

Evaluating the distance travelled for urological pediatric appointments

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Abstract

Introduction: In Quebec, eight pediatric urologists practice in three tertiary centers covering large territories. To improve the availability of pediatric urology to distant families and to reduce the economic burden on them, we examined the charts of all patients attending the pediatric urological outpatient clinic. Our objectives were to evaluate the distance travelled by each urological pediatric outpatient and to report the most frequent urological referral complaints.

Methods: From July 2016 to June 2017, we retrospectively reviewed the charts of all the 3604 pediatric patients seen in the outpatient urological clinic of the CHU de Québec. We specifically focused on travel distance covered by families and the reason for referral.

Results: Most patients were boys (78%) and the mean age was 7.2 years. The average one-way distance travelled by each family was 69 km. The patients came more frequently from Capitale-Nationale (63.7%) and Chaudière-Appalaches (21.9%), the closest regions. The most common reasons for consultations were postoperative followups (15%), phimosis and adhesions (14%), enuresias (14%), hydronephrosis (13%), micturition disorder (11%), and cryptorchidism and retractile testicles (8%). Of all patients seen for phimosis or cryptorchidism, only 24% and 36% of them, respectively, were scheduled for surgery.

Conclusions: Phimosis, cryptorchidism, and voiding disorders are the most frequent pediatric urological reasons for consultation; primary care continuing medical education seems worthwhile. It would, perhaps, be more beneficial for all to have the pediatric urologists travelling to perform clinics and surgeries in distant regions to save more than 300 km round trip to several families.

Introduction

In the province of Quebec, pediatric urologists are distributed between three tertiary centers: McGill University, Université de Montréal, and Université Laval. In order to offer the best urological care, each center must cover a large

part of the 1667 million km² territory and several administrative regions. Unfortunately, some cities are several hundred kilometers away from the closest tertiary center. In this context, the children and their families must skip work and school to attend their urological appointment, which implies loss of income. They must plan for travel expenses, including gas, food, and lodging. It is a socio-economic problem that also concerns other specialities.

Telemedicine is emerging as a solution to overcome long distances and to decrease patient and families absenteeism.^{1,2} In October 2012, telephone consultations became a legal fee-for-services benefit by the Régie de l'Assurance Maladie du Québec (RAMQ).³ However, telemedicine is time-consuming, still not well-defined in several provinces, and presents a frontier for physical examination. In pediatric urology, the physical examination is often the centerpiece of a consultation, and for many complaints, it is integral and decisive for treatment recommendation and to establish surgical indications.

The main objective of our study was to measure the distance travelled by each pediatric patient visiting the outpatient urology clinic and, ultimately, to propose strategies to improve the situation. Our secondary endpoint was to report the most frequent urological referral complaints in order to develop better guidelines for first-line providers.

Methods

We retrospectively reviewed the charts of 3604 outpatient consultations performed by the two pediatric urologists at the CHU de Québec between July 1, 2016 and June 30, 2017. All inpatient consultations, patients for which data were missing, or patients followed beyond their 18th birthday were excluded from the study. All information was already available and accessible through the medical software used at the CHU de Québec without requiring contact with the families. For all patients, we recorded sex, age, reason for referral, patient's address (to determine their origin), one-way distance travelled by each family, and the ratio of children needing surgery for their urological condi-

tions. All data were compiled and descriptive data analyses were performed. This study is a qualitative analysis of the information collected, which did not necessitate elaborate statistical analysis. The institution and the research ethics board approved data collection as a medical quality review.

Results

A total of 3604 outpatient consultations were analyzed within a one-year period. Among all visits, 78% of patients (n=2825) were boys and 22% (n=784) were girls. The mean age at consultation was 7.2 years (standard deviation [SD] 2.3). The one-way distance travelled by families for their urological appointment was, on average, 69 km (median 21 km). It is important to note that there were six patients included who came from New Brunswick.

