Objectives: Forty percent of all breast cancer cases occur among older women (age 65 years and older). This patient group is underrepresented in the currently available studies, which obliges physicians to take treatment decisions based on guidelines and models that are not validated for older patients. With this study we aim to provide insight in predictive factors for recurrence in clinically favourable breast cancer, which can aid in individualizing treatment for older breast cancer patients.

Methods: From the Netherlands Cancer Registry, all patients aged 65 years and older with non-metastatic breast cancer, diagnosed between 2003 and 2006, with a tumour with a maximum size of 5 cm, a clinical stage N0, and primary breast surgery, were included in the analyses. First, we defined a set with most important predictors for recurrence based on literature and expert-knowledge, comprising age, T-stage (T1 or T2), histological grade (1 to 3), morphology (ductal, lobular, mixed or other), oestrogen receptor (ER), progesterone receptor (PR), Her2Neu receptor and multifocality. Primary endpoint was 5-year recurrence, a combined measure of locoregional and distant recurrence. To take account for the competing risk of mortality, the incidence of early stage tumors strongly increased. This implies that the effect of implementation of the screening program on the stage distribution of incident breast cancer in women aged 70–75 years in the Netherlands.

Methods: The Netherlands Cancer Registry was used to include all patients aged 70–75 years who were diagnosed between 1995 and 2011 with invasive or in situ breast cancer. Time trends of incidence rates of different tumor stages were analyzed in linear regression analyses with the incidence rate of both early stage (0, I and II) and advanced stage (III and IV) breast cancer as the outcome, stratified on age groups. Missing values were filled in using multiple imputation.

Results: Overall, 9183 patients were included in this study. After backward elimination we remained with a predictive model comprising four variables: age, T-stage, grade and ER. This model was able to predict 5-years recurrence with a mean AUC of 0.69 (internal validation after bootstrapping with 1000 replications). This AUC was the same as for the full model. Stratification on age groups yielded the same models.

Conclusion: In this national population-based study among older breast cancer patients, we created a predictive model in which age, T-stage, grade and ER can accurately predict 5-years recurrence risk. Interestingly, the potential predictors morphology, Her2, multifocality and PR could be excluded from the model without losing predictive value. This results in a model in which a physician can predict the risk of recurrence based on a pre-operative biopsy, and take treatment decisions on that basis. Future research should determine the external validity of this prediction model, also taking other factors such as comorbidity into account.

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