



Methodological letter

Overdiagnosis and overtreatment — More is better?

Sobrediagnóstico (overdiagnosis) y sobretratamiento (overtreatment). ¿Más es mejor?

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Nearly 20 years ago, Ray Moynihan published an editorial in the *British Medical Journal* titled “Too much medicine”, in which he questioned whether certain healthcare systems and doctors were really overtreating the healthy or sick population.¹

Overdiagnosis is defined as the diagnosis of a condition that, if left undetected, would not have caused symptoms or the death of the individual.² We could also say that overdiagnosis is the phenomenon that occurs when people are diagnosed with diseases that would never cause symptoms or shorten their life expectancy. However, the mere diagnosis of the condition may cause fear in patients and their families, can lead to aggressive treatments, and ultimately may become a problem at the population level.³

The concept of overdiagnosis is counterintuitive for health professionals and for the general population as well, mainly because of the simplistic and widespread idea that, “the sooner it is detected, the better”. Thus, administering a screening test seems to be a very sensible thing to do because an early diagnosis can be better. But this is not always true.

In the field of surgery, some diagnoses (mainly tumors) can be associated with the phenomena of overdiagnosis and overtreatment. Surgeons, like other health professionals, may support screening strategies to make an early cancer diagnosis. In other words, the disease is detected before it manifests itself clinically, and it is assumed that the treatment will achieve a better result or that the surgical procedure should be less extensive and/or aggressive.

However, the progression of the lesion is influenced by the organ, the tissue in which it originates and the biology of the

tumor. Studies based on autopsy results have shown that some individuals have died from other causes without ever having observed any clinical manifestation of the tumor. This confirms that there is a reservoir of subclinical tumors.⁴ Surgical management of these patients, either with or without other pharmacological treatments, could have caused unnecessary damage to the individual.

It has been demonstrated that screening for certain pathologies has no benefit, while in other cases the benefit is doubtful.⁵ In the specific case of tumor pathology, screening may be beneficial in slow-progressing lesions, but not in those with rapid growth. A common error in assessing the benefits of screening is due to lead-time bias.⁶ In other words, the observed survival seems longer because the diagnosis was made earlier. In cases with no screening or ineffective screening, death occurs at the same time, but survival seems higher in patients who have undergone screening because their date of diagnosis is earlier.

An equally relevant concept is that of incidentalomas. This term is used to refer to a completely asymptomatic mass or lesion that is discovered by chance in an asymptomatic patient due to the common use of diagnostic imaging techniques.⁴

Prostate cancer

Studies based on the post-mortem analysis of men who had died from different causes confirm that prostate cancer is

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present in a very significant percentage. The ascending prevalence reaches 59% in those over the age of 79. However, in OECD⁷ countries as a whole, this condition is associated with only 2.3% male mortality.

We must again remember that prostate cancer treatment can lead to significant associated damage, such as incontinence and sexual impotence. What is more, regardless of the impact of the treatment (which can be aggressive), the diagnosis alone significantly impacts patients, as shown by a study using qualitative research methodology.⁸ Therefore, it is necessary to introduce measures to reduce overdiagnosis in this pathology.

Thyroid cancer

The incidence of thyroid cancer has tripled in the last 40 years in the US,⁹ which seems fundamentally due to the introduction of new diagnostic techniques, such as ultrasound.¹⁰ Thyroid cancer is more common in young people and, as in other examples mentioned, it has a notable biological reservoir, mainly in its papillary variant, which is relatively non-aggressive.¹¹ Overdiagnosis has been studied at individual hospitals, and relevant results have been reported on its impact.¹² However, in certain Asian countries like South Korea, thyroidectomies associated with thyroid cancer have increased exponentially due to various government policies and health insurers. Even so, the specific mortality for this pathology has not decreased.⁹

Presently, there is even talk of a 'thyroid cancer epidemic', as its expansion has occurred in both rich and developing countries.¹³

As they say, the first step to solve any problem is to acknowledge that there is a problem, which is currently being reflected in the literature with an increase in articles discussing overdiagnosis and overtreatment. For now, strategies that may help reduce this excess of medicine include greater information and awareness of professionals and patients, promotion of compliance with clinical practice guidelines based on higher quality evidence, addressing these diagnoses in multidisciplinary groups, and perhaps also influencing certain social values through the media.⁹

As Carter et al.¹⁴ conclude in one of their studies, in order to more precisely define, better understand, and respond proportionately to the epidemic of overdiagnosis, it is necessary to understand how the framework of the healthcare system works, including the thought process of medical professionals and the vision of the citizens who trust them. The phenomenon of overdiagnosis is expected to continue until physicians, patients, and society in general learn to

discuss and accept the inherent uncertainties of clinical practice.

