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The usefulness of Alcian blue stain in confirming goblet cells in oesophageal biopsies with columnar metaplasia

M.M.F. Rimashana[1], L.D.K. Bulathgama[2], Sulochana Wijetunge[2]

[1]*Medical Laboratory Sciences, Faculty of Allied Health Sciences, University of Peradeniya, Sri Lanka.*
[2]*Department of Pathology, Faculty of Medicine, University of Peradeniya, Sri Lanka.*

Introduction: Intestinal metaplasia in the oesophagus is a premalignant complication of gastrooesophageal reflux. Although using Alcian blue (AB) stain to confirm goblet cells in oesophageal biopsies is a common practice, it is discouraged due to high false positive rates. The objective of this study was to assess the reliability of AB in identifying goblet cells in oesophageal biopsies.

Method: This is a cross-sectional study of 38 samples of gastro-oesophageal junctional biopsies obtained from patients undergoing upper gastrointestinal endoscopy for dyspeptic symptoms. These were assessed initially with haematoxylin and eosin-stained sections, and 30 samples of cardiac mucosa with pooled mucin mimicking goblet cells and 8 with true goblet cells were selected. Ten normal antral biopsies were taken as negative controls. All were stained with AB (pH 2.5). The Fisher's exact test (at $p<0.05$) was used to assess statistical differences.

Results: The AB staining pattern in goblet cell mimics showed negative (10), mild (16) and moderate (4) staining; none had strong staining. All 8 cases with goblet cells were positive with AB, 7 had strong and one had moderate staining. All antral biopsies were negative. When any degree of AB staining was regarded as positive, positive rates in true goblet cells and its mimics were statistically not significant ($p=0.08$). When only strong AB staining was regarded as positive, the difference was significant ($p<0.0001$).

Discussion: The false positivity rate with AB among goblet cell mimics was 66.7% (n=20/30), which is unacceptably high. However, all false positive cases had either mild or moderate staining. Strong positivity was seen only in true goblet cells ($p<0.0001$).

Conclusion: AB can be used to confirm the presence of goblet cells only if strong staining is considered as positive. Interpretation of any degree of staining as positive leads to false positive diagnosis of goblet cells.

Corresponding author: Dr. Sulochana Wijetunge
Department of Pathology, Faculty of Medicine
University of Sri Peradeniya, Sri Lanka
sulochana.wijetunge@med.pdn.ac.lk