A pooled analysis of the clinical utility of genomic signatures in young women with breast cancer

Ana S. Ferrigno[1], Cynthia De la Garza-Ramos[1], Matteo Lambertini[2], Regina Barragan-Carrillo[3], Hatem A. Azim Jr[1], Cynthia Villarreal-Garza[1]

Hospital Zambrano Hellion TecSalud

Background

Risk stratification by genomic signatures has been shown to improve prognostication and guide treatment decisions among patients with hormone-receptor positive tumors. However, their role in young women with breast cancer (YWBC) has witnessed some controversy.

Methods

A systematic search was performed in the MEDLINE, EMBASE and CENTRAL databases for studies that evaluated the use of commercially available genomic signatures Oncotype DX, Mammaprint, EndoPredict, Breast Cancer Index, Genomic Grade Index and Prosigna in YWBC (i.e. patients aged ≤40 years at diagnosis). Eligible studies were those that included YWBC and disclosed the number of patients per risk category. The Fisher's test for independence was used to assess differences between age groups.

Results

Out of 752,935 women that underwent genomic testing, the minority (3.7%) were YWBC. 742,671 were tested with Oncotype DX, 10,053 with MammaPrint and 211 with EndoPredict. Analysis of this age group was not available for the other tests.

Compared to older patients, YWBC were more likely to be subjected to genomic testing (p=0.02) and had a higher proportion of intermediate- to high-risk tumors when classified by Oncotype DX (p<0.01), MammaPrint (p<0.01), and EndoPredict (p=0.06).

Figure 1. Proportion of breast cancer patients tested for genomic risk according to age (≤40 vs ≥50 years).

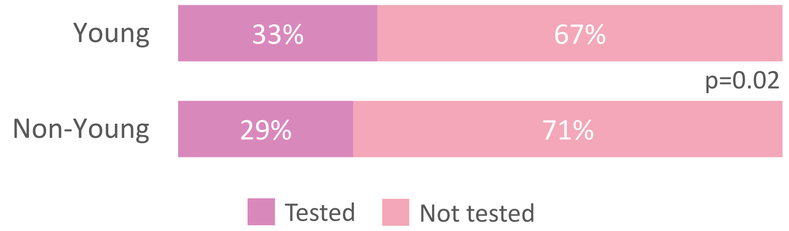
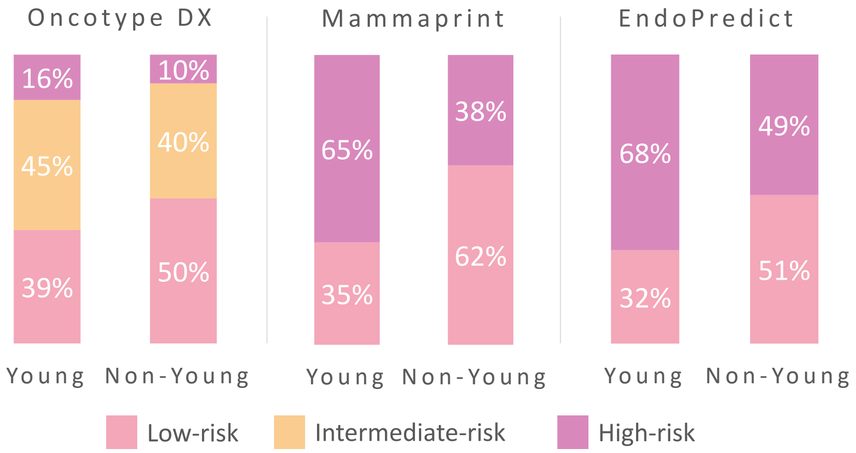


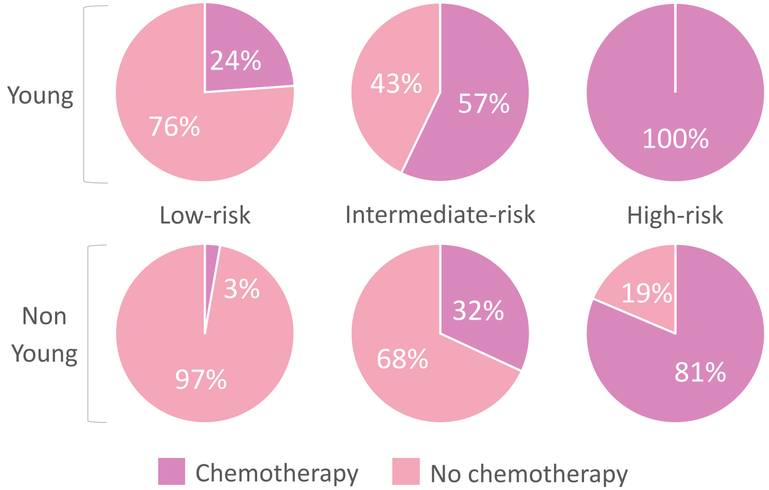
Figure 2. Stratification of genomic recurrence risk according to age.



Only two studies specifically exploring the prognostic value of genomic tests in YWBC were found, both using Oncotype DX. In patients with low genomic risk, 6-year distant recurrence-free survival was 92%, while 5-year overall survival and breast cancer specific survival were nearly 100%.

Nonetheless, YWBC were more likely to receive chemotherapy than older patients when classified as low- (24% vs 3%, p<0.01) or intermediate-risk (57% vs 32%, p<0.01).

Figure 3. Proportion of patients that received chemotherapy according to age and genomic recurrence risk by Oncotype DX.



Conclusions

Only a small proportion of YWBC were included in genomic signature studies, with approximately one-third classified as low-risk. Although the prognostic value of genomic tests for young women is currently available only for Oncotype DX, data support that patients with low genomic risk have an excellent prognosis. Hence, genomic tests could be a useful tool for identifying young patients in whom chemotherapy omission is appropriate.

[1]Breast Cancer Center, Hospital Zambrano Hellion, TecSalud, Mexico [2]Breast Unit, IRCCS Ospedale Policlinico San Martino and Department of Internal Medicine and Medical Specialties, School of Medicine, University of Genova, Italy [3]Department of Oncology, National Institute of Medical Sciences and Nutrition, Mexico