Using the postal code of each patient's residence, we determined the geographical origin of the patients who were referred for urological consultation in Quebec City (Fig. 1). Unsurprisingly, most of the patients lived in the two closest regions to the CHU de Québec: 63.7% in the Capitale-Nationale and 21.9% in the Chaudières-Appalaches (Fig. 2). However, Saguenay-Lac-St-Jean and Bas-St-Laurent/Gaspésie represent 3.5% and 3.7% of the referred population, respectively. For each of these regions, this represents 18.9% of our patients who travelled more than 200 km round trip for their urological appointment. One hundred and seven patients travelled more than 400 km one-way for their medical visit, which implies more than one day off work and extra lodging expenses. It is important to note that these lodging expenses can be partially reimbursed by the government upon request.

We recorded more than 60 different reasons for consultations (Table 1). The most common reason for pediatric urological visit was postoperative followup (n=529, 15%). The first reason for urological referral was phimosis (n=512,

14%), followed by nocturnal enuresis (n=501, 14%), hydro-nephrosis (n=479, 13%), micturition disorder (including incontinence, urinary retention, overactive bladder, and dysfunctional voiding) (n=384, 11%), and cryptorchidism (n=289, 8%). These six urological reasons for appointments represent 75% of all the consultations in the one-year study period.

The children were referred by their family doctor, their pediatrician, a community urologist, or a nurse practitioner for surgical issues. Phimosis and cryptorchidism were the two most common urological pathologies requiring surgery. Of the 512 consultations for phimosis, only 123 patients were ultimately scheduled for a medically indicated circumcision (24%) (Fig. 3). Others were physiological adhesions or successfully medically treated phimosis using corticosteroid cream. However, there were 289 consultations for cryptorchidism, of which 105 of them required surgical correction (36%), the remaining being retractile testis, an issue that can be difficult to evaluate using telemedicine (Fig. 4).

Discussion

To our knowledge, we are the first to report the distance travelled by families over a one-year period to attend a tertiary pediatric urological outpatient clinic. Previous Canadian reports from Shivji et al and Bator et al focused on travel expenses related to a pediatric surgical clinic and the family attitude toward telemedicine alternatives.^{1,2} Knowing that the greater the distance from home to the clinic, the greater the expenses, we aimed to characterize the pediatric population referred to a single tertiary outpatient urological clinic in Quebec.

To decrease the economic burden on patients, the RAMQ partially reimburses patients for the distance travelled if they live more than 200 km away from the hospital that can provide the appropriate care for their child.⁴ Families can also declare their travel expense in their annual income taxes. However, this leads to significant societal costs.

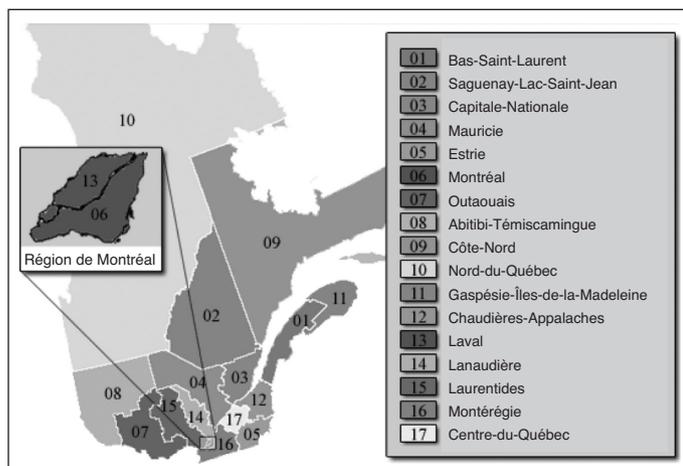


Fig. 1. Quebec's administrative regions.

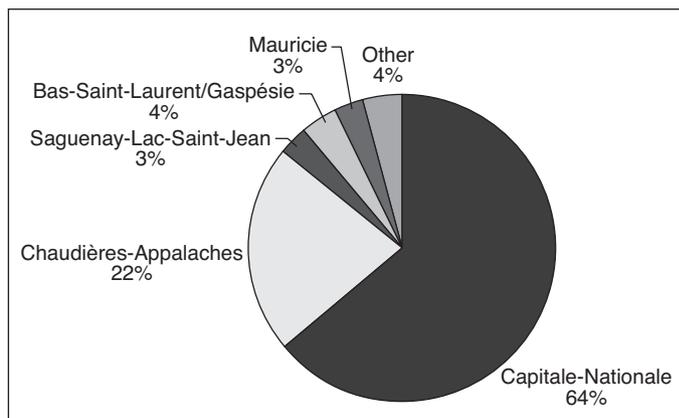


Fig. 2. Percentage of patients per region.

