The purpose of this study is to evaluate the difference in the risk of subsequent cancers between in situ and invasive breast cancer patients by race and age at diagnosis.

Methods
We included first primary female breast cancers diagnosed in 1992-2012 from SEER13. Observed number of subsequent primary cancers (expected number of subsequent primary cancers (O/E) and excess absolute risk (EAR) were calculated to assess the risk of subsequent breast and other cancer.

Results
A total of 24,719 subsequent breast cancer and 36,537 subsequent other cancers were observed among women who had survived 2 months or longer after the diagnosis of the primary breast cancer (443,061 invasive, 96,656 in situ) in 1992-2012.

Overall, the risk of subsequent breast cancer was higher for in situ (O/E = 2.50, EAR=50.5) than invasive breast cancers (O/E =1.58, EAR=20.0). However a reversed pattern was noted for the risk of other subsequent cancers with in situ disease than invasive breast cancer.

The risk of subsequent breast cancer among in situ women increased over time, while the risk of subsequent other cancers decreased over time. Invasive breast cancer survivors had the lowest risk of developing any subsequent cancers 1-4 years post-diagnosis.

Conclusions: Excess risk of subsequent cancers varies by type of breast cancer (in situ/invasive), times from the diagnosis of the first cancer, age, and type of subsequent cancer.

Abstract

Excess risk of subsequent cancers has been found among breast cancer patients. Previous population-based studies focused primarily on invasive cancer. The purpose of this study is to evaluate the difference in the risk of subsequent cancers between in situ and invasive breast cancer patients by race and age at diagnosis.

Methods
We included first primary female breast cancers diagnosed in 1992-2012 from SEER13. Observed number of subsequent primary cancers (expected number of subsequent primary cancers (O/E) and excess absolute risk (EAR) were calculated to assess the risk of subsequent breast and other cancer.

Results
A total of 24,719 subsequent breast cancer and 36,537 subsequent other cancers were observed among women who had survived 2 months or longer after the diagnosis of the primary breast cancer (443,061 invasive, 96,656 in situ) in 1992-2012.

Overall, the risk of subsequent breast cancer was higher for in situ (O/E = 2.50, EAR=50.5) than invasive breast cancers (O/E =1.58, EAR=20.0). However a reversed pattern was noted for the risk of other subsequent cancers with in situ disease than invasive breast cancer.

The risk of subsequent breast cancer decreased with advancing age; and black women had higher risks of subsequent breast cancers than white women for both in situ and invasive cases.

Conclusions: Excess risk of subsequent cancers varies by type of breast cancer (in situ/invasive), times from the diagnosis of the first cancer, age, and type of subsequent cancer.