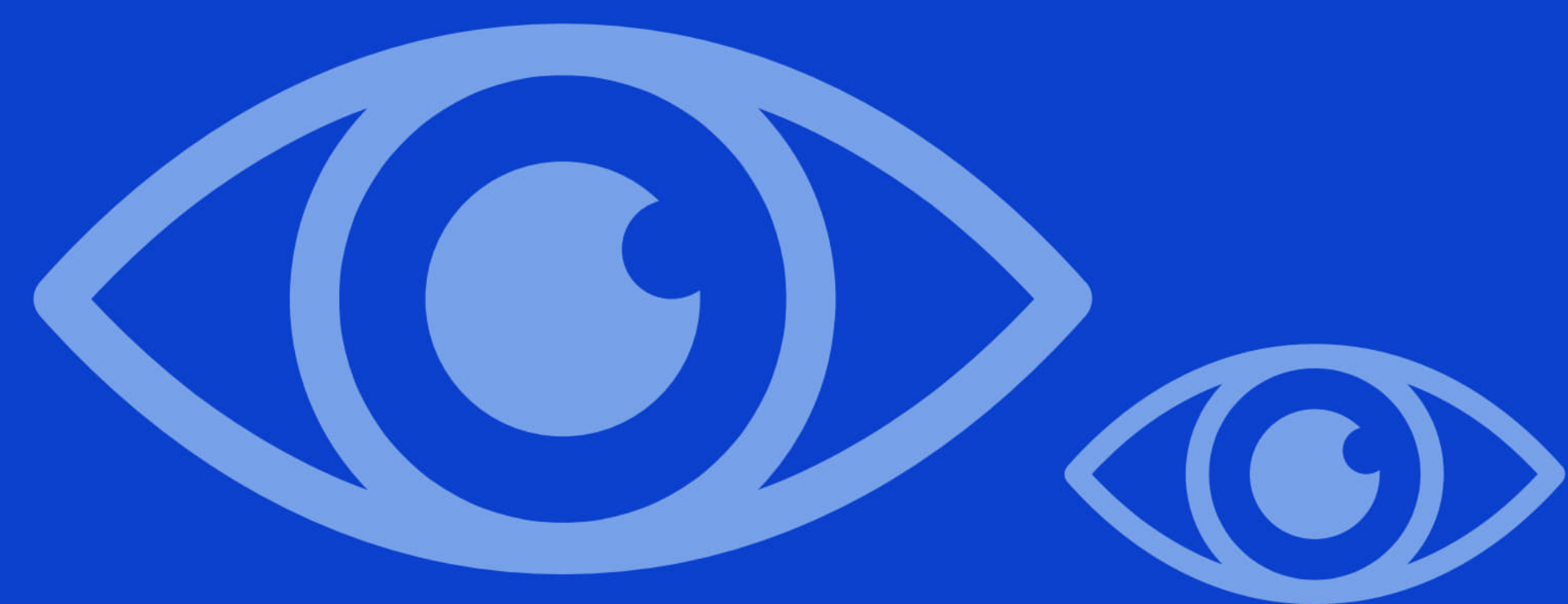




The burden of disease of Diabetic Macular Edema and Neovascular Age-Related Macular Degeneration in Panama



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Introduction

Diabetic macular edema (DME) and neovascular age-related macular degeneration (nAMD) are two significant causes of vision loss and blindness worldwide [1,2]. In Panama, the prevalence of these diseases is a growing concern as the population ages and the incidence of diabetes increases [3]. Furthermore, the socioeconomic consequences of these diseases are significant, affecting individuals during their productive years, leading to a decrease in quality of life, loss of employment opportunities, and increased healthcare costs. Therefore, understanding the burden of DME and nAMD on the population's health in Panama is crucial for developing effective prevention and treatment strategies. This poster aims to raise awareness of the burden of DME and nAMD in Panama by providing an overview of the healthcare resources in these patients and their economic impact. In addition, by presenting the latest research findings and data, the poster intends to highlight the importance of management strategies to mitigate the disease's impact on the population's health. The study will also emphasize the need for public health policies and initiatives to raise awareness of the disease burden, improve access to healthcare services, and support ongoing research efforts to develop new therapies and interventions.

Methods

The burden of DME and nAMD study in Panama employed a cross-sectional survey design. The study aimed to identify healthcare resources and costs associated with managing DME and nAMD in the country. Ophthalmologists and retinologists practitioners were interviewed in Panama to gather data. The study began with a list of all ophthalmologists and retinologists practitioners in Panama from the College of Physicians. Opinion leaders were identified from this list and invited to participate in the study. Informed consent was obtained from each participant before conducting the interviews. The interviews were completed using a structured questionnaire developed by the research team. The questionnaire included the generalities of DME and nAMD patients the participants saw, the type of healthcare resources required for managing these conditions (e.g., drugs, equipment, and personnel), and the associated costs. The data collected from the interviews was analyzed using descriptive statistics to determine the prevalence of DME and nAMD, healthcare resources utilized, and related expenses. The study adhered to ethical guidelines for research involving human subjects and maintained confidentiality for the participants and collected data. The study aims to inform policymakers, healthcare providers, and other stakeholders about the burden of DME and nAMD in Panama and the resources required to manage these conditions effectively. In addition, the study's findings are expected to contribute to developing prevention and management strategies that can alleviate the burden of these diseases on the population's health.

