Journal of Pediatric Urology (2014) 10, 724—729

Journal of Pediatric urology

Variation in use of nephron-sparing surgery among children with renal tumors

David I. Chu, Jessica C. Lloyd, Zarine R. Balsara, John S. Wiener, Sherry S. Ross, Jonathan C. Routh*

Division of Urologic Surgery, Duke University Medical Center, Durham, NC 27710, USA

Received 29 July 2013; accepted 23 December 2013
Available online 22 January 2014

KEYWORDS
Pediatrics;
Kidney neoplasms;
Nephrectomy;
Practice pattern variations

Abstract *Objective:* Given the negative long-term effects of renal insufficiency, nephron-sparing surgery (NSS) is increasingly discussed for the treatment of pediatric renal tumors. We sought to examine variation in practice patterns of NSS among children with renal tumors.
Materials and methods: We performed a retrospective cohort analysis of claims data for pediatric inpatient admissions captured by the Kids Inpatient Database (1997—2009). We identified children with renal tumors who underwent surgery, including radical nephrectomy (RN) and NSS. We used multivariable logistic regression to assess the relationship between use of NSS and various clinical, demographic, and geographic predictors of interest.
Results: We identified 10,108 pediatric inpatient admissions for renal tumors. Of these, 1657 were surgical admissions, with 1501 patients (90.5%) undergoing RN and 156 (9.5%) undergoing NSS. On multivariable analysis, NSS was associated only with a concomitant diagnosis of renal insufficiency (relative ratio [RR] 3.37, $p = 0.01$) and surgery in the Northeastern USA (RR 3.07, $p = 0.03$). Race/ethnicity, age, payer type, procedure year, and other non-clinical factors were not significantly associated with NSS.
Conclusion: In a large, nationwide pediatric cohort, RN remains the most common surgical intervention for renal tumors. NSS is significantly associated with a diagnosis of renal insufficiency, but not non-clinical factors such as patient gender or race. © 2014 Published by Elsevier Ltd on behalf of Journal of Pediatric Urology Company.
© 2014 Journal of Pediatric Urology Company. Published by Elsevier Ltd. All rights reserved.

Introduction

In adults, controversy remains regarding whether nephron-sparing surgery (NSS) is the optimal management strategy for renal tumors [1,2], even as some note a recent rise in utilization of NSS [3]. What is not as controversial, however, are the negative effects of chronic kidney disease (CKD),

* Corresponding author. Tel.: +1 919 684 6994; fax: +1 919 681 5507.
E-mail addresses: jonathan.routh@duke.edu, jon.routh@duke.edu (J.C. Routh).

1477-5131/$36 © 2014 Journal of Pediatric Urology Company. Published by Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.jpurol.2013.12.019

including increased risk for future cardiovascular events and death [4].

Preserving kidney function is potentially even more significant in children, whose longer life expectancy leads to more years at risk of CKD [5]. Current recommendations from the Children's Oncology Group (COG) support the use of radical nephrectomy (RN) in a non-syndromic child with a normal contralateral kidney. However, recent reports suggest that NSS can be safely applied to carefully selected children with comparable survival outcomes as RN [6—16]. Additionally, renal function in children undergoing NSS appear to be better preserved compared with those undergoing RN [17—19]. Hence, it is unclear whether and to what extent these conflicting signals have affected the utilization of NSS across time and geographic regions.

The objective of this study was to analyze variation in surgical practice patterns among children with renal tumors; we hypothesized that patients with predisposing clinical features (such as bilaterality or some degree of renal insufficiency) would be more likely to undergo NSS than RN, and that other non-clinical factors (such as patient race or gender) would be unlikely to impact on rates of RN vs. NSS. We used a national database of inpatient pediatric admissions to assess temporal trends and compare geographic, demographic, and clinical predictors of NSS compared with RN utilization.

Methods

Data source

The Kids' Inpatient Database (KID) is a product of the Healthcare Cost and Utilization Project, sponsored by the Agency for Healthcare Research and Quality (Rockville, MD, USA). The KID is a triennial, stratified sample of pediatric discharges from all community, non-rehabilitation hospitals in participating states (from 2521 hospitals in 22 states in 1997 to 4121 hospitals from 44 states in 2009) [20]. The sampling design includes 10% of uncomplicated births and 80% of all other pediatric discharges annually, generating excellent power for the detection and characterization of rare conditions. In 1997, pediatric discharges were defined as those involving patients aged 18 years or younger at their admission date. Subsequently, pediatric discharge criteria were expanded to include patients aged 20 years or younger at admission.

We combined the latest four editions of the KID (2000—09), which contained 2.5, 2.9, 3.1, and 3.4 million pediatric discharges, respectively. This study was defined as exempt by our institutional review board.

Patient and predictor selection

International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) diagnostic codes were used to identify patients with a diagnosis of a renal mass (ICD-9-CM 189.0). Patient-level demographics captured in our model included age (grouped using standard American Academy of Pediatrics age categories), race/ethnicity (white, black, Hispanic, Asian/Pacific Islander, or other), ZIP code median income by quartile, and primary insurance payer (public or private). Hospital-level factors included size (number of beds), teaching/children's hospital designation, and hospital ownership (government, private nonprofit, or private for-profit), as well as geographic location and population setting. Children's hospital designation was defined by the National Association of Children's Hospitals and Related Institutions. Teaching hospital designation was defined by the American Hospital Association Annual Survey of Hospitals. Geography was defined as US census bureau region (Northeast, South, Midwest, and West) and population setting was designated as urban or rural, also based on US census definitions.

Outcome selection

We broadly defined both diagnoses and surgical interventions based on ICD-9-CM procedure codes. We defined RN to include nephroureterectomy (55.51) or nephrectomy of a solitary kidney (55.52); transplant nephrectomy (55.53) patients were excluded. We defined NSS to include partial nephrectomy (55.4) and percutaneous ablation (55.32). In an effort to reduce double-counting of patients, we excluded those children who underwent only an open renal biopsy (55.24) or needle biopsy (55.23).

Renal insufficiency was defined based on ICD-9-CM or Clinical Classification Software diagnostic/procedure codes for acute renal failure, chronic renal failure, dialysis, or renal transplant. We attempted to identify bilateral tumors based on codes for bilateral nephrectomy (55.54); dual codes for partial nephrectomy; or codes for both RN and NSS. Unfortunately, coding for bilateral tumors lacked adequate granularity to be included in the multivariable analysis.

Statistical analysis

Initial bivariate tests of association were performed using Fisher's exact, chi-square, Cochran-Armitage trend, or Wilcoxon rank-sum tests based on data characteristics. We then constructed our multivariable logistic regression model; covariates were a priori selected based on biological plausibility and/or a p-value ≤ 0.2 in bivariate analysis. Patient-level covariates considered for our model included patient age, gender, race/ethnicity, insurance payer, median income of the patient's home ZIP code, year of admission, and diagnosis of renal insufficiency. Hospital-level covariates included admitting hospital, geographic region, and teaching/children's hospital designations. Ultimately, the final model included patient age, race, insurance payer, children's hospital designation, hospital region, and renal insufficiency diagnosis. Model diagnostics revealed no significant violations of regression assumptions. We corrected for hospital-level clustering using generalized estimating equations with hospital as a random effect.

All analyses were performed using SAS version 9.3 (SAS Institute, Cary, NC, USA). All tests were two-sided and p-values of ≤ 0.05 were considered to be significant.

Download English Version:

https://daneshyari.com/en/article/4162624

Download Persian Version:

https://daneshyari.com/article/4162624

Daneshyari.com