Budget impact analysis of Faricimab for treating patients with Diabetes Macular Edema or Neovascular Age-Related Macular Degeneration in Costa Rica

EE419

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Introduction

Diabetic macular edema (DME) and neovascular age-related macular degeneration (nAMD) are severe eye conditions that can cause irreversible vision loss if left untreated [1,2]. In Costa Rica, these conditions affect a significant portion of the population, and the current treatment options can be costly and burdensome. Faricimab is a newly approved treatment that offers a more convenient dosing schedule and has shown promising results in clinical trials [3-5]. Therefore, it is essential to assess the potential budget impact of integrating faricimab into the healthcare system of Costa Rica to ensure that patients have access to the best possible care.

The purpose of this study is to present the results of a budget impact analysis (BIA) conducted on using faricimab to treat patients with DME and nAMD in Costa Rica. In addition, the study aimed to evaluate the potential economic impact of integrating this new treatment option into the healthcare system of Costa Rica. The findings of this BIA can provide valuable insights into the potential financial implications of introducing faricimab as a new treatment option for these debilitating eye conditions in Costa Rica.

Methods

This BIA aims to assess the financial impact of introducing faricimab for patients with DME or nAMD in Costa Rica. The BIA estimated the number of patients currently suffering from DME in Costa Rica based on the following variables: distribution of the population aged 18-64 and > 65 years [4], prevalence of diabetes in each age group, prevalence of DME in patients in diabetic patients, proportion of patients with DME diagnosed, and patients eligible for anti-vascular endothelial growth factor (anti-VEGF) therapy. Based on the above, the model estimated that by 2023 there would be 12 232 DME patients eligible for treatment with faricimab, of which 48 % the model assumed to have bilateral disease. The annual growth of new patients with DME who will need therapy is 6.4 %.

In the case of nAMD, the model considered the following variables to estimate the number of patients who currently have the disease: population > 50 years [4], the proportion of patients who probably have nAMD, the ratio of patients diagnosed, and patients who are candidates for anti-VEGF therapy. Based on the above, the model estimated that there are 1 234 patients with nAMD eligible for faricimab treatment by 2023, with 36 % assumed to have bilateral disease. In addition, the annual growth of new patients needing therapy is 11 %.

Table 1 shows the number of patients and the number of eyes eligible to receive faricimab between 2023 and 2026 in patients with DME and nAMD in Costa Rica. The market share assumed by the model in 2023 is that no patients are receiving faricimab, 80 %, bevacizumab; 15 %, ranibizumab, and 5 %, aflibercept. Furthermore, the model assumes that faricimab's market share will grow by 3 % per year between 2024 and 2026 at the expense of the bevacizumab market. The perspective of the analysis is from the third-party payer, and the costs are in USD 2022.

Results

Table 3 shows the number of patients per comparator who would receive treatment for DME in Costa Rica in the current scenario without faricimab and in the plan with faricimab. Likewise, Table 4 has the same results for patients with nAMD. The budgetary impact of including 3 % of patients with DME and nAMD in Costa Rica each year generates a saving of $ 1,145,505 to the country's health system in just three years (Fig. 1). This saving would be $ 188,774 in the first year, $ 380,802 in the second year, and $ 575,929 in the third year. As the number of patients receiving treatment with faricimab increases, there is a more significant saving for the health system.

Table 1. The number of patients and eyes with DME or nAMD candidates for anti-VEGF treatment in Costa Rica between 2023 and 2026.

Year	DME		nAMD	
	# of patients	# of eyes	# of patients	# of eyes
2023	12,232	18,104	1,234	1,679
2024	12,342	18,266	1,246	1,694
2025	12,449	18,424	1,256	1,708
2026	12,552	18,576	1,267	1,723

Table 2. The number of anti-VEGF injections in the first year and from the second year, and the drug dose in each injection in patients with DME / nAMD.

