

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.JournalofSurgicalResearch.com

Association for Academic Surgery

Cholecystectomy and Wound Complications: Smoking Worsens Risk



Shalini Selvarajah, MD, MPH,* Ammar A. Ahmed, BSc,
Eric B. Schneider, PhD, Joseph K. Canner, MHS,
Timothy M. Pawlik, MD, MPH, PhD, Christopher J. Abularrage, MD,
Xuan Hui, MD, ScM, Diane A. Schwartz, MD, Butool Hisam, BSc,
and Adil H. Haider, MD, MPH

Center for Surgical Trials and Outcomes Research, Department of Surgery, Johns Hopkins University School of Medicine, Baltimore, Maryland

ARTICLE INFO

Article history:

Received 19 April 2014
Received in revised form
23 May 2014
Accepted 6 June 2014
Available online 13 June 2014

Keywords:

NSQIP
Cholecystectomy
Laparoscopic
Smoking
Wound complications

ABSTRACT

Background: In the United States, approximately 800,000 cholecystectomies are performed annually. We sought to determine the influence of preoperative smoking on post-cholecystectomy wound complication rates.

Materials and methods: Using the National Surgical Quality Improvement Program database (2005–2011), patients aged ≥ 18 y who underwent elective open or laparoscopic cholecystectomy (LC) for benign gallbladder disease were identified using current procedural terminology codes. Multivariate regression was performed to determine the association between smoking status and wound complications, by surgical approach.

Results: Of 143,753 identified patients, 128,692 (89.5%) underwent LC, 27,788 (19.3%) were active smokers, and 100,710 (70.2%) were females. Active smokers were younger than nonsmokers (mean + standard deviation age: 44.2 (14.9) versus 51.6 (17.9) years); $P < 0.001$ and had fewer comorbidities. Within 30-d postcholecystectomy, wound complications were reported in 2011 (1.4%) patients. Compared with nonsmokers, active smokers demonstrated increased odds of wound complications after both open cholecystectomy (odds ratio 1.28; $P = 0.010$) and LC (odds ratio 1.20; $P = 0.020$) after adjustment for demographic and clinical characteristics. Having wound complications increased the average postoperative length of stay by 2–4 d ($P < 0.001$).
Conclusions: Active smokers are more likely to develop wound complications after cholecystectomy, regardless of surgical approach. Occurrence of wound complications consequently increases postoperative length of stay. Smoking abstinence before cholecystectomy may reduce the burden associated with wound complications.

© 2014 Elsevier Inc. All rights reserved.

Presented at the Academic Surgical Congress (SUS/AAS) Annual Meeting, San Diego, CA, February 4, 2014.

* Corresponding author. Center for Surgical Trials and Outcomes Research, Department of Surgery, Johns Hopkins University School of Medicine, 600 N Wolfe St, Blalock 611, Baltimore, MD 21287. Tel.: +1 410 614 7182; fax: +1 410 955 8101.

E-mail address: sselvar2@jhmi.edu (S. Selvarajah).

0022-4804/\$ – see front matter © 2014 Elsevier Inc. All rights reserved.

<http://dx.doi.org/10.1016/j.jss.2014.06.014>

1. Introduction

Approximately 800,000 cholecystectomies are performed each year in the United States, making it the most commonly performed abdominal surgery [1]. Most of the cholecystectomies are performed for gallstone-related disease, a condition presently affecting 10%–15% of the United States adult population (approximating 20–25 million people) [2,3]. With a worsening obesity epidemic, this number is expected to rise beyond the 20% increase observed over the past 30 y. Currently, \$6 billion is expended each year to treat patients with gallstone disease in the United States [2,4].

Ever since laparoscopic removal of the gallbladder was popularized in 1989, the number of cholecystectomies performed each year has increased tremendously with a 30% escalation in the total number of cholecystectomies performed during the early 1990s in the United States [5–7].

Currently, the majority of cholecystectomies (80%) are performed laparoscopically [6,8,9]. Open cholecystectomies (OCs) instead are reserved for patients with specific contraindications for laparoscopic cholecystectomy (LC) or where open conversions were necessitated intraoperatively due to technical challenges [10,11].

