The Clinical and Economic Impact of the Introduction of Emicizumab as Prophylactic Treatment for Hemophilia A Patients in Greece

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BACKGROUND

Emicizumab prophylaxis has been proven to be superior in reducing bleed rates when compared with factor VIII prophylaxis (non-inhibitor patients) or with bypassing agents (inhibitor patients). As such, making emicizumab available for patients eligible for this new type of prophylaxis is expected to have a substantial impact on the clinical and economic burden of disease caused by the bleedings experienced in this patient population and the short- and long-term consequences thereof.

OBJECTIVES

To evaluate the clinical and economic impact of the adoption of emicizumab as prophylactic treatment for patients in Greece with severe or moderate Hemophilia A (with or without inhibitors) and a severe bleeding phenotype.

METHODS

A treatment impact model was adapted to estimate the annual number of bleeds and associated direct medical costs over a 25-year horizon.

Two scenarios were compared:

- one in which emicizumab prophylaxis is not introduced on the market, during 25 years, treatment options solely consist of on-demand and prophylactic factor VIII for patients without inhibitors and on-demand and prophylactic bypassing agents for patients with inhibitors.
- one in which eligible patients have access to emicizumab: in this scenario, the market uptake of emicizumab is simulated by gradually switching patients from their conventional treatment towards emicizumab prophylaxis.

Annualized bleeding rates, hospitalization days, and utility values were sourced from international literature.

Local epidemiological data, provided by two Greek healthcare professionals, were used to estimate the eligible population (Table 1).

Unit costs (€2024) for bleed treatment (medication), arthroplasty, and hospitalization were derived as presented below (Table 2).

- The cost of a treated bleed was estimated as the average cost of medication per bleed (FVIII, rFVIIa, aPCC), calculated using drug acquisition prices[3,4], dosing schedules[2,5], patient weight[2], and treatment class utilization rates[2], plus the IV administration cost[6].
- The cost of arthroplasty was calculated by combining the DRG-based surgical cost[7,8], perioperative factor replacement (FVIII/rFVIIa/aPCC)[2,3,4], and post-surgery physiotherapy sessions reimbursed by EOPYY[9,10], adjusted for utilization and co-payment.
- The cost of a hospitalization day was derived from DRG tariffs divided by the average length of stay, weighted by the distribution of hospitalization types and age groups[2,6,7,8].

Emicizumab market share projections were provided by Roche[1]. Table 3 presents market shares at the start of the analysis (2021, before emicizumab introduction), the publication year (2025), and in the final year (2046), for both the non-inhibitor and inhibitor populations.

Table 1. Number of severe Haemophilia A patients and moderately severe patients with severe bleeding phenotype.

Number of Hemophilia A patients meeting the eligibility criteria for prophylactic treatment with emicizumab in Greece.	Percentage of patients	No of patients	Source
Patients with hemophilia A	100%	833	Roche [1]
% with factor VIII inhibitors	1.9%	16	HCPs [2]
% without factor VIII inhibitors	98.1%	817	HCPs [2]
% patients without factor VIII inhibitors, with severe disease (FVIII < 1%)	52.0%	433	HCPs [2]
% patients without factor VIII inhibitors, with moderate disease (FVIII ≥ 1% and ≤ 5%) with severe bleeding phenotype .	5.4%	45	HCPs [2]
Total number of severe Hemophilia A patients and moderately severe patients with severe bleeding phenotype (eligible population)		**494**	Calculation

Table 2. Direct medical cost inputs.

	Cost (€) for			
	Age Group (years)	Non - inhibitor patients	Inhibitor patients	Source
Cost of Treated Bleeds (medication)	Infants & Toddlers <2	2,383 €	2,717 €	HCPs[2]; Drug bulletin (MoH, Sept 2024)[3] Positive reimbursement list (MoH, Nov 2024)[4] Treatment Guidelines (MoH 2024)[5] Government gazette FEK B'2150/27-09-2011[6]
	Children 2 to <12	3,562 €	8,693 €	
	Adolescents 12 to <18	6,105 €	14,024 €	
	Adults 18 to <65	6,878 €	9,353 €	
	Elderly 65+	6,106 €	8,969 €	
Cost of Arthroplasty	Cost (€) per patient			Source
	32,199 €			HCPs[2] Drug bulletin (MoH, Sept 2024)[3]; Positive reimbursement list (MoH, Nov 2024)[4] Government gazette FEK B'7262/21-12-2023[7] - KE.TE.K.N.Y[8] EKPY 2018 Art. 39, ANNEX EKPY FEK 1318 B'/2019[9,10]
Cost of Hospitalisation days	Cost (€) per hospitalisation day			Source
	145 €			HCPs[2] Government gazette FEK B'2150/27-09-2011[6] Government gazette FEK B'7262/21-12-2023[7] KE.TE.K.N.Y[8]

Table 3. Market shares associated with emicizumab introduction from baseline year (2021) to 25-year horizon (2046).

