Folate Receptor α Immunohistochemistry in Cytology Specimens of Metastatic Breast Carcinoma

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Folate receptor α (FRA) is involved in folate accumulation and utilization and is expressed in varying proportions in epithelial cells of breast, ovary, and parotid gland, among others. FRA overexpression by immunohistochemistry (IHC) has been shown in estrogen (ER)/progesterone (PR)–negative carcinoma (40-74%) and in triple-negative breast carcinoma (TNBC) (50-86%) in histologic specimens of primary breast cancers. We assessed the feasibility of IHC in detecting FRA expression and its patterns and clinical significance in metastatic TNBC in fine needle aspiration (FNA) cell blocks (CB). Metastatic breast ductal carcinoma cases were retrospectively assessed by FRA IHC (clone BN3.2; 1:100 dilution; Leica Biosystems, Bannockburn, IL) on FNA CB. FRA staining was scored qualitatively (positive vs. negative), by intensity (0 = negative; 1 = weak positive; 2 = moderate positive; 3 = strong positive), and by staining area (0-100%). Results were correlated with breast prognostic markers ER, PR, and Her-2/neu (H2N) performed by routine IHC. A total of 40 FNA CBs with metastatic disease were studied, including hormone-positive (n = 5), triple-positive (n = 5), H2N-only-positive (n = 5), and TNBC (n = 25). FRA IHC showed immunoreactivity with moderate positivity in only 1 (4%) of TNBC. All the remaining 39 cases were negative for FRA expression. Our data suggests that FRA expression by IHC was rarely associated with ER/PR-negative tumors relative to ER/PR-positive tumors and, more importantly, with TNBC in FNA CB. This finding may have clinical significance and prognostic implications in metastatic breast carcinoma. Hence, antifolate receptor therapies do not appear to be clinically relevant in TNBC, based on immunostaining of FNA CBs of metastatic breast cancers.

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