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Study Summary

Comparing Endoscopic Interventions to Improve Serrated Adenoma Detection Rates During Colonoscopy

A Systematic Review and Network Meta-analysis of Randomized Controlled Trials

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Conclusion

In a network meta-analysis, add-on devices (particularly the ENDOCUFF VISION™ device), Narrow Band Imaging™ technology, Water based techniques (WBT) and chromoendoscopy were comparable to each other and improved serrated adenoma detection rate (SADR) compared to high-definition colonoscopy alone.

Objective

To compare all the available endoscopic interventions for improving SADR through a network meta-analysis.

Design

Systematic Reviews and Network Meta-Analyses* of RCTs (Evidence level 1a, according to Oxford Center Evidence based Medicine (2009))

* Network analysis is a method of analysis that indirectly compares the effects of multiple interventions.

A direct meta-analysis is used when integrating the effects of clinical trials that directly compare Intervention A and Intervention B. However, there are situations in which there are direct comparisons between intervention A and intervention B or intervention A and intervention C, but there are no (or few) studies comparing intervention B and intervention C. In such cases, network meta-analysis is a method that allows us to examine the effects of indirect comparisons between intervention B and intervention C based on the effects of direct comparisons between intervention A and intervention B or intervention A and intervention C.

Primary Outcome

Serrated adenoma detection rate (SADR) through a pairwise and network meta-analysis.

Participant Characteristics

- A total of 28 RCTs with 22 830 patients were included.
- The studies compared the efficacy of add-on devices (Endocap (ECA), EndoCuff (ECU), ENDOCUFF VISION device (ECV), G-EYE, endorings, AmplifEYE), electronic chromoendoscopy (linked-color imaging, blue laser imaging, Narrow Band Imaging technology), dyebased chromoendoscopy, full-spectrum endoscopy (FUSE) and water-based techniques (WBT) with each other or highdefinition colonoscopy.
- Across all studies, no significant baseline imbalance was found in terms of mean age range (50.3–67.7 years), male gender (53.7%), mean cecal intubation time range (3.3–15 mins) and withdrawal time (6–24.1 mins).
- Indications included both screening and non-screening.

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Results of Network Meta-Analysis for SADR

- The analysis showed an increase in SADR compared to high definition when using WBT colonoscopy (RR: 1.41, 95% CI: 1.00–1.99*), add-on devices (RR: 1.58, 95% CI: 1.13–2.22), NBI™ technology (RR: 1.92, 95% CI: 1.11–3.35) and ECV™ Device (RR: 1.88, 95% CI: 1.11–3.19). Additional, SADR was also noted with dye-based chromoendoscopy (RR: 1.74, 95% CI: 1.03–2.93) when compared with high-definition colonoscopy. *(Table 1)*
- For individual interventions, the frequentist approach yielded the following ranking (in decreasing order): NBI technology (0.74) > ECV Device (0.73) > chromoendoscopy (0.67) > ECU (0.64) > AEYE (0.60) > FUSE (0.56) > water immersion (0.53) > water exchange (0.49) > endorings (0.47) > ECA (0.46) > ColoWrap (0.42) > chromoendoscopy + water immersion/infusion (0.36) > highdefinition (0.18) > LCI™ mode (0.16).

* Risk ratio and confidence interval > 1 indicates improved detection and <1 indicates poor detection.

Note

- This study is the largest systematic review and network meta-analysis to date to focus on the assessment of SADR and to comprehensively evaluate the effectiveness of different intervention methods at once.
- Authors reported that the overall certainty of the evidence based on GRADE approach was LOW. The evidence was rated low due to high risk of bias in each RCT (mainly due to impractical blinding of the endoscopists) and the possibility of confounding bias as not all studies included patients based on screening and surveillance indication.
- This study has the following limitations:
  - The number of RCTs for each individual modality were low and not all RCTs reported SADR.
  - All included RCTs were at high risk for subjective bias due to unblinded colonoscopy performed by endoscopists for practical reasons.
  - Study heterogeneity, differences in population undergoing colonoscopy, study indication and geographical distribution can lead to misinterpretation of the results.

Table 1. Results of Network Meta-analysis Comparing NBI Technology, ECV Device, WBT to HD Colonoscopy

Individual intervention	Risk Ratio with 95% Confidence Interval for Improving SADR* vs High-definition Colonoscopy
NBI Technology	1.92 (1.11–3.35)
ECV Device	1.88 (1.11–3.19)
WBT	1.41 (1.00–1.99)

* Risk ratio and confidence interval > 1 indicates improved detection and <1 indicates poor detection.

- HCPs performing colonoscopies were 1.92 times more likely to find at least one Serrated adenoma per colonoscopy when using NBI technology compared to HD white light.
- HCPs performing colonoscopies were 1.88 times more likely to find at least one Serrated adenoma per colonoscopy when using ECV device compared to HD white light.

Note: NBI™ technology is not intended to replace histopathology as means of diagnosis.

Note: HCPs performing colonoscopies were 1.41 times more likely to find at least one Serrated adenoma per colonoscopy when using WBT compared to HD white light.

For More Information on Narrow Band Imaging™ Technology Scan or Click the QR Code

For More Information on ENDOCUFF VISION™ Device Scan or Click the QR Code

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