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Initiation of a medical toxicology consult service at a tertiary care children's hospital

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Abstract

Currently, only 10% of board-certified medical toxicologists are pediatricians. Yet over half of poison center calls involve children < 6 years, poisoning continues to be a common pediatric diagnosis and bedside toxicology consultation is not common at children's hospitals. In collaboration with executive staff from Department of Pediatrics and Emergency Medicine, regional poison center, and our toxicology fellowship, we established a toxicology consulting service at our tertiary-care children's hospital. There were 139 consultations, and the service generated 13 consultations in the first month; median of 11 consultations per month thereafter (range 8–16). The service increased pediatric cases seen by the fellowship program from 30 to 94. The transition to a consult service required a culture change. Historically, call center advice was the mainstay of consulting practice and the medical staff was not accustomed to the availability of bedside medical toxicology consultations. However, after promotion of the service and full attending and fellowship coverage, consultations increased. In collaboration with toxicologists from different departments, a consultation service can be rapidly established. The service filled a clinical need that was disproportionately utilized for high acuity patients, immediately utilized by the medical staff and provided a robust pediatric population for the toxicology fellowship.

Keywords

Pediatrics; Consult service; Poison center

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Declaration of interest

The authors report no declarations of interest. The authors alone are responsible for the content and writing of the paper.

Introduction

Pediatricians were integral in the development of the discipline of medical toxicology in the 1950s and 1960s primarily by providing telephone advice about unintentional pediatric household exposures and advocating for preventative measures such as child-resistant packaging. Over time, however, emergency physicians have predominated in medical toxicology fellowships and careers. Currently, only 42 (10%) of board-certified medical toxicologists are pediatricians.¹⁻³ While the proportion of medical toxicologists trained in pediatrics has decreased, over half of poison center calls still involve children < 6 years and death rates from poisoning in children less than 19 years has increased by 80% over the last decade, primarily in the adolescent population.^{4,5} However, bedside toxicology consultation services at children's hospitals are not common. Prior to our service, 16 American College of Medical Toxicology Toxicology Investigators Consortium (ToxIC) sites were children's hospitals, and 6 of these listed in the top 10 of the 183 Pediatric Centers listed in the US News World Report ranking of children's hospitals.^{6,7}

Our children's hospital is a high volume regional tertiary care hospital providing multiple subspecialty services to a large catchment area, including three surrounding states. It has 440 hospital beds, over 14,000 admissions, and over 96,000 emergency room visits annually.⁸ Prior to our service, bedside medical toxicology consultations were not regularly available. Consultations were performed only by phone by our regional poison center (RPC). Our aim is to describe the establishment and experiences of a pediatric medical toxicology consultation service at our pediatric hospital with focus on the critical steps in service development. We also describe the impact of the service on our medical toxicology fellowship program and our RPC.

Administrative support

In collaboration with the Department of Pediatrics, Sections of Pediatric Emergency Medicine and Department of Emergency Medicine, our RPC and medical toxicology fellowship, we established a consulting service. Approval of the service came from the Chair of Pediatrics, the Section Head of Pediatric Emergency Medicine and General Emergency Medicine at the children's hospital, and associated adult university hospital. Revenue generated from consultations was compiled in a new section fund to be shared for academic endeavors under the section of Emergency Medicine.

Service staffing

Our primary faculty team consisted of six board-certified medical toxicologists: one with primary Pediatric board certification and five were primary Emergency Medicine board certification, with medical staff appointments at six hospitals. The faculty are all associated with the RPC and our medical toxicology fellowship program. All faculty obtained consulting privileges at the children's hospital under the section of Pediatric Emergency Medicine. Medical toxicology fellows are employed by the RPC and its affiliated hospital, with trainee privileges at the children's hospital.

Critically ill patients were evaluated immediately by medical toxicology fellows. There was no call schedule available to the hospital staff. Instead, we collaborated with the RPC, which served as the primary contact for consultation requests 24 h a day, 7 days a week. The RPC remained the primary contact for several reasons: assurance of continued collaboration between the service and the poison center, including full data collection and poison center participation in patient care; to streamline the process in how a medical toxicologist would be contacted; and to help facilitate the use of the service. Specialists in Poison Information offered a medical toxicology consultation with every phone call and on-call faculty and fellows were notified of consult requests immediately. Faculty and fellows were also notified of calls from the hospital that did not request a consultation.

