



Review

Evaluating the scientific basis of quality indicators in colorectal cancer care: A systematic review



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Received 3 April 2017; received in revised form 22 August 2017; accepted 30 August 2017

KEYWORDS

Quality of health care;
Quality indicator;
Outcome measures;
Process measures;
Evidence-based
medicine;
Colorectal neoplasms;
Systematic review

Abstract *Aim:* In colorectal cancer care, many indicators for assessment and improvement of quality of care are being used. These quality indicators serve as national and international benchmarks to compare health care on hospital and patient level. However, the scientific basis of these indicators is often unclear. Therefore, the aim of this systematic review is to examine reported quality indicators used in multidisciplinary colorectal cancer care and categorise these indicators based on scientific evidence.

Methods: We searched PubMed from 2005 to 2015 for original articles reporting on development, evaluation or validation of quality indicators in colorectal cancer care. Included articles were categorised in consensus-based, evidence-based and validation cohort studies. Extracted quality indicators were divided into structure, process and outcome indicators and grouped per discipline(s) involved.

Results: From 1163 studies, 41 articles were included: 12 (29%) consensus-based, 7 (17%) evidence-based and 22 (54%) validation cohort studies. In total, we identified 389 reported quality indicators: consensus-based (n = 349), evidence-based (n = 7) and validation (n = 33), respectively. Of all reported indicators, 45% (n = 186) concerned surgical items. The vast majority were process indicators (n = 315; 81%) and the remaining outcome (n = 57; 15%) or structure measurements (n = 17; 4%). Only 5 indicators were reported in the majority (≥7/12 articles) of consensus-based papers and 7 indicators were successfully validated.

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Conclusions: There is an abundance of reported colorectal cancer quality indicators, of which the majority are surgical, consensus-based process measures, which have not been validated in cohort studies. There is a need for international consensus on a limited evidence-based data set of validated quality indicators, with a focus on outcome indicators.
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1. Introduction

Quality indicators are used to evaluate quality of care and act as parameters to quantify healthcare processes and outcomes. Quality indicators may serve as benchmarks by which healthcare providers, payers and policy makers can determine the quality level and variation [1]. Decisions in health care are partially based on quality indicators, like hospital caseload for the ability to treat specific oncological patients and performance-based contracting of hospitals. Indicators should preferably be based on scientific evidence, such as rigorously conducted empirical studies with convincing results about the association between the studied quality indicator and reduction in either morbidity or mortality, or improvement of quality of care [2]. Without this scientific content, assessment of clinical practice with quality indicators could lead to incorrect comparisons, interpretations and judgements.

Quality indicators are traditionally categorised in structure, process and outcome measures. Structure measures focus on attributes and facilities of health care (e.g. the availability of appropriately equipped operating rooms or constitution of multidisciplinary tumour boards), process measures on the specific steps that lead to a particular outcome metric (e.g. the performance of a complete colonoscopy before or after the surgery or radiotherapy for high-risk rectal cancer) and outcome measures focus on the effects of health care on the patient or the system (e.g. 5-year overall survival or the number of anastomotic leakages after surgery). The National Quality Forum [3], an organisation specialised in quality indicator endorsement and healthcare improvement, considers several criteria for indicator rating: importance, scientific acceptability, feasibility and usability. The scientific acceptability illustrates that a measure produces consistent (reliable) and credible (valid) results about quality of care and leads to healthcare improvement. However, there is no validated instrument available to judge quality indicators themselves, but general presumptions include a scientific content and validation of the concerned indicator. The validation of quality indicators is preferably performed in a second independent external cohort examining the association between proposed quality indicator and clinical outcome(s).

As fourth most common cause of death due to cancer worldwide (almost 700,000 cases) with an incidence rate

of 1.4 million new cases per year in 2012 [4], colorectal cancer is an area with several quality initiatives to improve survival and maintain quality of life [5,6]. Also several other quality initiatives and quality indicator reviews in other types of cancer (e.g. breast, prostate and gastric cancer) exist [7–9]. A variety of indicators are already identified and used for clinical evaluation. In 2007, a multidisciplinary systematic review about the quality metrics in colorectal cancer was conducted and the authors concluded an urgent need to refine existing measures and develop scientifically accurate quality measures for assessment [10]. Nevertheless, there is an ongoing expansion of consensus-based publications, continuously adding new quality indicators.

In the last decade, several mono-disciplinary reviews and reviews regarding quality indicators of subgroups of colorectal cancer patients have been published [11–14]. Other literature specifically focused on screening, prevention and diagnosing colorectal cancer [15,16]. No updated systematic overview of reported quality indicators covering all areas of colorectal cancer care is available, and a multidisciplinary overview with an evidence-based data set of validated quality indicators is lacking. Therefore, the aim of this systematic review is to examine reported quality indicators used in multidisciplinary colorectal cancer care during the last decade and categorise these indicators based on scientific evidence.

2. Methods

2.1. Literature search

We conducted a search in PubMed combining keywords and Medical Subject Heading (MeSH) terms about quality of care or quality indicators (Quality Improvement (MeSH) OR Quality Assurance, Health Care (MeSH) OR Quality Indicators, Health Care (MeSH) OR quality indicator [tiab]) with colorectal cancer (Colorectal Neoplasms (MeSH) OR colorectal carcinoma [tiab] OR colorectal cancer [tiab]). We restricted our search to English language original articles published between June 2005 and June 2015.

We downloaded the results of our search into EndNote software and removed the duplicates. Two reviewers (MB and LK) independently reviewed titles and abstracts, followed by full text revision, and screened for suitability according to our selection

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