

OVERDIAGNOSIS AND OVERTREATMENT IN GLAUCOMA



Results from the Thessaloniki Eye Study highlight this important issue.

BY ELEFThERIOS ANASTASOPOULOS, MD, PHD, AND FOTIS TOPOUZIS, MD, PHD

Glaucoma is one of the leading causes of irreversible blindness worldwide.¹ Accurate diagnosis can be challenging not only for general ophthalmologists but also for glaucoma experts because of the insidious nature of the disease and high variability in the appearance of the optic disc among healthy and glaucomatous eyes.

The problem of undiagnosed and untreated glaucoma has been reported in many epidemiologic studies, with some concluding that more than half of the cases of glaucoma were undiagnosed.²⁻⁵ On the other hand, data on the overdiagnosis and overtreatment of glaucoma are limited, despite its potential to cause serious consequences for individuals. Overdiagnosis and overtreatment have recently been recognized as an important health issue in many fields of medicine.^{6,7}

An overdiagnosed disease will not cause significant symptoms during the individual's lifetime if left untreated. On the contrary, treatment and follow-up could cause damage and carry an economic burden without clearly benefitting the person. Overdiagnosis usually involves chronic diseases that

"AN OVERDIAGNOSED DISEASE WILL NOT CAUSE SIGNIFICANT SYMPTOMS DURING THE INDIVIDUAL'S LIFETIME IF LEFT UNTREATED. ON THE CONTRARY, TREATMENT AND FOLLOW-UP COULD CAUSE DAMAGE AND CARRY AN ECONOMIC BURDEN WITHOUT CLEARLY BENEFITTING THE PERSON."

progress slowly.⁶ A broader definition of the term includes diagnostic errors or false positives. Overdiagnosis turns people into patients unnecessarily, causes anxiety, and increases diagnostic costs for hospitals and the waiting time for new appointments.

Overdiagnosis usually leads to overtreatment, which, in turn, can cause unnecessary drug-related side effects, increase the economic burden on individuals and societies, and negatively affect the environment in the form of wasted clinical resources.

FINDINGS FROM THE THESSALONIKI EYE STUDY

The Thessaloniki Eye Study (TES) is an epidemiologic study of major eye

diseases in people over 60 years of age in Thessaloniki, Greece. TES is the only population-based study to date that has reported the rates of both underdiagnosed and overdiagnosed open-angle glaucoma (OAG).

The prevalence of under- and overdiagnosis. The prevalence of undiagnosed OAG in the TES was greater than 50%.³ Approximately 2% of the study participants self-reported glaucoma (ie, reported either a prior diagnosis of glaucoma or a history of laser or surgical treatment for the disease). Sixty percent of these previous glaucoma diagnoses had not been confirmed with a thorough examination.⁸ When individuals with a history of high IOP and/or treatment for high

IOP were included in the definition of self-reported glaucoma, the estimated prevalence of overdiagnosed OAG in the overall general population of Thessaloniki increased to 5.5%. This number is similar to the prevalence of OAG in the same population. In other words, based on the results of the TES, there is a false-positive case of glaucoma for every true case of glaucoma in Thessaloniki.

Risk factors for overdiagnosis and overtreatment. In the TES, a family history of glaucoma and a history of cataract surgery were both associated with a sevenfold greater odds ratio for glaucoma overdiagnosis.⁸ Family history is a well-known risk factor for glaucoma. The findings of the TES, however, suggest that this parameter often may be used improperly as a diagnostic criterion for glaucoma or trigger a false-positive diagnosis.

A history of cataract surgery is correlated with postoperative IOP spikes and/or an increased number of visits to an eye care provider. For these reasons, a history of cataract surgery may also be associated with glaucoma overdiagnosis.

IMPLICATIONS

The relatively high prevalence of OAG overdiagnosis found in the TES may suggest that a similar problem exists in other countries, but supporting data are lacking. The prevalence of underdiagnosis in the TES, however, is in line with that reported by other major population-based studies conducted around the world.²⁻⁵

Possible reasons for the high prevalence of overdiagnosis found in the TES include the complexity of diagnosing glaucoma in many cases, a lack of expertise among some eye care providers, concerns about legal liability among general ophthalmologists, the use of increasingly sensitive technologies (ie, OCT and OCT angiography), overtesting, and pressure from industry.

CONCLUSION

Data on the overdiagnosis and overtreatment of OAG are limited, but the prevalence was high in the TES. When it comes to glaucoma management, doing more is not necessarily better. Eye care providers must carefully consider which patients are likely to benefit from treatment and which are likely better served by observation. ■

1. Quigley HA, Broman AT. The number of people with glaucoma worldwide in 2010 and 2020. *Br J Ophthalmol*. 2006;90(3):262-267.
2. Shaikh Y, Yu F, Coleman AL. Burden of undetected and untreated glaucoma in the United States. *Am J Ophthalmol*. 2014;158(6):1121-1129.e1.
3. Topouzis F, Coleman AL, Harris A, et al. Factors associated with undiagnosed open-angle glaucoma: the Thessaloniki Eye Study. *Am J Ophthalmol*. 2008;145(2):327-335.
4. Chua J, Baskaran M, Ong PG, et al. Prevalence, risk factors, and visual features of undiagnosed glaucoma: The Singapore Epidemiology of Eye Diseases Study. *JAMA Ophthalmol*. 2015;133(8):938-946.
5. Heijl A, Bengtsson B, Oskarsdottir SE. Prevalence and severity of undetected manifest glaucoma: results from the early manifest glaucoma trial screening. *Ophthalmology*. 2013;120(8):1541-1545.
6. Brodersen J, Kramer BS, Macdonald H, Schwartz LM, Woloshin S. Focusing on overdiagnosis as a driver of too much medicine. *BMJ*. 2018;362:k3494.
7. González-Martin-Moro J, Zarallo-Gallardo J. Over-diagnosis and over-treatment in ophthalmology: a review of the literature. *Arch Soc Esp Otol*. 2016;91(11):526-534.
8. Founti P, Coleman AL, Wilson MR, et al. Overdiagnosis of open-angle glaucoma in the general population: the Thessaloniki Eye Study. *Acta Ophthalmol*. 2018;96(7):e859-e864.

ELEFTHERIOS ANASTASOPOULOS, MD, PHD

- Second Department of Ophthalmology, General Hospital Papageorgiou, Aristotle University of Thessaloniki, Greece
- terisan@med.auth.gr
- Financial disclosure: None

FOTIS TOPOUZIS, MD, PHD

- First Department of Ophthalmology, AHEPA General Hospital, Aristotle University of Thessaloniki, Greece
- ftoupozis@otenet.gr
- Financial disclosure: None