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Renal function in pediatric urologic surgical patients: Insight from the National Surgical Quality Improvement Program—Pediatric cohort

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Abstract

Background: Renal protection is a frequent indication for urological surgery in pediatric patients; however, preoperative assessment is not routinely performed. We assessed the rates of preoperative renal function testing and stratified outcomes after major pediatric urological surgery. Pediatric urology patients, specifically high-risk patients undergoing genitourinary surgeries, are likely to have an underdiagnosis of renal dysfunction after surgery.

Materials and methods: Cases were identified from the 2012 to 2019 National Surgical Quality Improvement Program—Pediatric database. Patients who underwent major urological surgery on an inpatient basis were included in this study. Abnormal renal function was defined as a creatinine (Cr) level of ≥0.5 mg/dL (younger than 2 years) and a glomerular filtration rate of <90 mL/min (2 years or older). Glomerular filtration rate was calculated using the bedside Schwartz equation (2 years or older): estimated glomerular filtration rate = 0.413 × (height/Cr).

Results: A total of 17,315 patients were included, of whom 3792 (21.9%) had documented Cr values. Based on the defined criteria, abnormal renal function was found in 7.3% of infants (younger than 2 years), 6.3% of children (2–9 years), and 15.0% of adolescents (10–18 years). Patients with abnormal preoperative renal function values were significantly ($p < 0.001$) more likely to experience readmission (10.2% vs. 5.8%), reoperation (3.7% vs. 1.6%), surgical organ/space infection (0.9% vs. 0.4%), transfusion (1.5% vs. 0.6%), renal insufficiency (1.6% vs. 0.4%), or urinary tract infection (5.1% vs. 3.6%).

Conclusions: In this pediatric population, 21.9% of the patients had documented preoperative Cr values before major urological surgery. Patients with documented abnormal preoperative renal function tests experienced higher complication rates. These patients have higher rates of progressive renal insufficiency and acute renal failure than those with normal renal function. The introduction of a standardized and unbiased risk assessment tool has the potential to offer patients benefits by pinpointing individuals with a heightened risk of complications. Further investigation is necessary to enhance the precise categorization of at-risk patients.

Keywords: Glomerular filtration rate; Preoperative care; Congenital abnormalities; Urological surgical procedures; Outcomes

1. Introduction

Congenital anomalies of the kidney and urinary tract (CAKUTs) represent a broad spectrum of renal malformations, with an incidence of approximately 4.2 per 10,000 births.[1] Congenital anomalies of the kidney and urinary tract are a major cause of chronic kidney disease (CKD) in children, representing 40% of the cases in the North American Pediatric Renal Transplant Cooperative Study registry.[2] Children with CAKUTs have an elevated risk of developing end-stage renal disease later in life.[3] Although most patients with CAKUTs are medically managed, surgery is necessary to prevent renal damage or correct recurrent urinary tract infections (UTIs).[4] The diagnosis, treatment, and management of children with CAKUTs are important for renal preservation.

According to the National Kidney Foundation Kidney Disease Outcomes Quality Initiative clinical practice guidelines, children with kidney disease should have routine laboratory measurements performed.[5] Although there is no clear consensus on how to best measure renal function in children, the bedside Schwartz formula, which was developed in 2009 using serum creatinine (Cr), is considered by the National Kidney Foundation to be the best measure to estimated glomerular filtration rates (GFRs) in children, although cystatin-C is seen as a quality measure in older children.[6] The Chronic Kidney Disease in Children study, which included 586 pediatric patients with CKD across the United States and Canada, further supports the use of the bedside Schwartz equation.[7] Because an estimated 18.5 to 58.3 million children globally have CKD, adverse outcomes can be delayed by angiotensin-converting enzyme inhibitors and angiotensin II receptor blockers for intensive blood pressure control.[8–11] Using the National Surgical Quality Improvement Program—Pediatric (NSQIP-P) data, the rate of preoperative renal function testing was determined, and complication rates were explored for major pediatric urological surgeries.

The hypothesis of this study is that pediatric urology patients, specifically higher-risk patients undergoing urological surgery, are likely to be underdiagnosed with renal dysfunction.

