Bushra Sikander

Dow University of Health and Sciences, Pakistan

# Quantification of immune cells in breast cancer microenvironment in relation to NPI and molecular subtyping

**Background**: Breast cancer is the most common malignancy in females across the globe. Since breast tumour microenvironment is bathed with a range of immune infiltrates, it is a potential, but largely unfathomed, candidate for immunotherapy. However, exact mechanistic links between immune infiltrates and breast carcinogenesis are largely unclear. Moreover, leukocyte densities at various stages of breast tumourigenesis are largely understudied. In this study, we have investigated immune cell densities of leukocytes in breast cancer and correlated these with known prognostic factors.

**Objective**: To investigate the microenvironment of breast cancer and enumerate the number and type of cells and analyze their correlation with NPI and molecular sub-typing.

**Methodology**: A total of 208 tissues were analyzed (104 cases and 104 controls). Breast cancer tissues were classified using conventional histological sub-typing, molecular sub-typing (using α-ER, α-PgR and α-Her-2 antibodies) and NPI scoring. Quantification of immune cells/mm2 was performed using H&E (for neutrophils), special stains (Giemsa for macrophages and Toluidine blue for mast cells), α-CD3 antibodies (T-lymphocytes) and α-CD20 antibodies (B-lymphocytes). Data were entered and analyzed using SPSS version 16. Correlation of immune cell densities with prognostic indices was investigated using t-test and Fisher's exact test. A p-value of <0.05 was considered as significant.

**Results**: Our data demonstrate significantly increased infiltration of T-lymphocytes (p-value= 1.43×10-26), B-lymphocytes (p-value= 2.13×10-17), neutrophils (p-value = 4.53×10-08) and mast cell (p-value=1.20×10-10), in breast cancer tissue compared to controls. Moreover we demonstrate a significant association (p-value = 0.009) between tumour infiltrating CD3 T-lymphocytes and molecular sub-types of breast cancer i.e. luminal; A, B, Her2 overexpression and triple negative/basal like. Importantly, we report increased T-lymphocytes infiltration in worst prognostic groups i.e. Triple negative and luminal B. Our data also demonstrates that there is no significant association (p-value = >0.05) between NPI scoring and breast cancer associated immune cells (T-lymphocytes, B-lymphocytes, neutrophils, macrophages and mast cells)

**Conclusion**: We reported the conventional breast tumour classification system, based primarily on grading and NPI scores, is used routinely and has several advantages, is considerably limited in terms of identifying patients' prognosis and therapeutic options/outcomes. The increased infiltration of neutrophils, mast cells, T and B lymphocytes in breast tumour microenvironment compared to the controls and specially increase in worst prognostic groups i.e. triple negative/basal like and luminal B tumours is suggestive of their crucial role in breast tumourigenesis.

## Biography

Bushra Sikander has completed M.Phil. (Histopathology) from Dow University of Health & Sciences and MBBS from Dow Medical College (2004-2009). Currently she is working as Assistant Professor at the very same University. Her topic of interest are Breast Cancer, Cancer Immunology. For her work, she has been honored with many academic professional certificates.

bushra_sikandar@yahoo.com