Surgical site infection (SSI) rates after LC were reported to be 0.62% between 1992 and 1999 compared with 1.82% after OC [12]. Although wound complication rates may appear to be relatively low as compared with other surgical procedures, the absolute number of wound complications occurring may not in fact be falling because of the increase in the number of procedures being performed [8]. It is therefore crucial to explore current complication rates, and identify potential modifiable risk factors that could be addressed to enhance patient outcomes. An important and well-established modifiable risk factor for poor surgical outcomes is cigarette smoking [13]. Smoking continues to be a public health problem, with almost a fifth of the United States adult population reported to be current smokers [14]. Several studies have shown the harmful association between cigarette smoking and wound healing potential and SSI risk [15–17].

However, the relationship between smoking and wound complications has not been described among patients undergoing OC or LC.

In this study, we sought to evaluate the magnitude and influence of preoperative active smoking on the occurrence of 30-d wound complications after both OC and, LC using a robust, national surgical database.

2. Materials and methods

2.1. Study design and setting

A retrospective review of prospectively collected data from the National Surgical Quality Improvement Program (NSQIP) from 2005–2011 was conducted [18]. Currently, more than 400 US-based hospitals voluntarily contribute to this nationally validated, risk-adjusted database. Surgical case reviewers in participating hospitals collect data on 135 variables for systematically sampled adult patients undergoing major surgery

and enter these information, which include preoperative risk factors, intraoperative details, and 30-d postoperative complications into a standardized, web-based data collection program on the American College of Surgeons website. Complete and updated information describing NSQIP, its sampling methodology and program implementation have been published extensively elsewhere [18,19]. The Institutional Review Board of Johns Hopkins Hospital approved this study.

2.2. Study population

The study population comprised all patients aged ≥ 18 y who had undergone elective OC (Current Procedural Terminology [CPT]:47600 and 47620) or LC (CPT:47562 and 47564) identified using CPT codes recorded as the principal procedure. Cases with a concomitant primary postoperative diagnosis of malignant neoplasms (140.0–239.9) or postcholecystectomy syndrome (576.0) identified using International Classification of Diseases-9 diagnosis codes were excluded. Additionally, open conversions and cases with missing data for age, sex, race, smoking status, comorbidities, operative time, and wound complications ($< 1\%$ of the initial population) were excluded to form the final cohort for analysis.

2.3. Data collection

Variables included in this study include demographic factors such as age, sex, and race. Four major categories for race and ethnicity were used: Whites, Blacks, Hispanics, and other.

Body mass index (BMI) was calculated; patients with a BMI of ≥ 30 kg/m² were classified as obese. As defined by NSQIP, active smokers comprised patients who had smoked cigarettes within 1 y leading up to the surgery, whereas more than moderate alcohol consumption was defined as having > 2 drinks/d within 2 wk from the day of surgery [20]. Non-active smokers in this study population comprised persons who were never smokers as well as past smokers. In subsequent portions of this article, non-active smokers were termed as nonsmokers.

Comorbidities such as hypertension, diabetes, previous cardiac surgery/percutaneous coronary intervention (PCG or PCI), peripheral vascular disease (PVD), chronic obstructive pulmonary disease (COPD), and end-stage renal disease requiring dialysis (ESRD), as well as preoperative wound infection and functional status were among preoperative risk factors that were examined in this study. Preoperative laboratory investigation results that were evaluated include total white blood cell count (TWBC), hematocrit (HCT), serum bilirubin, alkaline phosphatase (ALP), and albumin level. Abnormal laboratory values were defined as follows: high HCT levels ($> 50.3\%$ in male and $> 44.3\%$ in female), leucocytosis (TWBC $> 11.0 \times 10^9/L$), hyperbilirubinemia (> 1.0 mg/dL), elevated ALP (> 147 IU/L) and hypoalbuminemia (< 3.4 g/dL). However, because these tests are not always indicated before cholecystectomy, there were a significant number of missing values (up to 25% for certain parameters). As patients with no reported laboratory results are likely to be healthy and did not need these preoperative assessments, missing laboratory values were retained to form a distinct “missing data” category in the analysis.

Download English Version:

<https://daneshyari.com/en/article/4300062>

Download Persian Version:

<https://daneshyari.com/article/4300062>

[Daneshyari.com](https://daneshyari.com)