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2. Materials and methods

2.1. Data acquisition

After obtaining institutional review board exemption, data from the 2012–2019 American College of Surgeons (ACS) National Surgical Quality Improvement Program—Pediatric (ACS-NSQIP-P) Participant User File was obtained. The ACS-NSQIP-P is a national surgical database that records numerous variables, including patient demographics and perioperative details. Data were collected from 148 hospitals and validated for short-term outcomes. The data were collected and verified by a surgical clinical reviewer over an 8-day cycle. The NSQIP-P is an attractive model for studying renal function because of the large number of cases across the United States. Because the NSQIP-P contains deidentified information, the ACS-NSQIP-P Participant User File is compliant with the Health Insurance Portability and Accountability Act.

2.2. Inclusion and exclusion criteria

The NSQIP-P database was searched for children (younger than 18 years) from 2012 to 2019. Current procedural terminology codes for patients who had undergone surgical management for inpatient genitourinary modifying surgeries were as follows: ureteroneocystostomy (50780, 50782), nephrectomy (50220, 50230, 50544, 50546), pyeloplasty (50405), vesicostomy (51980), cutaneous appendicovesicostomy (50845), ureteroureterostomy (50760), and bladder exstrophy closure (51940). Patients with missing values for height, weight, operation time, total length of hospital stay, or the American Society of Anesthesiologists (ASA) classification were excluded. Patients were also excluded if their surgery was urgent or an emergency. Patients with an unknown or current cancer diagnosis were excluded. Patients were dichotomized based on the presence or absence of serum Cr levels 90 days before surgery. This study adhered to the Strengthening the Reporting of Observational Studies in Epidemiology checklist.

2.3. Variables

Patient and intraoperative characteristics included age (in months), sex, race, ethnicity, ASA status, history of asthma, history of structural central nervous system (CNS) abnormalities (such as spina bifida), nutritional support at the time of surgery, and operative time.

2.4. Endpoints

The patients were grouped according to age into infants (younger than 2 years), children (2–9 years), and adolescents (10–18 years). For patients 2 years or older with Cr laboratory values documented, GFR was calculated using the bedside Schwartz equation: estimated GFR = 0.413 × (height/Cr). Glomerular filtration rate <90 mL/min was defined as abnormal in this group of patients. A serum Cr level at or higher than 0.5 mg/dL was defined as abnormal in patients younger than 2 years. The composite endpoints of the 30-day complication rates after genitourinary surgery were defined as readmission, reoperation, renal insufficiency, systemic sepsis, and UTI. Blood transfusions at the time of surgery are included in the complication table to ensure completeness. However, blood transfusions were not considered a NSQIP complication, as they were not considered adverse events in hospital reports. Based on the NSQIP-P definition, progressive renal insufficiency was defined as a rise in Cr level of >1 mg/dL postoperatively, whereas acute renal failure was defined as requiring dialysis. Urinary tract infection was defined as a positive urine culture (>10^5 CFU/mL) with 2 or fewer microbial species and at least 1 urinary symptom in the absence of another cause.

2.5. Statistical analyses

Differences in patient demographics between the 2 groups were assessed using the Wilcoxon signed rank test for categorical variables and the Mann-Whitney *U* test for continuous variables to account for nonparametric data. Continuous variables were recorded as median and interquartile range, whereas categorical variables were recorded as frequencies and percentages. The analysis was conducted using the Statistical Package for the Social Sciences version 28.0 (IBM Corp., Armonk, New York) and R version 4.1.0. with the RCommander package (GNU General Public License, Boston, MA) and EZR PlugIn.[12] Significance was defined based on a 2-tailed p value of <0.05.

3. Results

A total of 17,315 patients met the inclusion criteria: 13,523 patients (78.1%) had no Cr laboratory values, and 3792 patients (21.9%) had Cr laboratory values. Among the entire cohort, the patients were mostly White (76.8%), with a slight female predominance (55.2%). The patients were most often categorized as children (51.4%), followed by infants (33.4%). Moreover, 2885 patients (16.7%) had an ASA score greater than 2, 537 (3.1%) had asthma as a comorbidity, 1318 (7.6%) had a general CNS structural abnormality, and 510 (2.9%) received nutritional support at the time of surgery.

