Narrow-band imaging and white-light endoscopy with optical magnification in the diagnosis of dysplasia in Barrett’s esophagus: results of the Asia-Pacific Barrett’s Consortium

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Objective: The advent and utility of new endoscopic imaging modalities for predicting the histology of Barrett’s esophagus (BE) in real time with high accuracy appear promising and could potentially obviate the need to perform random biopsies where guidelines are poorly adhered to. We embarked on evaluating the performance characteristics of white-light endoscopy with magnification (WLE-z), narrow-band imaging with magnification (NBI-z) and a combination of both modalities.

Design: This was a prospective online study with 28 endoscopists from 11 countries (Asia-Pacific region) participating as assessors. In total, 35 patients with BE were assessed using 150 slides from WLE-z and NBI-z randomly arranged using a simple classification with corresponding histology. The overall Accuracy (Acc), Sensitivity (Sn), Specificity (Sp), Positive Predictive Value (PPV), and Negative Predictive Value (NPV) of WLE-z, NBI-z and a combination of both were calculated.

Results: The overall Acc for WLE-z and NBI-z images was 87.1% and 88.7%, respectively. When images from the two modalities were placed side by side, the Acc increased to 90.3%. The Sn, Sp, PPV, and NPV of WLE-z were 48%, 92%, 90%, and 93% while with NBI-z, these improved to 89%, 89%, 56%, and 98%, respectively. When both imaging modalities were viewed together, they improved further to 93%, 90%, 61%, and 99%.

Conclusion: The high NPV (99%) when both WLE-z and NBI-z were used simultaneously indicates that areas with regular appearance that are diagnosed with confidence can effectively be left alone and not biopsied when performed at a skilled resourced center. This approach could potentially lead to a paradigm shift of how patients with BE are assessed.

Introduction

Barrett’s esophagus (BE) is the only known pre-malignant precursor of esophageal adenocarcinoma, a tumor that is rapidly increasing in the developed world [1]. At present, endoscopic surveillance with white-light endoscopy (WLE) and random 4-quadrant biopsies is considered the standard of care for detecting intestinal metaplasia and neoplasia in BE. However, current recommended guidelines for surveying patients with BE are time consuming and poorly adhered to [2]. Over the last decade, new endoscopic imaging technologies have shown great promise in detecting dysplasia and early neoplasia in BE [3–8]. Histology can be predicted with high accuracy potentially making surveillance cost-effective. Recent data have emerged that a targeted biopsy approach using Narrow-Band Imaging (NBI) could be considered in patients undergoing surveillance for BE [9]. Given the low prevalence in BE, endoscopists from the Asia Pacific region may be less experienced with this condition. On the other hand, they may be well versed with image enhancing endoscopic modalities given the high prevalence of gastric cancers, especially in East Asia. We embarked on a study to evaluate the performance characteristics of WLE with optical magnification (WLE-z), NBI with optical magnification (NBI-z) and a combination of both modalities in the assessment of patients presenting for surveillance endoscopy for BE amongst a large group of endoscopists from the Asia Pacific region.

Methods

A total of 28 endoscopists from 11 countries (Asia-Pacific Barrett’s Consortium) who have an interest in BE were invited to participate in an online study. Fifty images of WLE-z and 50 corresponding images of NBI-z in BE with corresponding histopathology were prospectively collected.