BRITISH COLUMBIA SURGICAL SOCIETY
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ABSTRACT FORM

Instructions to Authors

The Abstract should be submitted by a member of the BC Surgical Society or candidate group.

The Abstract should be typed in 12 font with paragraphs indented 3 spaces, and the following headings all fitting into the box below:

• Title (underline presenter) • Authors • Introduction • Methodology •Results • Conclusions

Permission to publish this Abstract should be given by senior author.

Title: Evaluation Of Type 1 Growth Factor Receptor Family Expression In 205 Thyroid Lesions Reveals Diagnostic Utility And Targeted Therapeutic Potential For HER1, HER3, and HER4

Authors: Sam Wiseman, Obi Griffith, Adrienne Melck, Ashish Rajput, Steven Jones

Introduction: The accurate preoperative diagnosis and prognostication of thyroid cancer in individuals who present with nodular thyroid disease has remained a major clinical challenge. The aim of this study was to evaluate the diagnostic and prognostic utility of the type 1 growth factor receptor (T1GFR) family (HER1, HER2, HER3, HER4) in the management of DTC. A secondary objective was to evaluate the proportion of DTC expressing T1GFR family members.
Methodology: Tissue microarrays (TMAs) consisting of 100 benign thyroid lesions, 105 malignant thyroid lesions were stained for HER1, HER2, HER3, and HER4. Correlation of clinicopathologic characteristics with expression of each of the markers was assessed with contingency table tests (χ^2 or Fisher's Exact where appropriate) for categorical variables and the Mann-Whitney U-test for continuous variables. A *p* value of less than 0.05 was considered statistically significant. The Benjamini and Hochberg (BH) procedure was used to correct p-values for multiple testing. To test whether this combination of markers would be useful for diagnostic discrimination of DTC from benign samples, all four markers were submitted as potential variables to a Random Forests classifier.
Results: HER1, HER2, HER3, and HER4 were expressed in 76%, 2%, 57%, and 73% of DTC cases respectively. HER1 and HER3 showed significantly increased expression in DTC compared to benign thyroid lesions (76.3% vs. 59.6%, p=0.022 and 56.5% vs. 34.3%, p=0.013, respectively). HER4 showed significantly decreased expression in DTCs compared to benign thyroid lesions (72.7% vs. 85.9%, p=0.032). For HER2 there was no significant difference in expression between benign and DTC lesions. Before multiple testing correction, the expression of HER3 correlated with the presence of lymph node metastasis (p=0.012), tumor type (only follicular carcinoma stained negative) (p=0.013), and higher N stage (p=0.022); the expression of HER4 correlated with lower T stage (p=0.037). However, none of these associations were still significant after multiple testing correction by the BH procedure. A classifier targeting benign versus malignant status with all four markers as potential predictors displayed an accuracy, sensitivity and specificity of 67.2%, 60.4%, and 74.0% , respectively.
Conclusions: Expression of the T1GFR family helps distinguish DTCs from benign thyroid lesions and the high proportion of cancers which expressed HER1, HER3, and HER4 suggests that investigation of currently utilized anticancer agents, which target one or more of these family members, warrants further clinical study in individuals diagnosed with DTC.

Presenter: Sam Wiseman, MD, FRCSC, FACS
Institution: Department of Surgery St. Paul's Hospital, University of British Columbia, & Genome Sciences Center BCCA
(Name)

Mail Abstract to:

Dr. Richard Finley, Program Chair
c/o BC Surgical Society
#115-1665 West Broadway
Vancouver, BC V6J 5A4
Fax: (604) 638-2938

St. Paul's Hospital Dept. of Surgery,
C303-1081 Burrard Street,
Vancouver, BC, V6Z 1Y6
Phone (604)-806-9108

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