Tumor Biology

Abstract 1059: EpCAM differentially expressed on circulating and disseminated tumor cells promotes tumor metastasis in breast cancer patients

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Abstract

To investigate the role of EpCAM expressed on both circulating tumor cells (CTCs) in peripheral blood and disseminated tumor cells (DTCs) in bone marrow with respect to tumor metastases, the integrated subtraction enrichment and immunostaining-FISH (SE-iFISH) was performed to quantify, phenotypically and karyotypically characterize cytogenetically abnormal CTCs and DTCs expressing EpCAM in breast cancer patients. In a cohort of 34 recruited late stage patients, consisting of 32 metastatic and 2 non-metastatic subjects, the average number of detected CTCs in metastatic vs non-metastatic patients was 25 and 18 cells, respectively. Among those CTCs in metastatic subjects, 23.4% of them showed EpCAM+, whereas none of EpCAM+ CTCs was detected in non-metastatic patients. There were total of 49 CTC clusters detected in metastatic patients, and 33% of those clusters were EpCAM+, however, only 3 CTC clusters were found in non-metastatic patients, and none of them was EpCAM+. In the case of DTCs, the average number of 2224 and 364 DTCs per subject was detected in metastatic vs non-metastatic subjects, with EpCAM+ ratio of 66.53% in metastatic and 8% in non-metastatic patients. Analysis of DTC clusters indicated that the average of 226 and 21 DTC clusters/subject were identified in metastatic and non-metastatic patients, respectively, and metastatic subjects showed 62% of DTC clusters EpCAM+, whereas 37% of clusters were EpCAM+ in non-metastatic patients. Comparing to the breast cancer serum biomarker CA15-3 detected in 32 metastatic cancer patients, showing positivity (≥28 ng/ml) of only 41% (13 out of 32), both CTCs (≥5) and DTCs (≥5) had a positivity rate of 81 (26 out of 32) and 97% (31 out of 32), respectively. Obtained results indicated that EpCAM+ CTCs and DTCs are reliable markers in terms of evaluating therapeutic efficacy and predicting cancer patients' prognosis.

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