HSP27 Expression Associated with Luminal Subtypes of Breast Ductal Carcinomas in African American Women

Farhan Khan,1 Luisel Ricks-Santi PhD,2 Tamaro Hudson PhD,1 Desta Beyene PhD,1 Tamney Naab MD,1 1Howard University Hospital, Washington, DC, 2Hampton University, Hampton, VA

Objectives: Heat shock protein 27 (HSP27) is a chaperone that is induced during cellular stress conditions and plays its role by inhibiting apoptosis. It is overexpressed in many cancers. Our objective was to evaluate HSP27 expression by immunohistochemistry in the four major subtypes of breast carcinoma (Luminal A, Luminal B, HER2, and triple negative) in a population of 202 African American (AA) women with other clinicopathological factors.

Methods: Tissue microarrays were constructed from formalin-fixed paraffin-embedded tumor blocks from primary ductal breast carcinomas in 202 AA women. Two separate 1 mm cores represented each case. Sections measuring 5 μm each were stained with mouse monoclonal antibody against HSP27 (Santa Cruz). The sections were evaluated for intensity of cytoplasmic and nuclear staining (1-3) and percentage of reactive cells; H-score was derived from the product of these measurements. Analysis was performed as a continuous variable. Bivariate analysis was done via χ2 analysis, and survivability data were calculated via the generation of Kaplan-Meier curves (SPSS v19). Statistical significance was assumed if P < .05.

Results: HSP27 expression was associated with progesterone receptor-positive (P < .001), luminal subtype (P < .0001), grade II (P = .014) and stage III (P = .027) breast ductal cancers.

Conclusions: Our study finding of selective expression of HSP27 in luminal subtypes breast ductal cancers in AA women suggests that antiapoptotic mechanisms predominate in the pathogenesis of these tumors. Some studies have shown that HSP27 acts as an antioxidant, regulates cytoskeleton remodeling, and promotes activation of nuclear factor-Kb (NF-kB), the key transcription factor for induction of survival genes in cells. HSP27 overexpression might be useful in differentiating benign from well differentiated cancers. Targeting HSP27 activity may be effective as neoadjuvant therapy in luminal breast cancers.