Multicenter randomised controlled trial comparing the high definition white light endoscopy and the bright narrow band imaging for colon polyps

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Author contributions: Singh R and Lau JYW conceptualized and designed this study; Singh R, Cheong KL, Mangira D, Koay DSC, Ng SC, Rerknimitr R, Aniwan S, Ang TL, Goh LK, Ho SH and Lau JYW recruited the patients involved in this study; Singh R, Cheong KL, Zorron Cheng Tao Pu L, Kee C and Lau JYW interpreted the data, performed statistical analyses, and edited the manuscript into its final version to be published.

Institutional review board statement: Institutional medical and ethics committees of each participating hospital approved the study protocol.

Clinical trial registration statement: This study is registered at https://clinicaltrials.gov. The registration identification number is NCT01422577.

Informed consent statement: All study participants, or their legal guardian, provided informed written consent prior to study enrollment.

Conflict-of-interest statement: The authors declared no conflicting interests (including, but not limited to, commercial, personal, political, intellectual, or religious interests) related to the manuscript submitted for consideration of publication.

Data sharing statement: Technical appendix and dataset available from the corresponding author at rajvinder.singh@sa.gov.au. Participants gave informed consent for data sharing.

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Manuscript source: Invited manuscript

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Received: January 17, 2017
Peer-review started: January 19, 2017
First decision: March 13, 2017
Revised: April 07, 2017
Accepted: May 18, 2017
Article in press: May 19, 2017
Published online: June 16, 2017
Abstract

AIM
To compare high definition white light endoscopy and bright narrow band imaging for colon polyps’ detection rates.

METHODS
Patients were randomised to high definition white light endoscopy (HD-WLE) or the bright narrow band imaging (bNBI) during withdrawal of the colonoscope. Polyps identified in either mode were characterised using bNBI with dual focus (bNBI-DF) according to the Sano’s classification. The primary outcome was to compare adenoma detection rates (ADRs) between the two arms. The secondary outcome was to assess the negative predictive value (NPV) in differentiating adenomas from hyperplastic polyps for diminutive rectosigmoid lesions.

RESULTS
A total of 1006 patients were randomised to HD-WLE (n = 511) or bNBI (n = 495). The mean of adenoma per patient was 1.62 and 1.84, respectively. The ADRs in bNBI and HD-WLE group were 37.4% and 39.3%, respectively. When adjusted for withdrawal time (OR = 1.19, 95%CI: 1.15-1.24, P < 0.001), the use of bNBI was associated with a reduced ADR (OR = 0.69, 95%CI: 0.52-0.92). Nine hundred and thirty three polyps (86%) in both arms were predicted with high confidence. The sensitivity (Sn), specificity (Sp), positive predictive value and NPV in differentiating adenomatous from non-adenomatous polyps of all sizes were 95.9%, 87.2%, 94.0% and 91.1% respectively. The NPV in differentiating an adenoma from hyperplastic polyp using bNBI-DF for diminutive rectal polyps was 91.0%.

CONCLUSION
ADRs did not differ between bNBI and HD-WLE, however HD-WLE had higher ADR after adjustment of withdrawal time. bNBI surpassed the PIVI threshold for diminutive polyps.

Key words: Narrow band imaging; Dual focus; High definition; White light endoscopy; Colon; Polyps; Randomised controlled trial

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Core tip: Adenoma detection rate (ADR) is one of the most important quality measures in colonoscopy and bright narrow band imaging (bNBI) can theoretically improve imaging and thus reconnaissance of colorectal polyps. In addition, the magnification using bNBI with dual focus (bNBI-DF) allows the prediction of the polyp’s histology. This multicenter randomised controlled trial was conceived to compare the ADR of high definition white light endoscopy (HD-WLE) vs bNBI during withdrawal of screening colonoscopies. No difference was found in ADR between HD-WLE and bNBI. The prediction of diminutive distal polyps with bNBI-DF was satisfactory according to the American Society for Gastrointestinal Endoscopy’s threshold.

INTRODUCTION
Colorectal cancer is a leading cause of morbidity and mortality worldwide[1]. Its incidence in Asia-Pacific region has been rising at an alarming rate[2,3]. Screening colonoscopy and polypectomy have been shown to reduce the mortality related to colorectal cancer[4]. Despite its effectiveness, the potential to miss polyps can range between 15% to 30% with screening colonoscopy[5]. Current guidelines recommend removal of all visible polyps (except benign diminutive distal polyps) and subjection to histological assessment, irrespective of their endoscopic morphological features. This could make colonoscopy a less cost effective screening strategy[6]. Novel image enhanced endoscopic technologies have the potential to overcome some of the limitations of standard while light endoscopy (WLE) by increasing the detection rate of polyps/neoplasms and providing real-time histological diagnosis.

Narrow band imaging (NBI) is one of the most widely available and convenient to use technologies developed. Narrowed bandwidth light is used to visualize superficial vasculature and mucosal pit patterns in real-time[7,8]. The light penetrates the mucosa and submucosa and is absorbed by hemoglobin in surface microvessels, which appear as linear darker structures[9]. This enables the endoscopist to differentiate thicker and more irregular vascular landmarks. Multiple classification systems based on surface pit-pattern and vascular pattern have been developed and validated to differentiate hyperplastic polyps from adenomatous polyps[10,11]. This real-time differentiation has been proposed as a part of “resect and discard” strategy in which diminutive polyps (measuring < 5 mm) are resected without histological assessment and hyperplastic polyps in rectosigmoid region are left in situ[12]. This approach could confer substantial cost savings by avoiding unwarranted histological evaluation[13] and may avoid complications related to polypectomy[14]. Few published studies showed no significant difference in adenoma detection rates (ADRs) between NBI and WLE[15-18]. Only one meta-analysis demonstrated an increased accuracy of NBI over WLE in characterising colonic polyps with hierarchical summary receiver-operating characteristic