Harsimar Kaur et al., J Cytol Histol 2017, 8:2 (Suppl)
DOI: 10.4172/2157-7099-C1-012

Role of cytology specimens in subtyping of pulmonary adenocarcinoma patterns and molecular analysis: A comparative study with matched small biopsies

Harsimar Kaur, Aruna Nambirajan, Deepali Jain, Kirti Jingra, Varsha Singh, Karan Madan, Sandeep R Mathur and **Venkateshwaran K Iyer**
All India Institute of Medical Sciences, India

Background & Aim: Pulmonary adenocarcinoma (AD) is one the commonest malignancies, with most patients presenting with inoperable disease and small biopsies/cytology specimens being the only diagnostic material available. Recently, a 3-tiered histological classification was developed for Stage-1 lung AD, comprising of grade-1 (lepidic pattern), grade-2 (acinar, papillary patterns) and grade-3 (solid and micropapillary patterns) with prognostic implications. One previous study found that distinctive cytological features of AD correlate with histological differentiation and is of prognostic value. We aimed to correlate architectural patterns between paired cytological and histological samples and to perform molecular analysis on archived aspirate smears.

Materials & Methods: Cytology specimens (aspirates and bronchial brushings) from 100 patients with matched histology specimens (Trucut biopsy) were reviewed. We evaluated cellularity, cell arrangement (flat sheets vs. 3D clusters vs. single cells), nuclear features (size, shape and contour), nucleoli (prominent and inconspicuous), nuclear inclusions, chromatin and quality of background. A consensus regarding predominant pattern on cytology and histology samples was made by two independent observers. Concordance rates were determined. Molecular analysis for EGFR mutations was performed on a subset of cases using material scrapped from dry smears.

Observations & Results: The common cytology patterns determined were solid (39/100) followed by acinar (31/100), lepidic (13/100), papillary (5/100) and mucinous (2/100), while consensus on pattern could not be achieved in remaining. There was poor concordance with the predominant pattern on the small biopsies, ranging from 0% for papillary to a maximum of 58% for solid pattern. While the cytology patterns did not correlate with survival, the nuclear features fairly correlated with survival. Molecular analysis was successfully performed on 20 cases, of which only two cases with acinar morphology showed EGFR mutations (L858R mutation and exon-19 deletion).

Conclusion: The proper triage of cytology material for diagnosis and molecular analysis is vital and is the need of the hour. The inherent pattern heterogeneity of pulmonary ADs precludes accurate pattern based prognostication on cytology samples; however, nuclear grading is a more consistent prognostic indicator.

Biography

Harsimar Kaur is a graduate of All India Institute of Medical Sciences, the best ranked medical school in India. She secured Rank 1 in All India Pre-Medical Entrance Test, amongst thousands of applicants. She has gained pathology experience across multiple institutes of repute in US, namely at NIH, the Mayo Clinic, the Weill Cornell Medical College, and is currently at the Johns Hopkins Hospital working in Dr Tamara Lotan's lab.

harsimar.bhatia@gmail.com

Notes: