

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.JournalofSurgicalResearch.com

Pediatric laparoscopic appendectomy, risk factors, and costs associated with nationwide readmissions



Jessica L. Buicko, MD, Joshua Parreco, MD, Samantha N. Abel, BS,
Michael A. Lopez, DO, Juan E. Sola, MD, and Eduardo A. Perez, MD*

Division of Pediatric Surgery, DeWitt-Daughtry Family Department of Surgery, Leonard M. Miller School of Medicine,
University of Miami, Miami, Florida

ARTICLE INFO

Article history:

Received 13 November 2016
Received in revised form
9 March 2017
Accepted 11 April 2017
Available online 20 April 2017

Keywords:

Appendicitis
Pediatric surgery
Readmissions
Quality improvement

ABSTRACT

Background: Previous studies of readmission after pediatric laparoscopic appendectomy have been limited to individual hospitals or noncompeting public pediatric hospitals. The purpose of this study was to evaluate the risk factors and costs associated with nonelective, 30-d readmissions in pediatric patients nationwide across public and private hospitals.

Materials and methods: The Nationwide Readmission Database for 2013 was queried for all patients under the age of 18 y with a diagnosis of acute appendicitis undergoing laparoscopic appendectomy. Using multivariate logistic regression with 26 different variables, the odds ratios (ORs) for nonelective readmissions within 30 d were determined. The costs of readmission were calculated as well as the most common diagnoses on readmission.

Results: In 2013, there were 12,730 patients under the age of 18 y undergoing laparoscopic appendectomy, and 3.4% were readmitted within 30 d. The overall mean age was 11.6 ± 3.8 y, and the mean age of the readmitted patients was 10.7 ± 4.0 whereas the mean age of patients not readmitted was 11.6 ± 3.8 ($P < 0.01$, 95% CI: 0.54–1.26). The total cost of readmissions was \$3,645,502 with a weighted nationwide estimated cost of \$10,351,690. The mean readmission cost was $\$8304 \pm 7864$. The most common diagnosis group on readmission was postoperative, posttraumatic, other device infections (36.0%), whereas the most common principal diagnosis was other postoperative infection (38.5%) and the most common secondary diagnosis was peritoneal abscess (11.9%).

Conclusions: Readmission within 30 d after laparoscopic appendectomy in pediatric patients represents a significant resource burden. This study elucidates the patient characteristics that predispose these patients to readmission. Efforts to reduce these readmissions should be focused around preventing infections in patients with these predisposing risk factors.

© 2017 Elsevier Inc. All rights reserved.

* Corresponding author. Division of Pediatric Surgery, DeWitt-Daughtry Family Department of Surgery, Leonard M. Miller School of Medicine, University of Miami, 1120 NW 14th Street, Suite 450K, Miami, FL 33136. Tel.: +1 305 243 5072; fax: +1 305 243 5731.

E-mail address: pereze@rocketmail.com (E.A. Perez).
0022-4804/\$ – see front matter © 2017 Elsevier Inc. All rights reserved.
<http://dx.doi.org/10.1016/j.jss.2017.04.005>

Introduction

Postoperative outcomes and readmission rates are being increasingly used as hospital quality metrics. Reducing hospital-readmission rates can impact both patient care and lower overall hospital costs. Almost 20% of Medicare patients are readmitted within 30 d of discharge.¹ There has been significant research in the adult population in regards to readmission statistics, and there is now a growing interest in pediatric readmissions.^{2,3} In the pediatric population specifically, general risk factors for readmission include Medicaid insurance use, black race, and presence of a complex chronic health condition.⁴

Acute appendicitis is the most common surgical emergency in children.⁵ There are over 80,000 appendectomies performed annually in patients under the age of 18.^{6,7} The incidence of acute appendicitis varies per age group ranging from one to six per 10,000 children annually under 4 y of age to 19 to 28 per 10,000 children under the age of 14.^{8,9} It has been reported that hospital charges associated with appendicitis amount to over three billion dollars annually in the United States.¹⁰

The readmission rate after appendectomy has been estimated between 1% and 19%.^{6,11,12} Most reports of clinical outcomes of appendicitis in children are from single institutions.¹³ Previous studies of readmission after pediatric laparoscopic appendectomy have been largely limited to individual hospitals or noncompeting public pediatric hospitals.

Some variability of the definite readmission rate post-appendectomy is due to the varying definitions of readmission. Some studies report any postoperative hospital encounter whereas others report only surgical-related hospital readmissions.^{6,14} Short *et al.* report an all-cause 30-d readmission rate after pediatric appendectomy of 3.4% but after excluding those patients admitted for reasons unrelated to the index appendectomy, the readmission rate dropped to 2.9%.⁶

The purpose of this study was to evaluate the risk factors and costs associated with nonelective, 30-d readmissions in pediatric patients nationwide across public and private hospitals. In light of the high incidence of the disease and frequency of readmission, identifying the patients at higher risk of readmission may help decrease total costs and improve quality of patient care.

Material and methods

The Nationwide Readmission Database (NRD) for 2013 was queried for all patients under the age of 18 y with a diagnosis of acute appendicitis, who underwent laparoscopic appendectomy. These patients were found by using the International Classification of Disease ninth (ICD9) Revision, Clinical Modification diagnosis (540.0, 540.1, and 540.9) and procedure codes (47.01). The NRD from 2013 was released in late 2015 by the Agency for Healthcare Research and Quality (AHRQ) as a part of their Healthcare Cost and Utilization Project (HCUP). The NRD contains data from approximately 14 million discharges each year unweighted. The NRD has discharge data

from 21 geographically dispersed States, accounting for 49.1% of all United States hospitalizations.¹⁵

Hospital readmission was defined as any nonelective hospital admission within 30 d after discharge from hospital in the same state in which the laparoscopic appendectomy was performed (index admission). The mean age of the patients was determined, and the mean age of the readmitted and nonreadmitted patients was compared using Student *t*-test. The NRD assigns a single All Patient Refined Diagnosis Related Groups (APRDRG) to each admission as well as a single principal ICD9 diagnosis code. Each admission also contains up to 24 secondary ICD9 diagnoses. The most common APRDRGs on readmission were calculated as well as the most common principal and secondary ICD9 diagnoses.

The NRD provides Elixhauser comorbidities that are generated from ICD9 codes using software developed by HCUP. These comorbidities were quantified as well as the other patient and hospital characteristics provided by the NRD. Multivariate logistic regression was implemented using the Enter method with readmission as the dependent variable and the covariates were all the comorbidities, patient, and hospital characteristics that had readmissions. Variables that did not have any readmitted patients were excluded from the regression. Variables that had fewer than ten patients who underwent laparoscopic appendectomy were excluded from the regression to eliminate bias. The odds ratios (ORs) for nonelective readmission within 30-d were determined. The total cost of readmissions was calculated with the mean cost of readmission as well as the nationwide weighted total cost.

Statistical analysis was performed using IBM SPSS Statistics, version 24 (International Business Machines Corp, Armonk, New York). Statistical significance was determined by a *P* value < 0.05.

Results

We identified 12,730 patients aged less than 18 y of age, who underwent laparoscopic appendectomy in 2013. The rate of readmission within 30 d was 3.4%, and 7.3% of those patients were readmitted to a different hospital from the index admission. The overall mean age was 11.6 ± 3.8 y, and the mean age of the readmitted patients was 10.7 ± 4.0 whereas the mean age of patients not readmitted was 11.6 ± 3.8 ($P < 0.01$, 95% CI 0.54 to 1.26).

The majority of patients were male (60.6%) and 2948 (23.2%) patients had perforated appendicitis. The initial length of stay was over 7 d in 5.7% of patients, and the majority of cases were performed at metropolitan teaching hospitals (62.6%). Further distribution of patients by demographic characteristics can be seen in [Table 1](#).

The total cost of readmissions was \$3,645,502 with a weighted nationwide estimated cost of \$10,351,690. The mean readmission cost was $\$8304 \pm 7864$.

The results of multivariate logistic regression for readmission are shown in [Table 2](#). Factors found to be significant predictors of readmission after laparoscopic appendectomy within 30 d included perforation, aged less than 13 y, initial

Download English Version:

<https://daneshyari.com/en/article/5733743>

Download Persian Version:

<https://daneshyari.com/article/5733743>

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