

Routine colonoscopy after left-sided acute uncomplicated diverticulitis: a systematic review (CME)

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The use of routine colonoscopy after an episode of acute diverticulitis (AD) remains a point of debate. Most international and clinical practice guidelines advise endoscopy after conservatively treated diverticulitis.¹⁻⁶ The rationale has always been to exclude an underlying malignancy or advanced colonic neoplasia (ACN). However, this is based merely on expert opinion. A recent article indicated that presently this may be different with increased use of abdominal CT imaging of diverticulitis.⁷ Furthermore, the yield of colonoscopy in patients after an episode of AD also casts doubt on current international practice.⁸⁻²⁰

Routine colonoscopy after an uncomplicated episode of diverticulitis dates from a time where the diagnosis was primarily based on clinical examination and laboratory results with frequent use of barium enema.²¹ However, in today's clinical practice, CT is widely used for the diagnosis of diverticulitis, with the possibility to assess potential adverse events such as abscess, fistula, obstruction, or perforation as well. Because of high sensitivity of 94%, a specificity of 99%, and a low interobserver variability, this modality is currently preferred for the diagnosis of diverticulitis, although US also has a good sensitivity.^{22,23} Nevertheless, it remains uncertain if the prevalence of colorectal carcinoma (CRC) and advanced adenoma (AA) in patients with imaging-proven diverticulitis is higher than in an average-risk population. Apart from diagnosing CRC, the detection of AA is of great importance because it bears the potential to progress to carcinoma.

Colonoscopy is accompanied by such disadvantages as invasiveness and discomfort, potential adverse events such as perforation, and additional costs. It is important

to know what the yield of routine colonoscopy is after a confident diagnosis of AD (ie, is there a justified indication?) Therefore, the aim of this systematic review was to determine the pooled prevalence of ACN, thus CRC and/or AA, as detected with colonoscopy in patients after an imaging-proven diagnosis of AD.

METHODS

Review protocol and study eligibility

A review protocol, for which the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist²⁴ served as a guideline, was used by 2 authors (L.D. and C.U.) for the execution of this systematic review.

Eligibility criteria. *Definitions.* Diverticulitis is complicated diverticular disease with clinical symptoms and evidence of inflammation, confirmed by US or CT imaging. ACN comprises AA and/or CRC. An AA is defined as an adenoma ≥ 10 mm, $\geq 25\%$ villous features (also classified as tubulovillous or villous histology), or with high-grade dysplasia.²⁵ Right-sided is defined as proximal to the splenic flexure.

Types of studies. There were no predetermined limits of design types or language. Articles were eligible for inclusion when the following criteria were met: studies dealing with follow-up colonoscopy after US- or CT-proven left-sided diverticulitis, human studies, and studies of which the full text and data were available. The following exclusion criteria were used for study selection: studies without follow-up colonoscopy but with CT-colonography or contrast barium enemas instead or with outcome based on surgically obtained pathology specimens.

Types of participants. Patients aged 18 years or older with a recent diagnosis of uncomplicated AD were included. This diagnosis had to be confirmed by US and/or CT imaging.

Types of outcome measures. Primary outcome measure was the detection of ACN: AA and/or CRC. Secondary outcomes were detection of adenomas and serrated polyps (hyperplastic, sessile serrated adenoma/polyp, and traditional serrated adenoma). Adverse events of colonoscopy were also registered if described.

Abbreviations: AA, advanced adenoma; ACN, advanced colonic neoplasia; AD, acute diverticulitis; ADR, adenoma detection rate; CRC, colorectal carcinoma.

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Literature search

An electronic literature search was performed to identify relevant records. The MEDLINE database was searched for articles published between January 1966 and July 2013, with the following search strategy: (((“Diverticulitis”[Mesh] OR “diverticulitis”[All Fields]) AND (“Colonoscopy”[Mesh] OR “Colonoscopy”[All Fields] OR “Colonography, Computed Tomographic”[Mesh])) AND (“1966/01/01”[Date - Publication] : “3000”[Date - Publication])). Free text words were also used instead of MeSH terms to avoid missing recent articles that had not yet been given a MeSH label. EMBASE database was searched for records published between 1974 and July 2013 with the following terms: diverticulitis and colonoscopy. The CINAHL database was also checked with the same key words. In addition, the Cochrane database of Systematic Reviews was searched with the following words: diverticular disease.

