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Research review

Postoperative complications and implications on patient-centered outcomes

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ABSTRACT

Background: Postoperative complications increase patient morbidity and mortality and are a target for quality improvement programs. The goal of this study was to review the world's literature on postoperative complications in general surgery patients and try to examine the effect of these complications on patient-centered outcomes.

Methods: A comprehensive search of the current literature identified 18 studies on the topic of postoperative complications in general surgery patients.

Results: Postoperative complications are common in general surgery patients and contribute to increased mortality, length of stay, and need for an increased level of care at discharge (decline in disposition).

Conclusions: Although the concept of patient-centered outcomes is not new, it has not been applied to postoperative complications. It is likely that the effect of complications on length of hospital stay and postoperative discharge reflects an impact of complications on these patient-centered outcomes. Future studies should consider the effect of complications on those outcomes that are most important to the individual patient.

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1. Introduction

The number of surgical procedures performed annually in the United States continues to rise with >14 million admissions for surgical procedures reported in 2006 [1]. Many of these patients will experience postoperative complications with complication rates as high as 30% in some patient groups [2,3]. Surgical quality improvement programs are becoming more prevalent in an effort to improve surgical outcomes. The ultimate goal was to measure outcomes and identify areas for improvement in an effort to decrease patient morbidity and mortality. Payers and regulators are also interested in patient outcomes and quality improvement. Many Health

Maintenance Organizations and the Centers for Medicare and Medicaid Services use pay for performance and are now starting to withhold payment for complications deemed preventable in an effort to improve outcomes [4].

Perhaps more important to the practicing clinician than the financial impact of postoperative complications is the impact of these events on patient-centered outcomes. The concept of patient-centered outcomes is not new. In fact, the Institute of Medicine's quality chasm report defined this type of care as care that "respects the individuality, values, ethnicity, social endowments, and information needs of each patient" [5]. Although there is no standard set of patient-centered outcomes, any outcome that is important to

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patients and assists patients in medical decision making is typically considered patient centered. For example, survival, morbidity, symptoms, function, quality of life, and patient satisfaction have been described as patient-centered outcomes [6–10]. It is clear that postoperative complications will have negative effects on many issues that are most important to patients. For example, pelvic sepsis after ileal pouch surgery will likely negatively impact the patient's quality of life [11]. Although this type of complication is extreme and clearly would impact quality of life, it is less clear if other complications will similarly affect patient-centered outcomes. Therefore, we wanted to determine if the literature supports the notion that postoperative complications have negative impacts on other types of patient-centered outcomes. The aim of this article was to review the current literature related to postoperative complications and summarize their risk factors, classification systems, and their impact on patient-centered outcomes.

2. Methods

A literature search was conducted in July 2012 using the PubMed database as demonstrated in the Figure. For the purposes of this study, we considered the following as patient-centered outcomes: mortality, morbidity, quality of life, discharge disposition, and length of stay. The search included the following key words: postoperative or surgical, complications, general surgery, laparoscopic versus open, disposition, morbidity, mortality, classification, quality of life, and patient-centered outcomes. We limited our initial search to studies performed in adult humans, manuscripts written in English, and performed in the last 10 y. The terms postoperative or surgical and complications and general surgery were used in combination with the other search terms to produce an initial list of 1,074 potentially relevant studies. Abstracts of these publications were evaluated and publications were eliminated if they were not performed in general surgery patients or if they did not address the effect of complications on patient outcomes. The 26 abstracts that appeared to address the questions of this study were further analyzed. A reference review of the selected publications identified five more relevant trials. The initial search yielded 31 publications. These manuscripts were read, evaluated, and narrowed to include only publications pertaining to general surgery patients with 18 remaining publications. Characteristics of the 18 included studies are listed in Table 1.

3. Results

3.1. Classification of complications

A major limitation in the reporting of postoperative complications is that no standardized system for reporting or grading of complication severity exists. Many studies arbitrarily describe complications as “severe” or “minor,” which results in difficulty comparing outcomes across the literature. Classification of complications was first proposed in 1992 by Clavien et al. [12] in an effort to standardize reporting of postoperative complications. The initial grading system placed an emphasis on morbidity and therapeutic treatment of complications when determining the severity of complications. The grading system is presented in Table 2. In 2004, Clavien et al. [13] reevaluated and revised the classification system as depicted in Table 3. An international survey demonstrated reproducibility of the classification with accuracy of grading ranging from 87% to 93%. Greater than 90% of surgeons surveyed described the classification system as simple and reproducible.

Clavien et al. [14] again reassessed the grading system in 2009 using complex clinical situations collected from the University of Zurich weekly morbidity and mortality conferences. Surgeons from seven centers around the world evaluated the scenarios and graded the complications with >90% agreement. The authors also noted variability in how the grading system was referenced in the literature and proposed it be referred to as the “Clavien–Dindo” classification [14].

Another group has attempted to develop a classification system of complications found in the participant use file of the American College of Surgeons National Surgical Quality Improvement Project (NSQIP) [15,16]. Using the Accordion Severity Grading System, Strasberg and Hall assessed the ability of postoperative morbidity index to quantify postoperative complication severity. Each complication was graded with the Accordion System and the graded complications were weighted to yield the total severity burden of each complication. This allowed the authors to compare outcomes and stratify complications according to severity following different surgical procedures.

3.2. Incidence of postoperative complications

We found the reported incidence of 30-d postoperative complications in general surgery patients to range from 5.8% to 43.5% [2,3,15,17–19]. Two studies further classified

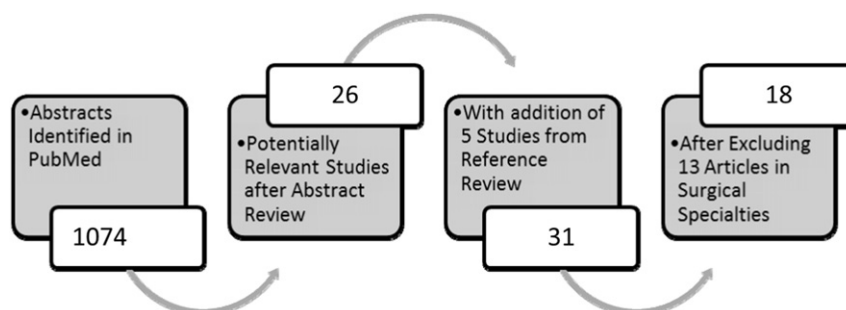


Fig. – Literature selection.

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