A summary of the patient demographics is shown in Table 1. The patients were dichotomized according to their preoperative renal functions. Patients with preoperative Cr levels had higher rates of ASA scores greater than 2 (35.2% vs. 11.5%), asthma (3.9% vs. 2.9%), presence of CNS structural abnormalities (13.6% vs. 5.9%), and nutritional support (7.7% vs. 1.6%), with significant differences overall (p < 0.001, except for asthma, p = 0.003). Trends in missing Cr laboratory values drawn between 2012 and 2019 before genitourinary surgery remained stable (Table 1). The Cochran-Armitage test for trends was not significant (p = 0.171).

A summary of the preoperative renal function test results in those who were available is shown in Table 2. Abnormal renal function was demonstrated in 7.3% of infants, 6.3% of children, and 15.0% of adolescents based on previously defined criteria. The preoperative renal function test rates based on surgery are described in Table 3. The rates of preoperative renal testing were the lowest in ureteroneocystostomy, nephrectomy, complicated pyeloplasty, ureteroureterostomy, and ureterostomy, with greater than 60% of cases having absent Cr laboratory values 90 days before surgery.

A basic summary of the complications affecting preoperative renal function is shown in Table 4.

Statistical analysis demonstrated that patients with preoperative Cr laboratory evaluation were significantly (p < 0.001) more likely to experience readmission (10.2% vs. 5.8%), reoperation (3.7% vs. 1.6%), organ/space surgical site infection (0.9% vs. 0.4%), transfusion (0.6% vs. 0%), progressive renal insufficiency (1.6% vs. 0.4%), systemic sepsis (1.5% vs. 0.6%), and UTI (5.1% vs. 3.6%). The bedside Schwartz equation further refined the GFR into either normal (>90 mL/min) or abnormal (<90 mL/min) rates for adolescents and pediatric patients undergoing Cr evaluation. Infants were separately described as having an abnormal renal function based on a Cr level at or higher than 0.5 mg/dL. Patients with abnormal renal function after evaluation were significantly more likely (p < 0.001) to progress to acute renal failure (3.1% vs. 0.2%), defined as requiring dialysis within 30 days after surgery. Moreover, patients with abnormal renal function were significantly (p < 0.001) more likely to experience progressive renal

Table 1

Demographics of patients by Cr values before renal surgery.

Characteristics	Absent Cr	Present Cr	Total	p
	n = 13,523	n = 3792	n = 17,315	
Age, median [IQR], mo	50 [17–89]	53 [14–109]	48 [17–93]	**0.042**
Age group, n (%)				
Infants (<2 yr)	4463 (33.0)	1321 (34.8)	5784 (33.4)	**<0.001**
Children (2–9 yr)	7228 (53.4)	1675 (44.2)	8903 (51.4)	
Adolescent (10–18 yr)	1832 (13.5)	796 (21.0)	2628 (15.2)	
Female, n (%)	7711 (57.0)	1850 (48.8)	9561 (55.2)	**<0.001**
Race, n (%)				
White	10,514 (77.7)	2779 (73.3)	13,293 (76.8)	**<0.001**
African American	849 (6.3)	411 (10.8)	1260 (7.3)	
Asian	358 (2.6)	146 (3.9)	504 (2.9)	
Unreported	1802 (13.3)	456 (12.0)	2111 (12.2)	
Hispanic ethnicity, n (%)	1864 (13.8)	512 (13.5)	2376 (13.7)	0.669
ASA >2, n (%)	1551 (11.5)	1334 (35.2)	2885 (16.7)	**<0.001**
Cardiac risk	699 (5.2)	499 (13.2)	1198 (6.9)	**<0.001**
Asthma, n (%)	391 (2.9)	146 (3.9)	537 (3.1)	
CNS abnormality, n (%)	802 (5.9)	516 (13.6)	1318 (7.6)	**<0.001**
Nutritional support, n (%)	219 (1.6)	291 (7.7)	510 (2.9)	**<0.001**
Year, n (%)				
2012	1178 (76.8)	355 (23.2)	1533 (8.9)	**<0.001**
2013	1132 (74.3)	390 (25.7)	1522 (8.8)	
2014	1245 (76.4)	385 (23.6)	1630 (9.4)	
2015	1540 (76.4)	429 (23.3)	1969 (11.4)	
2016	1766 (78.0)	497 (22.0)	2263 (13.1)	
2017	1904 (79.3)	498 (20.7)	2402 (13.9)	
2018	2272 (80.4)	555 (19.6)	2827 (16.3)	
2019	2486 (78.5)	683 (21.5)	3169 (18.3)	