REFERENCES

1. Moynihan R, Smith R. Too much medicine? *BMJ*. 2002;324:859-60. <http://dx.doi.org/10.1136/bmj.324.7342.859>.
2. Welch HG, Fisher ES. Income and cancer overdiagnosis - when too much care is harmful. *N Engl J Med*. 2017;376:2208-9. <http://dx.doi.org/10.1056/NEJMp1615069>.
3. Heneghan C, Mahtani KR. Is it time to end general health checks? *BMJ Evid Based Med*. 2020;25:115-6. <http://dx.doi.org/10.1136/bmjebm-2019-111227>.
4. Marzo-Castillejo M, Vela-Vallespin C. Sobrediagnóstico en cáncer. *Aten Primaria*. 2018;50:51-6.
5. Robra BP. Harms and benefits of cancer screening. *Recent Results Cancer Res*. 2021;218:85-104. http://dx.doi.org/10.1007/978-3-030-63749-1_7.
6. Yang SC, Wang JD, Wang SY. Considering lead-time bias in evaluating the effectiveness of lung cancer screening with real-world data. *Sci Rep*. 2021;11:12180. <http://dx.doi.org/10.1038/s41598-021-91852-6>.
7. Bell KJ, Del Mar C, Wright G, Dickinson J, Glasziou P. Prevalence of incidental prostate cancer: a systematic review of autopsy studies. *Int J Cancer*. 2015;137:1749-57. <http://dx.doi.org/10.1002/ijc.29538>.
8. McCaffery K, Nickel B, Pickles K, Moynihan R, Kramer B, Barratt A, et al. Resisting recommended treatment for prostate cancer: a qualitative analysis of the lived experience of possible overdiagnosis. *BMJ Open*. 2019;9:e026960. <http://dx.doi.org/10.1136/bmjopen-2018-026960>.
9. Jensen CB, Saucke MC, Francis DO, Voils CI, Pitt SC. From overdiagnosis to overtreatment of low-risk thyroid cancer: a thematic analysis of attitudes and beliefs of endocrinologists, surgeons, and patients. *Thyroid*. 2020;30:696-703. <http://dx.doi.org/10.1089/thy.2019.0587>.
10. Varela J. Overdiagnosis: realities and perspectives. *Med Clin (Barc)*. 2017;148:118-20. <http://dx.doi.org/10.1016/j.medcli.2016.10.011>.
11. Welch HG, Doherty GM. Saving thyroids - overtreatment of small papillary cancers. *N Engl J Med*. 2018;379:310-2. <http://dx.doi.org/10.1056/NEJMp1804426.PMID:30044933>.
12. Solis-Pazmino P, Salazar-Vega J, Lincango-Naranjo E, Garcia C, Koupermann GJ, Ortiz-Prado E, et al. Thyroid cancer overdiagnosis and overtreatment: a cross-sectional study at a thyroid cancer referral center in Ecuador. *BMC Cancer*. 2021;21:42. <http://dx.doi.org/10.1186/s12885-020-07735-y>.
13. Lortet-Tieulent J, Franceschi S, Dal Maso L, Vaccarella S. Thyroid cancer "epidemic" also occurs in low- and middle-income countries. *Int J Cancer*. 2019;144:2082-7. <http://dx.doi.org/10.1002/ijc.31884>.
14. Carter SM, Rogers W, Heath I, Degeling C, Doust J, Barratt A. The challenge of overdiagnosis begins with its definition. *BMJ*. 2015;350:h869. <http://dx.doi.org/10.1136/bmj.h869>.