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Title: The effect of neoadjuvant chemotherapy on ductal carcinoma in situ in triple-negative breast cancer patients: a nationwide analysis

Authors E.L. Claassens, R.A.W. Ploumen, L.F.S. Kooreman, M.A.C.E. van Kats, S. Siesling, T.J.A. van Nijnatten, M.L. Smidt

Abstract

Background Ductal carcinoma in situ (DCIS) was considered to be insensitive to systemic treatment. Therefore, presence of DCIS in invasive breast cancer (IBC) patients poses a challenge to the potential of de-escalating breast surgery after neoadjuvant systemic therapy (NST). However, recent studies show that DCIS accompanying HER2+ breast cancer can be eradicated following NST in up to 52%. Since HER2+ IBC and triple-negative breast cancer (TNBC) are known to respond well to NST, it is possible that DCIS adjacent to TNBC shows a similar response.

Research question We aimed to determine the complete response rate of DCIS in TNBC patients in a nationwide cohort and to assess clinicopathological variables associated with response. Furthermore, the impact on surgical treatment after NST was investigated.

Methods Women diagnosed with TNBC, treated with NST followed by surgery, between 2010 and 2020, were selected from the Netherlands Cancer Registry (NCR). Pre-NST and postoperative pathology reports were obtained from Palga, the Dutch nationwide pathology databank, to determine presence of DCIS. Clinicopathological factors associated with DCIS response were investigated using uni- and multivariable logistic regression analysis.

Results In total, 4494 patients were included. A DCIS component was present in the pre-NST biopsy of 442 (9.8%) patients. Pathologic complete response of the DCIS component was achieved in 53.6% (237/442) of these patients. The presence of calcifications in the pre-NST biopsy was associated with a lower chance of DCIS response in univariable logistic regression analysis (OR 0.52, CI 95% 0.27 – 0.98, $p = 0.04$). In multivariable analyses, no statistically significant associations were found between DCIS response and clinicopathological variables. Mastectomy rates were higher in case of IBC+DCIS compared to IBC (53.4% vs 40.1%, $p < 0.001$).

Conclusion Pathologic complete response of DCIS to NST occurred in 53.6% of TNBC patients. Future studies are required to be able to predict DCIS response based on clinicopathological variables and imaging.

(300 words)