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Correlation of payor status and pediatric transfer for acute appendicitis

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ABSTRACT

Background: Tertiary referral centers provide specialty and critical care for patients presenting to hospitals that lack these resources. There is a notion among tertiary centers that outside hospitals are more likely to transfer uninsured or underinsured patients. We examined funding status of patients transferred to our tertiary pediatric hospital for surgical management of appendicitis, hypothesizing that transferred patients were more likely to have unfavorable coverage.

Materials and methods: The electronic medical record was queried for all cases of laparoscopic appendectomy at our hospital between 2011 and 2015. Insurance was grouped into three categories: commercial, Medicaid/Children's Health Insurance Plan, or none. Transferred patients were compared to patients who presented directly.

Results: A total of 5758 patients underwent laparoscopic appendectomy during the study period, of which 1683 (29.2%) were transfer patients. Transfer patients were more likely to be older, with a median age of 10.5 y versus 9.8 y in nontransferred patients ($P \leq 0.0001$), and were more likely to be identified as non-Hispanic (50.0% versus 36.5%; $P \leq 0.0001$). Insurance coverage was similar between groups. However, subgroup analysis of the hospitals that most frequently used our transfer services revealed a trend to transfer a higher proportion of Medicaid/Children's Health Insurance Plan patients.

Conclusions: Overall, pediatric patients transferred for laparoscopic appendectomy had similar insurance coverage to patients admitted directly, but subgroup analysis shows that not all centers follow this trend. Transfer patients were more frequently older and non-Hispanic. This builds upon the existing literature regarding the correlation of funding and transfer practices and highlights the need for additional research in this area.

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Ethics statement: This study was approved by an institutional review board and carried out in compliance with ethical standards for clinical research. Informed consent was deemed not needed by our IRB because of the retrospective nature of this study and the large number of patients. All patient information was deidentified.

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Introduction

Tertiary care hospitals serve an important function in modern health care, providing specialty and critical care for patients presenting to facilities with limited resources. Tertiary centers often serve as the destination for patients transferred under the Emergency Medical Treatment and Active Labor Act (EMTALA), which codifies current transfer practices in the United States. The law requires emergency department physicians to evaluate and stabilize all patients, regardless of patients' ability to pay. In addition, hospitals must provide indicated specialty care or arrange for transfer to a tertiary center if unavailable.^{1,2} This law was enacted in 1986 to decrease "patient dumping," a practice in which the uninsured were transferred to safety-net hospitals without proper stabilization or evaluation, which resulted in delayed treatment and increased mortality.^{3,4}

While its provisions strive to combat discriminatory care, transfer practices and criteria are poorly defined under EMTALA and may allow misuse of the law.^{5,6} Highlighting these concerns, data suggest that children and adults with unfavorable insurance status are more likely to be transferred to tertiary and safety-net hospitals.⁷⁻¹³ However, not all studies agree with these findings.¹⁴⁻¹⁷ Beyond the interplay of transfer and insurance coverage, outcomes and transfer are also related, with studies showing that acceptance of transfer patients can negatively affect outcome measures of hospitals.¹⁸⁻²⁴

Our institution is a pediatric tertiary care facility that routinely accepts transfers for trauma and surgical emergencies. In light of conflicting data from other institutions, we aimed to evaluate surgical transfer practices in our region. The purpose of this study was to characterize local transfers for children with a common surgical disease, acute appendicitis, to clarify how insurance coverage affects decision to transfer.

Materials and methods

Hospital and surgical practices

Children's Health is a large, academic, tertiary hospital (private, not for profit) in Dallas, Texas, that serves as a specialty center and safety net for North Texas. We routinely accept surgical transfers and rarely deny transfer requests. There are two other large pediatric hospitals in the area that accept transfers, one of which is private and the other of which is in the neighboring city of Fort Worth. We perform approximately 1300 appendectomies yearly. The laparoscopic technique is a standard practice, with open surgery reserved for when the minimally invasive technique is not possible. All patients receive parenteral antibiotics preoperatively. Appendicitis cases are booked from emergency department visits and from transfer of patients from local facilities who have made the presumed diagnosis and sent the child for definitive surgical care. We chose to study transfers for appendicitis because of the large volume of patients that we treat with this diagnosis. This study was approved by an institutional review board

(IRB number STU 102016-016) and carried out in compliance with ethical standards for clinical research. The requirement to obtain consent was waived by our IRB.

Patients and variables

The electronic medical record was queried for all cases of laparoscopic appendectomy performed at Children's Medical Center between January 2011 and December 2015. No patients were excluded from the study. Data retrieved for each patient included transfer status, originating facility, age, sex, race, ethnicity, insurance coverage, and final diagnosis. Coverage was categorized as commercial, Medicaid or Children's Health Insurance Plan (CHIP), or none (self-pay).

Power calculation

We powered this study based on the rate of uninsured children in the United States, which is approximately 5%.²⁵ To detect at least a 3% difference in the uninsured rate for non-transferred and transferred patients, we calculated a needed sample size of 3125 patients in total. This accounts for 80% power and a significance level of $P < 0.05$. We included all patients between 2011 and 2015, which totaled 5758 patients and powered this study appropriately.

Data analysis

Patients were divided into two groups based on transfer status. Transferred patients were compared to those who presented directly to our hospital. Subgroup analysis was completed based on originating facility by identifying the top five hospitals that transferred the most patients during the study period. These five hospitals were chosen because each transferred patients at higher rates and sent a relatively major subset of patients. Other centers transferred similar numbers of patients at lower rates. This characteristic is what led us to identify top five "heavy utilizers" of transfer. Patients from these five hospitals were compared to those who directly presented. The remaining patients from hospitals who less frequently transferred patients for appendicitis were grouped together and also compared to direct presentation patients. Descriptive and comparative statistics were performed using GraphPad Prism, version 7.00, for Windows, (GraphPad Software, La Jolla, CA; www.graphpad.com) and IBM SPSS Statistics, version 22.0, for Windows, (IBM Corp, Armonk, NY). Unpaired t-tests were used to compare means, and chi-square tests were used to compare categorical data. A P value of <0.05 was considered significant. Factorial analysis of variance was performed to determine interactive effects of multiple variables on transfer status.

Results

From January 2011 to December 2015, a total of 5758 patients underwent laparoscopic appendectomy at our institution (Table 1). Of these, 1683 patients were transferred from outside facilities (29.2%). We found that transfer patients were

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