

Research paper 1

Assessment of tumor infiltrating lymphocytes by a web-based image analysis

A.K. Adhya*, M. K. D. Biswas, S. Mitra, S. Purkait, M. Sethy

Department of Pathology and Laboratory Medicine, All India Institute of Medical Sciences, India

Introduction and objectives: Assessment of tumor-infiltrating lymphocytes (TILs) is an established prognostic marker for many cancers. We aimed to evaluate the utility of a web-based image analysis method for enumerating TILs.

Methodology: Forty tumour blocks of oral squamous cell carcinoma were chosen, and immunohistochemistry (IHC) for CD3, CD8, CD4, and FOXP3 were performed on the tumour sections of each case. Whole sections of the tumour were used for analysis. Images of the IHC stained slides were captured at 200X from each slide. Images were analysed using FIJI / Image J software from NIH downloaded from the website <https://imagej.nih.gov>. Particle sizes of 8-10 microns were measured, and a positive area fraction was calculated. The final positive area fraction of each IHC stained slide was calculated using the mean of the values of the ten images for each slide. The positive area fraction/ case of each IHC stained slide was converted into a percentage scale for statistical analysis.

Results: The average time taken to assess TILs by the web-based image analysis method for one slide was one minute. Different IHC patterns; membranous(CD4), cytoplasmic (CD3, CD8) and nuclear (FoxP3) could be satisfactorily analysed. The data obtained by the web-based image analysis was in concordance with the data obtained by the visual assessment (eyeballing) method.

Discussion and conclusions: The web-based image analysis software does not require high storage capacity and can be run on routine office desktops or laptops, unlike the whole slide imaging digital slide scanners. It is cost-effective, easy to perform and brings more objectivity to the assessment as compared to visual counting.

Keywords: tumor infiltrating lymphocytes, image analysis

Corresponding author: Dr. AK Adhya

Department of Pathology and Laboratory Medicine,

All India Institute of Medical Sciences, India

pathol_amit@aiimsbhubaneswar.edu.in



This is an open access article licensed under a [Creative Commons Attribution-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-sa/4.0/). (CC BY-SA 4.0), which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are attributed and materials are shared under the same license.