Table 1. Most frequent urological pediatric reason for consultation

Reason for consultation	% of all consultations
Postoperative	14.66
Phimosis	14.19
Enuresis	13.88
Hydronephrosis	13.27
Micturition disorder other than enuresis	10.64
Cryptorchidism and retractile testis	8.01
Vesicoureteral reflux	4.10
Hydrocele, varicocele, and scrotal anomalies	3.38
Others	17.87

The long distances travelled also involves significant indirect costs for the families. Out-of-pocket costs for accessing healthcare, such as parking, lodging, meals, and time away from work and school, cause significant financial burden. In their survey measuring costs for urological or general pediatric surgery consultations, Bator et al confirmed that more than 74% of parents missed at least half a day of work. Furthermore, nearly 70% perceived overall costs of a clinic visit to be medium to high.² These numbers provide an idea of the impact experienced by the families in our study. Even though only 18.5% of the patients included in Bator's assessment travelled more than 200 km round trip to attend their appointment, 33% of them spent more than \$50 CAD, not including work missed; for several families, this cost burden could substantially affect their budget. In comparison, 18.9% of our patients travelled more than 200 km round trip.

Our study demonstrates that the majority (63.7%) of the patients seen for urological pediatric consultation came from the Capitale-Nationale region, which includes Quebec City. However, the Capitale-Nationale region covers 18 640 km² and comprises cities as far as 215 km away. In fact, more than 50% of the patients from the 3604 studied travelled more than 40–50 km to attend their appointment, for an average one-way distance of 69 km (median 21 km).

The second region most frequently served by the two pediatric urologists in our study is Chaudières-Appalaches

(21.9%). Some patients from these remote communities may even have had to fly more than 1000 km to attend the clinic.

Several solutions can be introduced to overcome distance and associated fees, including telemedicine for large territories. In 2015, le Collège des médecins du Québec published guidelines for the use of telemedicine.⁵ Furthermore, in 2012, the RAMQ created a fee-of-services for telemedicine consultations.⁶ There are only few studies about telemedicine in pediatric surgery specialities.^{2,3,7} The centers in those studies had large territories to cover and they evaluated the usefulness of telemedicine and the level of family satisfaction; all reported a high satisfaction with both preoperative and postoperative evaluation from families and practitioners. Some other studies evaluated telemedicine uniquely in urology.⁸⁻¹⁰ All of them reported reduced costs and time for patients and improved patient satisfaction and access to the healthcare system. None of these studies demonstrated a reduction in mortality, morbidity, or major complications. Telemedicine in urology is particularly useful for problems like lithiasis, surveillance of renal cysts, and chronic management of micturition disorders, when imaging and initial evaluation can be provided by the referring center. Consultations or preoperative evaluations with physical evaluation are not situations in which telemedicine best serves the urologist or the patient. Nevertheless, telemedicine in pediatric urology could be worthwhile for pathologies such as incontinence, hydronephrosis, micturition disorder, and postoperative evaluation. However, this type of practice brings confidentiality, billing, and productivity adjustments, and must be avoided if physical examination is necessary, as with phimosis and cryptorchidism (representing 14% and 8% of our referrals, respectively).¹¹

Another possible solution to the travel and cost issue could be for the pediatric urologist to visit specific community centers once or twice a year, as the CHU de Québec's adult urologists are already doing. Looking at our numbers, providing pediatric urological consultation in Saguenay-Lac-St-Jean (3.5%) and Bas-St-Laurent/Gaspésie (3.7%) would help a great number of patients and considerably reduce their travel distance. However, installations must be

appropriate for consultation and imaging facilities must be easily accessible. Further, in a small team of two pediatric urologists, the absence of one individual puts a significant workload on the one covering the tertiary center. Providing support to the community-based urologists overloaded by adult cancer may help them provide care for the children in their own region.

