A multicenter randomized comparison between high-definition white light endoscopy and narrow band imaging for detection of gastric lesions

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Objective Narrow band imaging (NBI) is generally considered to be useful for lesion characterization, but not enhanced detection of gastric lesions, because of the dark endoscopic view. We tested whether the new generation of NBI (190-NBI or 290-NBI), which is twice as bright as the previous version, would improve detection of premalignant gastric lesions compared with high-definition white light endoscopy (HD-WLE).

Patients and methods This was a multicenter prospective randomized study involving five tertiary institutions in the Asia-Pacific region. A total of 579 patients aged older than 50 years who underwent diagnostic upper gastrointestinal endoscopy were randomized to either HD-WLE or NBI. The outcome measurements were detection of intestinal metaplasia (IM), focal gastric lesions, and gastric cancers.

Results Focal gastric lesions were detected in 83/286 (29%) and 119/293 patients (40.6%) by HD-WLE and by NBI, respectively (P = 0.003). IM was detected in 22/286 patients (7.7%) by HD-WLE and in 52/293 patients (17.7%) by NBI (P < 0.001). Gastric cancer were found in 7/286 (2.4%) and 3/293 patients (1%) in HD-WLE and NBI groups, respectively (P = 0.189).

Conclusion NBI increased the detection rate of IM compared with HD-WLE. Eur J Gastroenterol Hepatol 00:000–000

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Introduction

It is recognized that upper gastrointestinal (UGI) endoscopy can miss premalignant and even cancerous lesions in the stomach [1–3]. This could conceivably be because of the fact that mucosal changes with these lesions are subtle.

Chromoendoscopy has been used routinely in some centers during UGI endoscopy in an attempt to improve mucosal contrast and detect subtle mucosal lesions [4]. However, this is not the norm in most centers because of the inconvenience of dye spray. Narrow band imaging (NBI) (Olympus Co., Tokyo, Japan) facilitates the examination of the mucosal surface without a need for chromoendoscopy. It is based on the principle that the depth of penetration of light is wavelength dependent, with shorter wavelengths resulting in more superficial penetration, that is blue light penetrates most superficially (mucosal imaging) whereas red light penetrates the deepest (submucosal imaging). In NBI, a rotating interference narrow band filter is interposed after the xenon light source such that when the NBI mode is switched on, discrete blue and green wavelengths are used and this improves mucosal surface contrast and facilitates visualization of mucosal details [5]. It has been shown to be useful for differentiation of focal gastric lesions (FGL) such as gastric cancer (GC), adenoma, and intestinal metaplasia (IM), especially when combined with optical magnification [6–10]. However, it is generally not considered to be useful in increasing detection rates [11]. This may be because of the dark endoscopic view and dimmer images with the earlier NBI systems.

The latest NBI system (190-NBI or 290-NBI) provides endoscopic images at least two-fold brighter than the older version and in full high definition. This may possibly increase the detection rate of FGL by enhancing the visibility of the gastric mucosa with brighter NBI images. In addition, although there is no optical magnification, the system has digital magnification and a setting called ‘dual or near focus’ that allows the user to select between two focus settings to achieve the desired depth of field for optimal observation. The resultant image magnification is mid-way between full optical magnification and digital magnification.

In this study, we hypothesize that the second-generation NBI system would enhance the detection rate of FGL compared with high-definition white light endoscopy (HD-WLE). The primary aim was to compare the detection