ASA = American Society of Anesthesiologists; CNS = central nervous system; Cr = creatinine; IQR = interquartile range.
Bold represents p values <0.05.

insufficiency (0.8% vs 0.1%), defined as a rise in Cr level of >1 mg/dL within 30 days after surgery. Rates of readmission (12.5% vs. 9.1%, $p = 0.002$) and reoperation (4.9% vs. 3.2%, $p = 0.014$) were significantly higher in patients with abnormal renal function.

4. Discussion

The data demonstrated that 21.9% of patients had their renal function assessed within 90 days before surgery, with a serum Cr level. These data will miss patients with Cr assessed before 90 days and some who will have GFR measured by nuclear scans; therefore, this number is likely to be somewhat higher in clinical practice. Patients with a preoperative workup tended to have higher complication rates. These patients had at least 2 times higher rates of many of the complications assessed, including readmission, reoperation, organ/space surgical site infection, progressive renal insufficiency, and systemic sepsis. These patients have higher rates of progressive renal insufficiency and acute renal failure. Although one may argue that medical teams are proficient in selecting high-risk patients, the data suggest that patients are also being missed. Patients without renal assessment had NSQIP complication rates >5% across each of the major surgeries included. Overall, this population of patients may benefit from a more objective way to identify at-risk patients as part of the standard of care, namely, to determine who may benefit from medical optimization before surgery.

Pediatric patients with abnormal renal function are at high risk of progression to end-stage renal disease and therefore should be screened more often. In a trial of 4166 pediatric patients with CKD stages II to IV from the North American Pediatric Renal Collaborative Studies, patients showed a progression rate to end-stage renal disease of 17% at 1 year and 39% at 3 years.[6] Patients with kidney injury are at a higher risk of worsening disease severity. In a population of 147 patients with the majority having CAKUTs, patients with acute kidney injury were found to have higher rates of CKD progression.[13] Although the measurement of GFR by serum Cr in children is the best predictor of renal function, the fact that predicting kidney function is challenging to accurately assess in clinical practice means that many pediatric urologists likely forego measurement in this population.[14] Because patients with undiagnosed CKD are at a high risk of complications, it is imperative that surgeons working with this at-risk population be aware of these risks, as in many cases, they are the frontline treating physicians for these issues.

Current pathways for the management of CKD involve annual monitoring of renal function and proteinuria annually.[15] Monitoring is necessary in CKD patients because renal function deteriorates progressively, as described previously. Early medical intervention in patients with CKD has been shown to delay renal failure progression.[16] In clinical practice, kidney function is assessed only based on evidence of kidney injury, such as physical examination findings (eg, hypertension or edema) or proteinuria.[17] A major challenge for this population is that patients are often asymptomatic.[18] As suggested by our results and supported by data from Katsoufis et al.,[19] patients with an abnormal renal function test are more likely to experience a complication; therefore, assessing GFR before surgery is crucial to better counsel patients, coordinate medical management, and preserve kidney function in the long term.

Although there are care pathways for managing acute kidney injury and CKD in children, there is a need for better risk stratification based on renal function in pediatric patients before urological surgery. One of the major challenges is determining when to intervene

Table 2

Preoperative renal function testing in patients undergoing a major renal modifying surgery.

	Patients	Cr Evaluated	Cr Missing	GFR Median [IQR]	Cr ≥0.5 n	Abnormal renal (with Cr available)
Infant (<2 yr)	5784	1321 (22.8%)	4463 (77.2%)	88.8	278	278 (7.3%)
Children (2–9 yr)	8903	1675 (18.8%)	7228 (81.2%)	102.7 [79.5–125.9]	NA	565 (6.3%)
Adolescents (10–18 yr)	2628	796 (30.3%)	1832 (69.7%)	90.5 [66.6–114.4]	NA	393 (15.0%)
All patients	17,315	3792 (21.9%)	13,523 (78.1%)	NA	NA	1236 (32.6%)

Cr = creatinine; GFR = glomerular filtration rate; IQR = interquartile range.
Bedside Schwartz equation: estimated GFR = 0.413 × (height in cm/Cr).
Abnormal renal function: Cr level of ≥0.5 mg/dL for patients 2 years or younger or GFR of <90 mL/min for patients older than 2 years.