Anti-VEFG Therapy	Dose per injection (mg)	# of injections per year			
		DME		nAMD	
		Year 1	Year 2+	Year 1	Year 2+
Faricimab	6.00	8.4	4.9	6.79	4.69
Aflibercept	2.00	9.4	5.0	8.00	5.63
Bevacizumab	1.25	9.9	5.5	10.06	8.44
Ranibizumab	0.50	9.5	5.4	9.13	7.14

Table 2 shows the dose per injection (mg) and the number of annual injections of faricimab and anti-VEGFG comparators for DME and nAMD, based on those reported by faricimab clinical trials [1-3] and a meta-analysis of anti-VEGF [5]. In addition, the BIA compares the total costs over three years between the introduction of faricimab.

Table 3. The number of patients per comparator who would receive treatment for DME in Costa Rica in a scenario without faricimab and in a plan with faricimab.

	The base year (2023)	2024	2025	2026
	Scenario without Faricimab			
Faricimab	0	0	0	0
Aflibercept	612	617	622	628
Bevacizumab	9,786	9,874	9,959	10,041
Ranibizumab	1,835	1,851	1,867	1,883
Total	12,232	12,342	12,449	12,552
	Scenario with Faricimab			
Faricimab	0	370	747	1,130
Aflibercept	612	617	622	628
Bevacizumab	9,786	9,503	9,212	10,041
Ranibizumab	1,835	1,851	1,867	1,883
Total	12,232	12,342	12,449	12,552

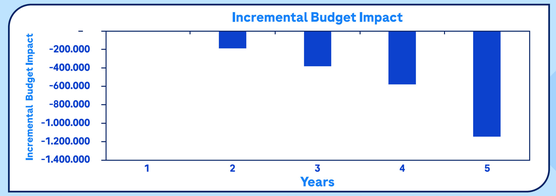

Figure 1. The incremental budget impact of faricimab for treating DME and nAMD in Costa Rica, with a market share that increases by 3% each year for faricimab.

Table 4. The number of patients per comparator who would receive treatment for nAMD in Costa Rica in a scenario without faricimab and in a plan with faricimab.

	The base year (2023)	2024	2025	2026
	Scenario without Faricimab			
Faricimab	0	0	0	0
Aflibercept	62	62	63	63
Bevacizumab	988	996	1,005	1,013
Ranibizumab	185	187	188	190
Total	1,234	1,246	1,256	1,267
	Scenario with Faricimab			
Faricimab	0	37	75	114
Aflibercept	62	62	63	63
Bevacizumab	988	959	930	899
Ranibizumab	185	187	188	190
Total	1,234	1,246	1,256	1,267

Discussion

Including faricimab in treating DME and nAMD in Costa Rica would save $ 1,145,505 for the country's health system in just three years, with a market share in which the proportion of patients receiving faricimab increases by 3 % each year. After three years, this 9 % market share would be 1 244 patients out of the almost 14 000 who would need to receive treatment for DME and nAMD in Costa Rica by 2026. This saving occurs because faricimab requires fewer doses than its comparators (Table 2), which avoids the expenses generated by the administration of the medication in an operating room, as well as the transfer of patients by ambulance to the hospital when they come from remote areas (approximately 30 % of patients).

Likewise, the growth of faricimab's market share would come at the expense of only bevacizumab, a drug used off-label in these patients. Intravitreal bevacizumab is applied in Costa Rica despite a safety alert issued by the National Pharmacovigilance Center in March 2015, warning that bevacizumab should only be used for approved indications in the country [8].

The main weakness of this economic model is that it does not estimate the costs of adverse events related to bevacizumab, as the model assumes that they do not exist. However, subconjunctival hemorrhages, vitreous hemorrhages, and endophthalmitis, among others, have been described [9]. The main strength of this economic model is that a group of expert retinal ophthalmologists who attend to patients with DME and nAMD in Costa Rica estimated the cost of healthcare resources.

Conclusion

The inclusion of faricimab for the treatment of DME and nAMD in Costa Rica, at the expense of bevacizumab's market share, generates savings for the country's health system because fewer doses are needed, and it avoids the costs of operating rooms and ambulance transportation related to the application of these medications.

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