Selection

After removal of duplicate records, 2 reviewers screened the initial literature search based on title and abstract. After identifying potentially relevant records, the full-text articles of these were retrieved. Additionally, a manual cross-reference search of the reference lists of relevant articles was performed, and electronic links to related articles were hand searched as well to identify other studies not found in the initial search. They were all assessed for eligibility by applying the inclusion and exclusion criteria. Articles that reported on (parts of) the same study population were excluded from the review.

Data extraction

Data from each included study were extracted by 2 reviewers independently using a standard form. These data included authors, year of publication, country, study design, inclusion period, type of patients, type of imaging for the diagnosis of AD, definition used for AD and ACN/AA, interval between diagnosis AD and colonoscopy, study endpoints, follow-up period, number of patients, patient age, number of complete colonoscopies, number of adverse events, number of patients with neoplastic lesions, number of (patients with) polyps, number of (patients with) adenomas (including AA), number of (patients with) AA, number of (patients with) CRC, number of (patients with) ACN, localization of ACN, age at diagnosis ACN, and any additional relevant information.

Assessment of susceptibility to bias

Two reviewers independently assessed the methodologic quality of the studies and susceptibility to bias using the MINORS quality score, an instrument designed to assess the methodologic quality of nonrandomized surgical studies, with a global ideal score of 16 for noncomparative studies.²⁶

Statistical analysis

The primary outcome of this systematic review was the percentage of patients with ACN, and thus CRC and/or AA, as detected with follow-up colonoscopy, after an episode of imaging-proven diverticulitis. Therefore, for each included study, we calculated the 95% confidence intervals (CIs) around the proportions of ACN, CRC, and AA. We calculated the estimated pooled prevalence and 95% CIs based on a random effects model using Meta-Analyst version Beta 3.13 (Tufts Medical Center, Boston, MA, USA). We determined the presence of heterogeneity between the studies by using a forest plot and by performing a χ^2 heterogeneity test, and the I^2 index was calculated. To assess publication bias, we performed a funnel plot asymmetry test by using Meta-Analyst version Beta 3.13 as well.

RESULTS

Study selection

A total of 959 records was initially identified in the literature search (Fig. 1). Of these, 234 records were excluded because they were duplicate articles. From the 725 remaining records, screened based on title and abstract, another 694 were excluded because of irrelevance. Most studies were irrelevant because they covered other subjects, among others performance and findings of CT-colonography, screening colonoscopy, comparison of standard colonoscopy versus colonoscopy with transparent cap, management of diverticulitis, and sigmoidovesical fistula. Thirty-one full-text articles were retrieved for more detailed examination; 1 additional article was found in reference lists. These were assessed for eligibility. The application of our inclusion and exclusion criteria resulted in 8 relevant studies. Twenty-three articles were excluded because they were abstracts only, case report, contained duplicate data, or failed to meet our inclusion criteria. The 2 reviewers completely agreed on inclusion of studies.

Study characteristics and risk of bias

Eight studies met our inclusion criteria and were reviewed (Table 1).⁸⁻¹⁵ The studies were executed on 4 different continents within the time frame 2000 to 2010. All studies were retrospective cohort studies, except for the studies of Chabok et al⁹ and Lahat et al.¹⁵ They compared acceptance and diagnostic accuracy of CT-colonography versus colonoscopy and early versus late colonoscopy respectively. Many of these retrospective cohort studies attempted an indirect comparison with published data on high- and average-risk asymptomatic individuals derived from screening studies.²⁷ Lau et al¹⁴ compared their CRC rate with that published by the WA Cancer Registry for all Western Australians; however, these data were not based on population colonoscopic screening.²⁸

In all studies, the diagnosis of AD was imaging proven: CT proven in 6 studies, US and/or CT proven in 1,¹⁰ and US

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