Table 3

Rates of preoperative renal function parameters for each surgery.

n = 17,315	Surgery	Absent Cr, n (%)	Present Cr, n (%)		Total
			Normal renal function	Abnormal renal function*	
Infants (0–2 yr)	Uteroneocystostomy	1791 (84.4)†	278 (13.1)	52 (2.5)	2121
n = 5784	Nephrectomy	768 (74.6)	218 (21.2)	43 (4.2)	1029
	Complicated pyeloplasty	1221 (78.8)	276 (18.0)	34 (2.2)	1531
	Cutaneous appendico-vesicostomy	8 (47.1)	4 (23.5)	5 (29.4)	17
	Cutaneous vesicostomy	136 (39.2)	104 (30.0)	107 (30.8)	347
	Ureteroureterostomy	313 (83.7)	53 (14.2)	8 (2.1)	374
	Ureterostomy	167 (77.0)	46 (21.2)	4 (1.8)	217
	Bladder closure	59 (39.9)	64 (43.2)	25 (16.9)	148
Children (2–9 yr)	Uteroneocystostomy	4738 (87.1)	80 (8.8)	225 (4.1)	5443
n = 8903	Nephrectomy	1303 (75.6)	278 (16.1)	143 (8.3)	1724
	Complicated pyeloplasty	426 (82.6)	56 (10.8)	34 (6.6)	516
	Cutaneous appendico-vesicostomy	320 (53.1)	198 (32.9)	84 (14.0)	602
	Cutaneous vesicostomy	198 (65.6)	45 (14.9)	59 (19.5)	302
	Ureteroureterostomy	167 (86.5)	16 (8.3)	10 (5.2)	193
	Ureterostomy	69 (68.3)	26 (25.7)	6 (6.0)	101
	Bladder closure	7 (31.8)	11 (50.0)	4 (18.2)	22
Adolescent (10–18 yr)	Uteroneocystostomy	496 (79.2)	57 (9.1)	73 (11.7)	626
n = 2502	Nephrectomy	841 (71.5)	142 (12.1)	193 (16.4)	1176
	Complicated pyeloplasty	117 (77.0)	18 (11.8)	17 (11.2)	152
	Cutaneous appendico-vesicostomy	274 (54.7)	149 (29.7)	78 (15.6)	501
	Cutaneous vesicostomy	39 (48.8)	17 (21.2)	24 (30.0)	80
	Ureteroureterostomy	37 (82.2)	4 (8.9)	4 (8.9)	45
	Ureterostomy	25 (56.8)	15 (34.1)	4 (9.1)	44
	Bladder closure	3 (75.0)	1 (25.0)	0 (0)	4

Cr = creatinine; GFR = glomerular filtration rate.
*Abnormal was defined as GFR of <90 mL/min for patients older than 2 years or with a serum Cr level of ≥0.5 mg/dL for patients 2 years or younger before surgery.
†Total percentage in each row adds up to 100%.

in patients with abnormal renal values. The clarity is noticeably absent in the practice guidelines. Future multidisciplinary studies are needed to better understand the best time to intervene in children with kidney disease and how to best manage these patients in general. Pediatric urology, as a subspecialty, should lead this effort, and improvements should start by understanding deficiencies. Raising awareness about the importance of preoperative renal function testing and stratification, as well as the rates of complications in higher-risk patients, should be the focus of further study by our specialty.

Our study has several limitations, as missing data could introduce bias. However, the Schwartz equation has inherent flaws. Moreover, there are numerous measures and methodologies to evaluate the GFR in the pediatric population, particularly in infants. Almost every infant with a Cr level at or higher than 0.5 mg/dL has some degree of renal

Table 4

Thirty-day complications based on preoperative renal function parameters for the entire cohort.

