

Expression of epithelial and mesenchymal markers in invasive (ductal) breast carcinoma and nodal metastasis

L.Y. V. Pathirana¹, E. H. Siriweera², H. A. Amaratunga¹, S. B. Adikari¹ and N. P. A. D. Gunasinghe¹

Department of Anatomy, Faculty of Medicine, University of Peradeniya, Sri Lanka¹
Department of Pathology, Faculty of Medicine, University of Peradeniya, Sri Lanka²

DOI: <http://doi.org/10.4038/jdp.v11i2.7710>

Introduction

The phenomenon, Epithelial-mesenchymal transition (EMT) has been shown to enable epithelial cells to acquire a mesenchymal phenotype facilitating cancer cell mobilization. Evidence in favour has been derived predominantly from cancer cell lines and/or animal model studies. The objectives of this study were to observe E-cadherin and vimentin expression patterns in invasive (ductal) breast carcinoma-no special type (BCa) and corresponding metastatic lymph nodes (mLNs) and to compare the expression of these markers in BCa with and without metastasis using clinical samples.

Methodology

Tissues of 24 metastatic BCa (mBCa) with mLNs and 17 non metastatic BCa (nmBCa) obtained from the Department of Pathology, Faculty of Medicine, Peradeniya were included. Immunohistochemical expression of E-cadherin (epithelial cell adhesion membrane marker) and vimentin (mesenchymal cytoplasmic marker) was observed on all BCas and mLNs. Ten random high-power fields (10x40) of 100 cells each were assessed to determine the percentage of positive cells. The mean expression of markers was compared between mBCa and nmBCa by independent sample T-test and mBCa and mLN by paired sample T-test.

Results

The mean E-cadherin expression was 70.54% (27.67%-97.67%) in mBCa, 86.40% (63.33%-96.67%) in nmBCa and 89.95% (46.33%-100%) in mLNs. The mean vimentin expression was 6.54% (2.37%-13.87%) in mBCa, 5.39% (2.12%-9.77%) in nmBCa and 1.28% (0.13%-8.25%) in mLNs. The E-cadherin expression was significantly lower in mBCa compared to nmBCa ($p=0.002$) and in mBCa compared to mLNs ($p=0.000$). Vimentin expression was not significant between mBCa and nmBCa ($p=0.176$). Higher vimentin expression in mBCa compared to mLNs was statistically significant ($p=0.000$).

Discussion and conclusion

The significantly lower expression of E-cadherin in mBCa compared to nmBCa suggests that loss of epithelial cell properties promotes metastasis. Significantly lower E-cadherin and significantly higher vimentin expressions in mBCa compared to mLNs is supportive of EMT in BCa. The reversed pattern is noted in nodal BCa metastasis suggesting the possibility of mesenchymal-epithelial transition of metastatic cancer cells in the lymph node.

Financial assistance from University of Peradeniya (RG/AF/2013/32/M) is acknowledged.