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Results

The study results were adjusted for both the public and private sectors, considering direct and indirect costs, including patient-caregiver expenses and loss of productivity due to vision loss. Table 1 outlines the healthcare resources utilized for treating patients with DME, while Table 2 shows the healthcare resources required for treating patients with nAMD in Panama. Adjusted for direct and indirect costs, Table 3 presents the healthcare expenses associated with patients suffering from DME and nAMD in Panama. The costs were analyzed based on the type of health system, whether public or private. In addition, indirect fees, including patient-caregiver expenses and lost productivity, were also accounted for.

Table 1. Health care resources used in Panama in patients with DME, 2022.

Healthcare resource	Private health system		Public health system	
	Probability of use	Annual frequency of use	Probability of use	Annual frequency of use
Patient-caregiver	100%	Full time	100%	Full time
Lost productivity	50%	Half time	50%	Half time
OCT Scans	100%	6	100%	5
Fluorescein angiography	100%	6	30%	5
Outpatient visits	100%	11	100%	6
Laser	0%	0	100%	6
Intravitreal triamcinolone acetonide (IVTA)	0%	0	30%	2
Topical diclofenac	0%	0	70%	12 months
Intravitreal bevacizumab (IVB) (+ laser)	80%	6	0%	0
Intravitreal ranibizumab injection (+laser)	15%	6	0%	0
Intravitreal aflibercept injection (IAI) (+ laser)	5%	6	0%	0

Table 2. Health care resources used in Panama in patients with nAMD, 2022.

Healthcare resource	Private health system		Public health system	
	Probability of use	Annual frequency of use	Probability of use	Annual frequency of use
Patient-caregiver	100%	Full time	100%	Full time
Lost productivity	50%	Half time	50%	Half time
OCT Scans	100%	5	100%	5
Fluorescein angiography	100%	5	100%	5
Outpatient visits	100%	5	100%	11
Laser	0%	0	100%	5
Intravitreal bevacizumab (IVB) (+ laser)	80%	5	0%	0
Intravitreal ranibizumab injection (+laser)	15%	5	0%	0
Intravitreal aflibercept injection (IAI) (+ laser)	5%	5	0%	0

Table 3. Health care costs of patients with DME and nAMD in Panama, adjusted for the type of health system and the type of costs, 2022.

Item	EMD	nAMD	EMD costs	nAMD costs
Public health system	15%	15%	\$ 14,532	\$ 13,960
Private health system	85%	85%	\$ 19,465	\$ 16,698
Weighted average (total)			\$ 18,725	\$ 16,288
Indirect costs	67%	77%	\$ 12,522	\$ 12,522
Direct costs	33%	23%	\$ 6,203	\$ 3,766

Discussion

The healthcare average costs for patients with DME in Panama is \$ 16,288, while those for nAMD are \$ 18,725. Notably, the drug used for treatment is bevacizumab, designed for intravenous rather than intravitreal administration. However, despite a warning issued by the National Direction of Pharmacy and Drugs in April 2013, where bevacizumab is not approved for use in DME, it is still being used intravitreally in Panama in the private sector, while in the public one the laser strategy is unique. Besides, Bevacizumab can cause necrotizing fasciitis [4]. Furthermore, bevacizumab is not registered for intravitreal use and is therefore used off-label. Zehden et al. recently reviewed ocular adverse events (AEs) associated with intravitreal anti-vascular endothelial growth factor (anti-VEGF) agents, including bevacizumab. Common AEs include subconjunctival hemorrhage (7 % - 19 %), vitreous hemorrhage (0.8 % - 4 %), endophthalmitis (0.016 % - 0.16 %), uveitis/sterile inflammation (0.09 % - 14.6 %), increased intraocular pressure (0.16%), and rhegmatogenous retinal detachment (0.0084 % - 0.013 %) [5]. The PACORE study, which occurred in Latin America between 2005 and 2006, also reported a range of AEs related to intravitreal bevacizumab [6]. Also the public option of “laser” is not an actual recommendation strategy for the treatment of these diseases. The main weakness of this study is that it did not estimate the healthcare costs associated with anti-VEGF AEs therapy application and blindness sequels such as hip-replacement. Therefore, we recommend that future studies estimate the healthcare costs of AEs related to anti-VEGF agents because care for these AEs is part of the disease burden of AMD and nAMD.

Conclusion

The disease burden of health care for patients with DME and nAMD in Panama fluctuates between \$ 16,300 and \$ 18,700 annually, not including the costs of care for AEs related to the application of intravitreal bevacizumab, nor blindness sequels.

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