Complications	Cr missing, n (%)	Cr evaluated, n (%)	*p*	Renal function, n (%)		*p*
				Normal	Abnormal*	
n = 17,315	n = 13,523	n = 3792		2556	1236	
NSQIP complication	1226 (9.1)	624 (16.5)	**<0.001**	380 (14.9)	244 (19.7)	**<0.001**
Readmission	789 (5.8)	386 (10.2)	**<0.001**	232 (9.1)	154 (12.5)	**0.002**
Reoperation	222 (1.6)	142 (3.7)	**<0.001**	82 (3.2)	60 (4.9)	**0.014**
Organ/space SSI	51 (0.4)	35 (0.9)	**<0.001**	25 (1.0)	10 (0.8)	0.719
Deep incisional SSI	9 (0.1)	7 (0.2)	0.061	3 (0.1)	4 (0.3)	0.225
Cardiac arrest	4 (0)	5 (0.1)	**0.029**	4 (0.2)	1 (0.1)	1
Wound dehiscence	23 (0.2)	13 (0.3)	**0.045**	9 (0.4)	4 (0.3)	1
Systemic sepsis	80 (0.6)	56 (1.5)	**<0.001**	37 (1.4)	19 (1.5)	0.886
Pneumonia	11 (0.1)	11 (0.3)	**0.003**	7 (0.3)	4 (0.3)	0.756
Unplanned intubation	12 (0.1)	15 (0.4)	**<0.001**	9 (0.4)	6 (0.5)	0.584
Progressive renal insufficiency	11 (0.4)	20 (1.6)	**<0.001**	9 (0.1)	31 (0.8)	**<0.001**
Acute renal failure	8 (0.2)	15 (1.0)	**<0.001**	2 (0.2)	13 (3.1)	**<0.001**
Transfusion	3 (0)	21 (0.6)	**<0.001**	10 (0.4)	11 (0.9)	0.062
UTI	483 (3.6)	195 (5.1)	**<0.001**	136 (5.3)	59 (4.8)	0.53

Bold represents *p* values <0.05.
*Abnormal was defined as GFR of <90 mL/min for patients older than 2 years or with a serum Cr level of ≥0.5 mg/dL for patients 2 years or younger before surgery.
Cr = creatinine; NSQIP = National Surgical Quality Improvement Program; SSI = surgical site infection; UTI = urinary tract infection.

impact; however, using this Cr cutoff will miss some patients who may have renal insufficiency.[20] Data from patients with a preoperative workup beyond 90 days prior was not collected in the NSQIP-P data set. Whereas previous studies have found that younger patients are less likely to receive a complete preoperative workup, Cr values may be missing at random.[21–23] Further studies are needed to evaluate missing Cr values in the NSQIP-P to determine whether the values are truly deficient in this population or missing at random.[24] The NSQIP-P analysis, which was based on, was initially developed for quality improvement rather than for outcome research, as it is used in our study. There is a lack of knowledge of what preexisting CAKUT conditions exist at baseline, which affect risk adjustment. Therefore, the cases therein may not be representative of the pediatric population. The patients in the NSQIP-P were sampled over an 8-day period. Selection bias may also have been introduced, as data were only collected from the 148 participating children's hospitals, and the participating hospitals may have different care pathways. Because the NSQIP-P only includes data from 30 days after the primary procedure, outcomes outside of this window are missed. The NSQIP-P does not account for any potential complications or comorbidities.

5. Conclusions

In this pediatric population, 21.9% of the patients had Cr values assessed before major urologic surgery. Patients undergoing renal function testing have higher rates of complications. Moreover, patients with abnormal renal function have higher rates of progressive renal insufficiency and acute renal failure than those with normal renal function. The pathways and guidelines for major pediatric urological cases have room for improvement. Patients are likely to benefit from a standardized and objective measure to determine who is at a high risk of complications. Further studies are needed to better stratify at-risk patients.

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None.

Statement of ethics

This study has been reviewed and granted exemption approval by the Institutional Review Board of Nemours Children's Health, and it was conducted in adherence with a Data Use Agreement from the NCDB program. No participants' consent statement was required for this study. All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

Conflict of interest statement

The ACS NSQIP and the hospitals participating in the ACS NSQIP are the source of the data used herein; they have not verified and are not responsible for the statistical validity of the data analysis or the conclusions derived by the authors.

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Author contributions

VC: Data collection, statistical analysis, and manuscript writing, revision, and approval;
CR: Data collection, statistical analysis, and manuscript writing and approval;
AAS: Concept design, data collection, statistical analysis, and manuscript writing, revision, and approval.

Data availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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