

Impact of cuff-assisted colonoscopy for adenoma detection

A protocol of systematic review and meta-analysis

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Abstract

Background: Previous studies have reported that cuff-assisted colonoscopy (CAC) can be used for detection of adenoma (DA). However, there are inconsistent results regarding the CAC for DA. Thus, this study will systematically explore the impact of CAC for DA.

Methods: In order to retrieve potential eligible articles, this study will identify the following electronic databases from their inception to present: MEDLINE, EMBASE, Cochrane Library, PSYCINFO, Web of Science, Chinese Biomedical Literature Database, and China National Knowledge Infrastructure. All electronic databases will be searched without any language limitation. We will consider case-controlled studies that focused on exploring the impacts of CAC for DA. Two authors will perform study selection, information collection and risk of bias assessment, respectively. Any discrepancies between 2 authors will be resolved through discussion with a third author.

Results: This study will summarize the most recent evidence to assess the impact of CAC for DA.

Conclusion: The findings of this study will provide evidence of CAC for DA in clinical practice.

Systematic review registration: INPLASY202040042.

Abbreviations: CAC = cuff-assisted colonoscopy, CCSs = case-controlled studies, CIs = confidence intervals, DA = detection of adenoma.

Keywords: adenoma detection, cuff-assisted colonoscopy, impact

1. Introduction

Colorectal cancer is one of the most common cancers,^[1–5] which is also the leading cause of death around the world.^[6,7] Previous study has reported that adenocarcinoma accounts for more than 95% of malignant tumors.^[8,9] Thus, it is very important to detect adenoma at early stage.^[10–12] Detection of adenoma (DA) rate is an essential quality indicator during colonoscopy,^[13–16] which is also associated with colorectal cancer incidence and subsequent death.^[17]

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A variety of studies have found that cuff-assisted colonoscopy (CAC) can be used for DA.^[18–20] However, no systematic review has been conducted to check the impact of CAC for DA. Therefore, this study will investigate the impact of CAC for DA.

2. Methods

2.1. Study registration

We have registered this study on INPLASY202040042, and we report it according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) Protocol statement guidelines.^[21]

2.2. Eligibility criteria

2.2.1. Type of studies. We will include case-controlled studies (CCSs) reporting the impacts of CAC for DA. All experimental studies, case studies, non-clinical studies, and non-controlled studies will be excluded.

2.2.2. Type of participants. Any patients who were diagnosed with histological-proven adenoma will be included in this study without restrictions of race, age, sex, and country.

2.2.3. Type of indexes. Experimental group: All participants received CAC for DA.

Control group: All participants underwent detection of histological-proven adenoma, but not CAC.

2.2.4. Type of outcome measurements. The primary outcome measurements are sensitivity and specificity. The secondary

outcome measurements are diagnostic odds ratio, adenoma detection rate, the number of diagnosed adenomas, polyp detection rate, and cecal intubation rate.

2.3. Data sources and search strategy

2.3.1. *Electronic searches.* The following electronic databases will be searched in MEDLINE, EMBASE, Cochrane Library, PSYCINFO, Web of Science, Chinese Biomedical Literature Database, and China National Knowledge Infrastructure from their inceptions to the present. We will not apply any language and publication status limitations to the above electronic databases. All CCSs that focused on exploring the impacts of CAC for DA will be considered. A search strategy has been developed for MEDLINE (Table 1). We will also amend similar strategies for use in other databases.

2.3.2. *Other resources.* We will also search grey records, such as dissertations, conference abstracts, and reference list of relevant reviews.

2.4. Data collection and analysis

2.4.1. *Selection of studies.* All searched records will be entered into Endnote 7.0 software, and all duplicated studies will be removed automatically and manually. Two authors will independently check titles and abstracts of all retrieved literatures to evaluate eligibility for inclusion. After initial selection, full papers of potential studies will be further obtained to check eligibility for inclusion. The process of study identification will be presented in a flowchart. Any different opinions between 2 authors will be solved through consultation with the help of a third author.

2.4.2. *Data extraction.* Two authors will independently extract data from each included study using predefined data collection sheet. The extracted information includes first author, publication time, study characteristics, patient characteristics, study design, study setting, study methods, details of indexes, outcome measurements, and any other relevant information. Any

disagreements will be solved by a third author through discussion. If relevant essential information cannot be retrieved from the included articles, primary authors will be contacted to request it.

2.5. Study quality assessment

To determine the methodological quality for the included studies, Quality Assessment of Diagnostic Accuracy Studies tool^[22] will be used for CCSs. Two authors will independently evaluate the methodological quality for all included study. Any disagreements regarding study quality assessment between two authors will be resolved by consultation with a third author.

2.6. Statistical analysis

RevMan V.5.3 software will be used for data analysis in this study. All outcome data will be calculated as descriptive statistics or risk ratio and 95% confidence intervals. Whenever necessary, we will also perform a descriptive forest plot and a summary receiver operating characteristic. The degree of heterogeneity across eligible studies will be identified using I^2 statistic. $I^2 \leq 50\%$ means low heterogeneity, while $I^2 > 50\%$ means significant heterogeneity. If there is low heterogeneity, we will use a fixed-effects model and will carry out meta-analysis. If there is significant heterogeneity, we will use a random-effect model, and will perform subgroup analysis. If we can still detect substantial heterogeneity after subgroup analysis, we will conduct narrative summary to synthesize outcome data.

2.7. Subgroup analysis

We will perform subgroup analysis based on the different characteristics of study and patient, index types, and outcomes.

2.8. Sensitivity analysis

We will carry out sensitivity analysis to check robustness of pooled results by removing low quality studies.

2.9. Reporting bias

We will perform funnel plots to check any potential reporting bias when more than 10 studies are included.^[23]

2.10. Ethics and dissemination

This study does not need formal ethical assessment or informed consent, because it will not analyze individual patient data. The findings of this study will be published on a peer-reviewed journal.

3. Discussion

Previous studies have reported that CAC can be used for DA. However, no systematic review has been conducted to test the impact of CAC for DA. This systematic review will firstly and systematically examine the impact of CAC for DA by evaluating sensitivity, specificity, diagnostic odds ratio, adenoma detection rate, the number of diagnosed adenomas, polyp detection rate, and cecal intubation rate. The results of this study may present a summary of the most recent evidence of CAC for DA, which may provide recommendation for both clinicians and future associated studies.

Table 1	
Detailed search strategy of MEDLINE.	
Number	Search terms
1	Adenoma detection
2	Adenomas
3	Adenomate
4	Tumor
5	Detection
6	Diagnosis
7	Test
8	Examine
9	Identification
10	Or 1–9
11	Colonoscopy
12	Coloscopy
13	Endoscopic examination
14	Cuff-assisted
15	Or 11-14
16	Case-controlled studies
17	Controlled study
18	Case study
19	Observational study
20	Or 16-19
21	10 and 15 and 20

Author contributions

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