Age group (years)	Year	MS of Non-inhibitor population: Prophylactic FVIII	On-Demand FVIII	Emicizumab	MS of Inhibitor population: Prophylactic FVIII	On-Demand FVIII	Emicizumab
Infants & Toddlers <2	2021	100.0%	0.0%	0.0%	20.0%	80.0%	0.0%
	2025	43.2%	0.0%	56.8%	0.0%	65.2%	34.8%
	2046	0.0%	0.0%	100.0%	0.0%	22.2%	77.8%
Children 2 to <12	2021	100.0%	0.0%	0.0%	20.0%	80.0%	0.0%
	2025	29.8%	0.0%	70.3%	0.0%	65.2%	34.8%
	2046	0.0%	0.0%	100.0%	0.0%	22.2%	77.8%
Adolescents 12 to <18	2021	80.0%	20.0%	0.0%	10.0%	90.0%	0.0%
	2025	50.0%	15.0%	34.9%	0.0%	73.3%	26.7%
	2046	0.1%	0.5%	99.4%	0.0%	25.0%	75.0%
Adults 18 to <65	2021	50.0%	50.0%	0.0%	5.0%	95.0%	0.0%
	2025	36.3%	36.3%	27.3%	0.1%	77.4%	22.5%
	2046	0.3%	0.3%	99.3%	0.0%	26.4%	73.6%
Elderly 65+	2021	50.0%	50.0%	0.0%	5.0%	95.0%	0.0%
	2025	36.3%	36.3%	27.3%	0.1%	77.4%	22.5%
	2046	0.3%	0.3%	99.3%	0.0%	26.4%	73.6%

RESULTS

The introduction of emicizumab in Greece was projected to substantially reduce the clinical and economic burden of Hemophilia A. Over a 25-year horizon, emicizumab was estimated to avert ~110,000 treated bleeds, prevent 175 arthroplasties, and reduce nearly 4,000 hospitalization days (Table 4).

These clinical benefits translated into a total reduction in direct medical costs of €736 million, with the majority of savings attributed to decreased pharmaceutical costs for bleed treatment (≈€730 million) (Table 5).

Specifically, the introduction of emicizumab was projected to avert 12 treated bleeds in the 1st year and up to 4,598 in the 25th year, resulting in pharmaceutical cost savings of €120,637 and €30,947,344 in the 1st and 25th year, respectively.

Table 4. Estimated numbers of treated bleeds, arthroplasties and hospitalizations with and without introduction of emicizumab during the 25-year period.

Numbers of	Absence of emicizumab (N)	Introduction of emicizumab (N)	Introduction of Emi vs. Absence of Emi (N)
Total Treated Bleeds	186,353	76,847	**109,506**
Total Arthroplasties	281	106	**175**
Total Hospitalisation days	11,030	7,089	**3,940**

Table 5. Estimated direct medical costs with and without introduction of emicizumab during the 25-year period.

Direct costs per	Absence of emicizumab (€)	Introduction of emicizumab (€)	Introduction of Emi vs. Absence of Emi (€)
Total Treated Bleeds	1,243,348,694 €	513,598,288 €	**729,750,406 €**
Total Arthroplasties	9,051,996 €	3,407,590 €	**5,644,406 €**
Total Hospitalisation days	1,602,387 €	1,029,929 €	**572,458 €**
Total Direct medical Costs	1,254,003,078 €	518,035,808 €	**735,967,270 €**

CONCLUSIONS

Emicizumab's long-term adoption is expected to generate meaningful clinical improvements and substantial economic value for the Greek healthcare system. With an 86% projected reduction in direct medical costs by 2046, emicizumab represents a high-value investment for public health funding in Hemophilia A management.

References

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