Service visibility

Promotion of the new consulting service was made via email communications to chief residents, pediatric inpatient, critical care, emergency department (ED) medical directors and their fellowship program directors. Faculty maintained high visibility at teaching opportunities such as resident morning reports and noon conferences to further promote the service. We instructed services to call the poison center as they previously did with exposures, but request specifically for a bedside consultation if needed.

Clinical volume

There were 139 consultations in the first year of service: age range was 1 month to 18 years in a bimodal distribution typical of toxicology patients (2- and 16 years), 67% were female. There were 52 calls to the RPC from the inpatient and critical care units where consults were either unavailable or not requested. The patient acuity was high. There were 14 (10%) ED consultations, 62 (45%) inpatient, and 63 (45%) critical care consultations. The most common exposures and reasons for consultations were: 24 polypharmacy, 22 analgesics, 15 antidepressant/antipsychotics, 12 altered mental status, 9 antimuscarinic toxicities, 7 envenomations, and 1 case of botulism. There were two deaths: a late presenting methanol ingestion and a polypharmacy overdose who was unable to transition to extracorporeal membrane oxygenation. The service generated 13 consultations in the first month, with a median of 11 consultations per month thereafter (range 8–16). The service increased pediatric cases seen by the fellowship program from 30 in the preceding 12 months to 94. With full faculty and medical toxicology fellowship participation, the service was regularly utilized by the medical staff which has continued into our second year. In the second year of the service we have had 57 consultations in the first 4 months. In 2012, there were 417 calls from the children's hospital to our RPC (total state healthcare call volume: 5684). During our initial consultation year, calls increased to 485 (total state healthcare call volume: 6153), 29% requested a bedside consultation. The children's hospital now has the second highest call volume of any hospital to our RPC in the state.

Benefits

Bedside medical toxicology consultation has many benefits in patient care. First, for the medical toxicologist, being at bedside provides an opportunity to obtain a more accurate history and detailed physical examination, clinical trends, along with complete availability

of laboratory and ancillary data. Based on this information, more accurate assessments can be made and improvements and potential cost saving measures can be performed in patient care compared with phone consultation only. Presence at medical rounds provides the opportunity to educate pediatricians. House staff and students improve their knowledge on exposures, ingestion, and envenomations. This collaboration has provided a robust pediatric population for the toxicology fellows easily fulfilling the new ACGME pediatric toxicology consultation requirements.

Hurdles and solutions

Initially, the transition required a culture change. Providers traditionally relied on call center advice and the medical staff was not accustomed to the availability of bedside consultations. After the initiation of the service, primary teams commented on how bedside consults improved patient care, their education and knowledge, and resource utilization. In the first 6 months, initial bedside consultations were limited due to slow credentialing for attendings and fellows, and consults were performed only by attendings when available. Promotion of the service was made through presence on medical rounds, house staff lectures, and educational teaching notes (information regarding exposures and ingestions). Collaboration of hospital executive staff, medical toxicologists from different departments and institutions, supplemented by poison center infrastructure resulted in a robust medical toxicology clinical service at a tertiary care pediatric hospital. Financially, consultations in the first year of the service generated approximately \$22,000 in revenue. Our faculty also performs consultations at the affiliated academic adult institution. Although all billing for the faculty is provided under the same organization, because our faculty represent multiple sections, departments, and hospitals, capturing all consultations and providing accurate billing charges has been a challenge and many were missed by coders. Not all attendings obtained privileges from the start of the service, so many consults were also missed. Continued education to billing services, consultation tracking to ensure accuracy, more consistent faculty coverage, and possible expansion of services to other hospitals should improve revenue.

Future of the service

The constellation of administrative, fellowship, and RPC support was essential for the success of the consulting service. Literature has shown that a medical toxicology service can decrease length of stay, hospital costs, and mortality in poisoning patients.⁸ We plan to evaluate for similar benefits in pediatric hospitals, possibly using multicenter databases such as the national ToxIC. Future endeavors also include an outpatient clinic available for hospital follow up and community referral. Our experience is that a pediatric medical toxicology consultation service is rapidly and enthusiastically accepted by the hospital medical staff, generates revenue, better fellow experience and enhanced utilization of our RPC.

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