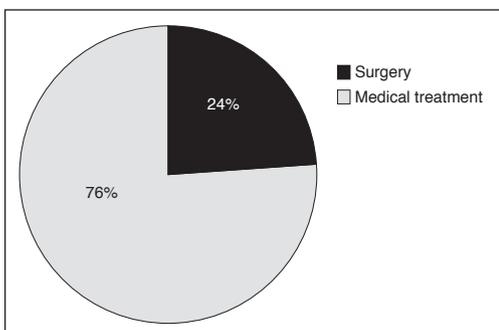


Fig. 3. Percentage of phimosis consultations requiring surgery.

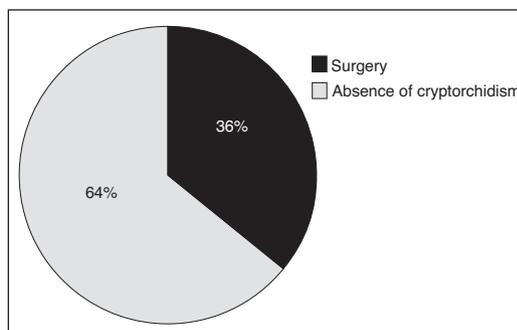


Fig. 4. Percentage of cryptorchidism consultations requiring surgery.

In the present study, only 24% of children referred for phimosis and 36% for cryptorchidism were ultimately scheduled for surgical intervention. Several had a diagnosis of physiological adherent prepuce or retractile testis followed by conservative management. Those numbers correspond to the Canadian conclusions of McGregor and Metcalfe, showing that the vast majority of phimosis references by primary care providers are not treated or are followed conservatively with first-line treatments.^{12,13} The same conclusions were made for cryptorchidism consultations in Canada.^{14,15} These statistics should make us question the medical training of our residents and the continuous medical education provided to primary care providers, including nurse practitioners, as urology rotation is optional in Quebec. Several educational initiatives on preputial and testicular pathophysiology may be worthwhile. Urological rotations, conferences, videos, and brochures are useful ways to strengthen the urological knowledge of primary care physicians.

The results of our study should be interpreted in the light of some limitations. First, the retrospective nature of this study introduces selection and information bias. Some patients were referred for more than a single urological problem but only the main problem was accounted for. Other patients visited more than once in this one-year study for the same medical problem. These biases may have increased the percentages of certain pathologies needing a closer followup. We also naturally tend to postpone appointments after the winter season for distant families. Several patients with urological issues were also concomitantly seen by different services, such as pediatric general surgery and nephrology but those numbers were not captured. In our center, we also try to coordinate several same-day speciality appointments and same-day family appointments. This may mean, for example, that we have seen a patient with simple phimosis that could have been easily taken care of by the community-based urologist, but he had a scheduled appointment with the pediatric neurosurgeon in Quebec on that day and was, therefore, offered an appointment with the pediatric urologist as well.

Conclusions

In terms of land area, Quebec is the largest province in Canada and its tertiary medical centers must cover very large territories. Travelling from remote areas to meet the pediatric urologist brings major organizational and societal costs. The average pediatric patient travels 140 km round trip to see the urologist. There are many possible improve-

ments to facilitate access to a pediatric urologist. The use of telemedicine can be introduced for specific situations for which a physical examination is not the most important part of the assessment. Community-based consultations should be promoted and on-site consultation by the pediatric urologist should be assessed. Furthermore, improving urological education to primary care providers could help achieve more effective coverage. This reality is applicable to other Canadian provinces and these solutions could be useful for other tertiary centers and specialties.

Competing interests: Dr. Bolduc has been a principle investigator in clinical trials supported by Astellas and Pfizer. Dr. Moore has been an advisory board member for Pfizer; has received speaker honoraria from Duchesnay and Hollister, and has participated in clinical trials supported by Astellas and Pfizer. The remaining authors report no competing personal or financial interests related to this work.

This paper has been peer-reviewed.

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