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Review

Pre- and postoperative care for stage I–III NSCLC: Which quality of care indicators are evidence-based?

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ABSTRACT

Identification of evidenced-based Quality of Care (QoC) indicators for lung cancer care is essential to quality improvement. The aim of this review was to identify evidence-based quality indicators for the pre- and postoperative care of stage I–III Non Small Cell Lung Cancer (NSCLC) provided by the lung physician. To obtain these indicators, a search in PubMed, Embase and the Cochrane library database was performed. English literature published between 1980 and 2012 was included and search terms regarding 'lung neoplasms', 'quality of care', 'pathology', 'diagnostic methods', 'preoperative and postoperative treatment' were used. The potential indicators were categorized as *structure*, *process* or *outcome* measures and the indicators supported by literature with high evidence level were selected. Five QoC indicators were identified. The use of the positron emission tomography-computed tomography (PET-CT) results in more accurate mediastinal staging compared to the CT scan. Endoscopic Ultrasound-Fine Needle Aspiration and Endobronchial Ultrasound-Fine Needle Aspiration are sensitive diagnostic tools for mediastinal staging and reduce futile thoracotomies. Pathological conformation of lung cancer can best be obtained by a combination of cytological and histological diagnostics used during bronchoscopy. For patients with clinical stage III NSCLC, preoperative multimodality treatment (i.e. preoperative chemoradiation) results in superior survival and increased mediastinal downstaging compared to single modality treatment (i.e. preoperative chemotherapy or radiotherapy). After surgery, the addition of chemotherapy results in a significant survival benefit for patients with pathological stage II and III NSCLC. These five QoC indicators can be used for benchmarking and ultimately quality improvement of lung cancer care.

Contents

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1. Introduction

The pre- and postoperative management of patients with stage I–III Non Small Cell Lung Cancer (NSCLC) covers a broad area, including diagnostic procedures, staging, preoperative and postoperative treatment. Before a lung physician can start treatment, adequate staging has to be performed with subsequent collection of pathological specimens. Adequate staging results in patients being directed towards the most effective treatment, consisting of (preoperative) chemotherapy, radiotherapy or chemoradiation. Also, accurate staging results in less futile thoracotomies, consequently reducing costs [1,2].

To assess the quality of care for patients with stage I–III NSCLC, identification of evidence-based quality of care (QoC) indicators is required. Therefore, Donabedian developed a model which provides a framework for quality evaluation. In his model QoC indicators were categorized as *structure*, *process* or *outcome* measures [3]. *Structure* measures are related to the setting in which health care is provided; *process* measures refer to the diagnostic methods and/or treatment used and *outcome* measures reflect the (patient) outcomes after treatment. Although, identification of QoC indicators for lung cancer care has gained growing interest in literature, to our knowledge no systematic evaluation of evidence-based QoC indicators describing the pre- and postoperative management for patients with potential curable NSCLC has been performed [4,5].

The aim of this study was to identify evidence-based quality indicators for the pre- and postoperative management of stage I–III NSCLC.

2. Material and methods

2.1. Literature search

Initially, a search was performed covering the perioperative care for patients with stage I–III NSCLC. The search was conducted through the PubMed, Embase and Cochrane library database, by using Medical Subject Headings (MESH) terms and text words (Appendix A in Supplementary information). Search terms regarding 'lung neoplasms', 'quality of care', 'diagnostic methods', 'pathology', 'surgical treatment', 'pre- and postoperative treatment' were used, limiting our search to English literature with human subjects, published between 1980 and 2012. Finally, identical publications were removed. Due to the comprehensive nature of this topic, the articles was divided into two physician-specific topics: lung cancer care provided by the lung physician (i.e. diagnosis, staging, pre-and postoperative treatment) and treatment guided by the thoracic surgeon (i.e. (direct post)operative management). The results of the systematic evaluation on QoC indicators regarding the management of stage I–III NSCLC provided by lung physicians, is presented here.

2.2. Selection process

A Delphi technique was used to select relevant articles. Three authors (RCN, MtB, MWW) participated in the initial search, whereas two reviewers (RCN and MtB) selected relevant articles based on the title and abstract of the manuscript. The selected articles were obtained in full text and included if the manuscript described a *structure*, *process* or *outcome* measure regarding the pre-or postoperative management of patients with stage I–III NSCLC. If any disagreement regarding inclusion of studies occurred, a third reviewer (MWW) was consulted.

The exclusion criteria for this review are summarized in Supplementary Table 1. Manuscripts were excluded when incomplete case mix was presented or pathological data was missing. If manuscripts described an identical study population, the manuscript providing the most complete follow-up data was selected. To prevent studies from being included twice, the studies used in meta-analyses selected in our review, were excluded in our final database. After the final database was completed, the reference lists of the included manuscripts were hand checked to identify additional relevant articles. Systematic reviews were used to identify additional articles but were not included in our final database.

2.3. Categorization

The retrieved manuscripts were categorized based on their study design: meta-analysis, randomized controlled trial (RCT), prospective study, retrospective study. To present a transparent overview of the available literature, manuscripts with the highest level of evidence were selected; this hierarchical selection process is depicted in Fig. 1.

2.4. Evidence level

To present a list of evidence-based QoC indicators, indicators were summarized in a 2-step process. First, the available evidence was summarized within one of the four categories (meta-analysis, RCT, prospective study, retrospective study): the number of manuscripts not supporting a QoC indicator was subtracted