415 (4.0%)	7,200 (4.1%)	9,615 (4.1%)	0.2814

Figure 1: Comparison of annual costs post-BI initiation (T1D)

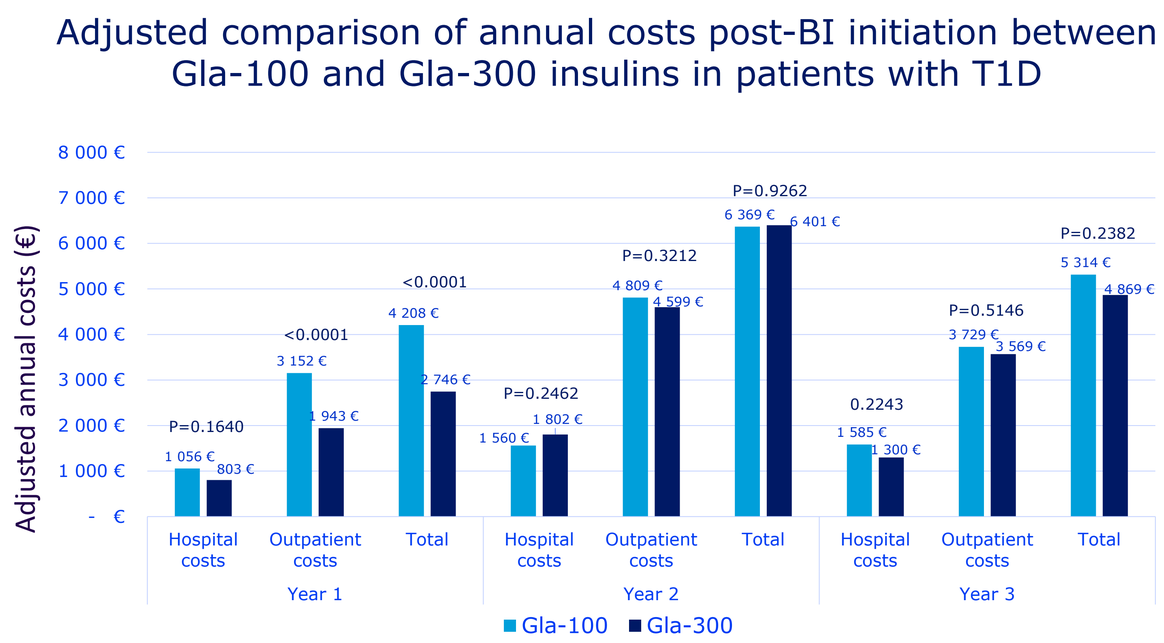
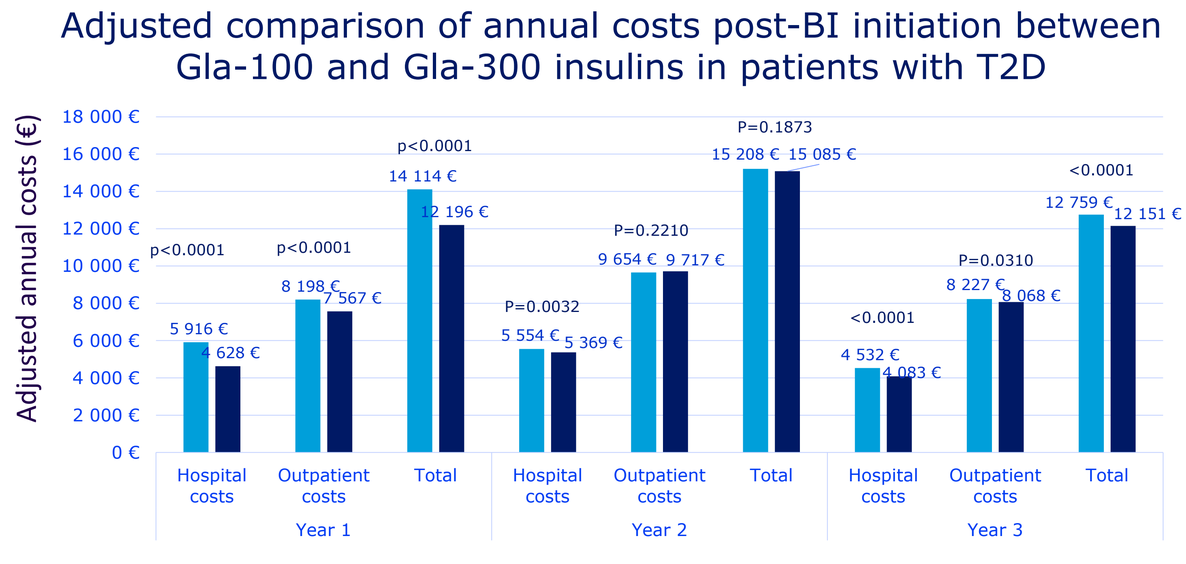


Figure 2: Comparison of annual costs post-BI initiation (T2D)



Comparisons of adjusted costs (hospital costs and outpatient costs) on the three years of follow-up after BI initiation, **show moderate but statistically significant results in favor of Gla-300 insulin compared to Gla-100 insulins,** for all patients living with diabetes, regardless of type 1 or type 2 the first year after BI initiation, and in the third year after that for T2D patients.

An extrapolation of these results for all French diabetic patients initiating Gla-100 over a 3-year period switching to Gla-300 would have resulted in a reduction of health expenditure by **€473 millions** for the National Sickness Fund only.

Conclusion

Comparisons of adjusted costs show a significant reduction of total direct healthcare costs with Gla-300 compared to Gla-100 during the whole 3 years of follow-up for T2D patients and on the first-year post BI initiation for T1D patients.

DISCLOSURES Corinne EMERY and Isabelle BUREAU are Cemka employees. Noémie ALLALI, Amar BAHLOUL and Aymeric Mahieu are Sanofi employees and may hold shares and/or stock options in the company. Bruno DETOURNAY has declared taking consulting fees or honoraria from Sanofi, Cemka, Novo Nordisk, Lill, BPI France and CERBA.

ISPOR Europe 2023
12-15 November 2023
Copenhagen, Denmark
#ISPOREurope

REFERENCES
[1] Detournay B, Boultif Z, Bahloul A, Jeanbat V, Robert J. Treatment Costs of Basal Insulin Regimens for Type 2 Diabetes Mellitus in France. Pharmacoecon Open. 2021 Jun;5(2):211-219. doi: 10.1007/s41669-020-00237-4. Epub 2020 Nov 20. PMID: 33215332; PMCID: PMC8160062.

CONTACT Noémie ALLALI noemie.allali@sanofi.com

This study was sponsored by Sanofi