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Review Article

Rapid Health Technology Assessment of Oncotype DX in Patients with Early-Stage Breast Cancer

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Not Applicable

Abstract

Introduction: Breast cancer is the most common cancer in women. Patients are treated with chemotherapy initially, and if not chemically treated, the risk of recurrence of the disease increases yearly. Therefore, methods for identifying patients for whom chemotherapy would be most beneficial are very important. The Oncotype DX test is a prognostic assay that predicts the likelihood of breast cancer recurrence as well as the effectiveness of chemotherapy. Because of the novelty and the high cost of this test, the current study aims to determine its effectiveness and economic effects.

Methods: This study, based on rapid health technology assessment, explored the effectiveness and economic consequences of Oncotype DX compared with alternative methods in breast cancer patients. PubMed, Scopus, Web of Science, and Cochrane databases were searched, and only studies about the use of the Oncotype DX test in breast cancer were included.

Results: The results of the 32 relevant studies showed that the difference in outcomes was negligible across Oncotype DX and other gene expression profiling tests, but these differences were significant compared with standard treatment. Also, Oncotype DX testing would be cost-saving when used for patients under chemotherapy. However, using this test for all patients may not be cost-saving depending on the number of patients who switch from hormone therapy to chemotherapy and vice versa.

Conclusion: Although the results of this study are helpful for policymakers and therapists, it is better to make decisions based on the results of effectiveness and cost in Iran.

Keywords: Breast Cancer, Oncotype DX, Rapid Health Technology Assessmentv

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Introduction

Breast cancer is the most common malignancy in females and the second leading cause of mortality due to cancer over the world (1). Over the past decades, the survival rate of breast cancer patients has increased dramatically due to increased patient awareness and early screening as well as adjuvant therapy (2). The use of adjuvant chemotherapy in early-stage breast cancer patients who are estrogen receptor (ER)-positive has reduced breast cancer–related mortality (3) as well as the economic burden on the health system. However, the benefit of adjuvant chemotherapy is not equal for all patients (4). Thus, identifying and selecting the patients who would benefit most from chemotherapy is essential to reducing unnecessary services, cytotoxic therapies, and related side effects (3). In the past 10 years, new assays have been developed to identify patients with a low risk of recurrence for whom chemotherapy leads to toxicity without a clinically meaningful benefit (5). One of those assays, which is based on gene expression profiling, is Oncotype DX. This study aims to evaluate the effectiveness and economic aspects of Oncotype DX to show its strengths and weaknesses.

Methods

This study, based on rapid health technology assessment, reviewed the use of Oncotype DX in early-stage breast cancer compared with alternative methods in terms of effectiveness and economic consequences. We searched PubMed, Scopus, Web of Science, and Cochrane databases for articles published before December 2018. The search strategy was applied and articles were screened for relevance based on the title and abstract, and remaining full-text articles were screened based on the inclusion criteria. Studies that reported on both effectiveness and cost aspects of the Oncotype DX test in breast cancer were included.

Results

Thirty-two articles were included in this study (Figure 1). The effectiveness of Oncotype DX was measured using different criteria, including change in the treatment regimen, survival and life expectancy, and the quality-adjusted life years (QALY). The economic evaluation of studies has been reported in terms of unit price, treatment costs, change in treatment costs, and the incremental cost-effectiveness ratio (ICER). Studies comparing Oncotype DX with other tests were limited, and most of them compared Oncotype DX with standard treatment (lack of gene expression tests).

Discussion

In general, the use of Oncotype DX has led to a significant difference in the treatment regimen (about 20% to 30%). Most of these changes are seen in low-risk groups, where the test has led to a reduction in the rate of chemotherapy. On the other hand, Oncotype DX testing has contributed to increased administration of chemotherapy in high-risk groups. Overall, in terms of effectiveness, little difference was reported in the effectiveness of the Oncotype DX test when compared with other gene expression profiling tests, although the results of these tests may have been different in chemotherapy or hormone therapy groups. Overall, the difference between the test results was insignificant, but compared with standard care (without test), these differences have been significant. Regarding economic evaluation, the Oncotype DX test has not been cost-effective in any study compared with other tests. Studies have also shown that Oncotype DX is likely to reduce costs if applied only to people on a chemotherapy regimen, but if it is applied to all people, the outcome will depend on the number of people whose treatment regimen changes from hormone therapy to chemotherapy and vice versa.

Conclusion

Although the results of this study are helpful for policymakers and therapists, it is better to make decisions based on the results of effectiveness and cost in Iran.

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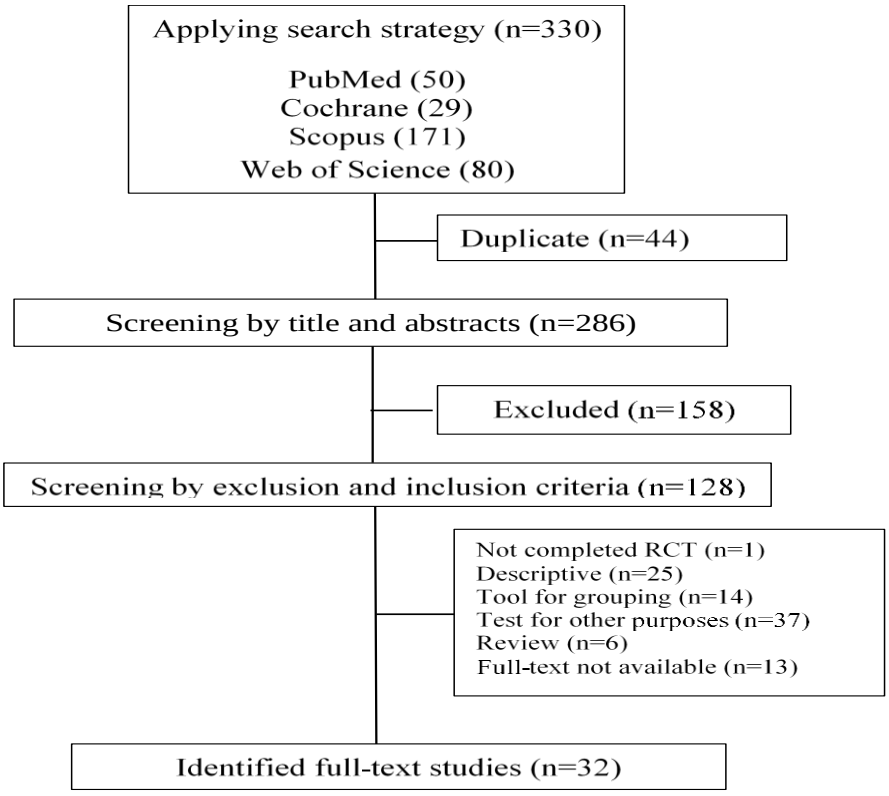

Figure 1: PRISMA Diagram

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