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alphaB-crystallin is a marker of aggressive breast cancer behavior but does not independently predict for patient outcome: a combined analysis of two randomized studies.

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Abstract

BACKGROUND:

alphaB-crystallin is a small heat shock protein that has recently been characterized as an oncoprotein correlating with the basal core phenotype and with negative prognostic factors in breast carcinomas. The purpose of this study was to evaluate alphaB-crystallin with respect to clinicopathological parameters and the outcome of patients with operable high-risk breast cancer.

METHODS:

A total of 940 tumors were examined, derived from an equal number of patients who had participated in two randomized clinical trials (paclitaxel-containing regimen in 793 cases). Immunohistochemistry for ER, PgR, HER2, Ki67, CK5, CK14, CK17, EGFR, alphaB-crystallin, BRCA1 and p53 was performed. BRCA1 mutation data were available in 89 cases.

RESULTS:

alphaβ-crystallin was expressed in 170 cases (18.1%) and more frequently in triple-negative breast carcinomas (TNBC) (45% vs. 14.5% non-TNBC, $p < 0.001$). alphaB-crystallin protein expression was significantly associated with high Ki67 (Pearson chi-square test, $p < 0.001$), p53 ($p = 0.002$) and basal cytokeratin protein expression ($p < 0.001$), BRCA1 mutations ($p = 0.045$) and negative ER ($p < 0.001$) and PgR ($p < 0.001$). Its overexpression, defined as >30% positive neoplastic cells, was associated with adverse overall survival (Wald's $p = 0.046$). However, alphaB-crystallin was not an independent prognostic factor upon multivariate analysis. No interaction between taxane-based therapy and aβ-crystallin expression was observed.

CONCLUSIONS:

In operable high-risk breast cancer, alphaB-crystallin protein expression is associated with poor prognostic features indicating aggressive tumor behavior, but it does not seem to have an independent impact on patient survival or to interfere with taxane-based therapy.