BRIEF REPORT

The Secondary Consequences of the COVID-19 Pandemic in Hospital Pediatrics

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ABSTRACT

BACKGROUND AND OBJECTIVES: The coronavirus disease (COVID-19) pandemic has broad implications for children and families. Particular attention has been paid to delays in accessing timely pediatric care leading to unintended morbidity. In this study, we aim to describe the broader spectrum of unintended negative consequences for pediatric patients and families due to recent health care and societal changes.

METHODS: All full-time doctors, dentists, and nurse practitioners working at a tertiary care children's hospital in Canada were surveyed every 2 weeks throughout the initial phase of the COVID-19 pandemic to identify clinical cases in which they perceived a negative outcome associated with hospital or societal changes as a result of the COVID-19 pandemic. Analysis followed a qualitative case series methodology using a narrative synthesis approach to determine similarities and associated themes.

RESULTS: One hundred and forty-one clinicians, representing 26 hospital divisions, reported 57 unique cases in the first 6 weeks of the study. Thematic analysis of the first 50 reported cases was used to identify 6 primary themes focusing on health care quality domains as described by the Agency for Healthcare Research and Quality (safe, effective, patient-centered, timely, efficient, and equitable care).

CONCLUSIONS: In this preliminary case analysis, we describe the broad social and clinical impact of COVID-19 on hospitalized pediatric patients and their families. These themes highlight the unintended consequence on families, siblings, disease diagnosis, and hospital-based care provision. Recognition and understanding of the broad implications of the COVID-19 pandemic are necessary as we strive to deliver safe, high-quality, family-centered pediatric care in this new era.

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Drs Diskin and Orkin conceived and designed the study, and performed data and thematic analysis; Ms Palmar supported study implementation, including survey design, distribution, and management of data; Dr Agarwal contributed to the interpretation of results and thematic analysis; Dr Friedman conceived and designed the study supervised the analysis of the work, thematic analysis and project conception; and all authors discussed the results and contributed to the final manuscript.

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The experience and delivery of health care has changed significantly throughout the coronavirus disease (COVID-19) pandemic.[1] Safety measures introduced initially to ensure the preservation of hospital capacity and manage infectious spread have included a reduction in nonessential clinical activity (eg, cancellation of nonemergency surgeries and significant reductions to in-person ambulatory care). In March 2020, during the first month of the pandemic at our tertiary care children's hospital in Canada, the inpatient hospital census was reduced by 30% and attendance at the emergency department was reduced by 57% compared with the same period in 2018 and 2019 (The Hospital for Sick Children, unpublished data, 2020). A reduction in commonly transmitted infectious illnesses due to physical distancing and closure of daycares and schools may potentially explain part of the decrease noted. However, recent data suggest that pandemic-related health care changes have led to delays in providing health care services and individual variations in health-seeking behaviors, leading to delays in accessing timely pediatric medical care and associated morbidity.[2–4]

The consequences of the societal and clinical care changes due to the COVID-19 pandemic are likely much broader than solely delays in health care access. They are presumed to impact the overall quality of hospital care experienced by patients and families, with large shifts to virtual care and visitor and caregiver policy changes.[5,6] Understanding the COVID-19 pandemic's impact beyond delayed presentation is essential if we are to ensure that appropriate strategies and policies are in place, which will balance the safety of our patients, families, and staff with the ongoing provision of high-quality, patient-centered care practices in our hospitals. The primary objective with this study is to describe the unintended negative consequences of the COVID-19 pandemic on hospitalized children and their families.

METHODS

This study was performed at a tertiary care hospital in Canada by using a qualitative multiple case study design with descriptive thematic analysis. Physicians, dentists, and advanced practice nurses ($n = 1727$) were contacted by e-mail every 2 weeks beginning May 25, 2020. We invited clinicians to complete a survey asking (1) demographic information and (2) to identify patients they perceived to have experienced a suboptimal quality of care or health-related outcomes related to changes that had occurred as a result of the COVID-19 pandemic (Supplemental Table 3). A chart review of each case was conducted to further characterize it (Supplemental Table 4).[7] Case studies are valuable in enhancing understanding of a multifaceted issue in its real-life context,[8] similar to pediatric hospital care during the COVID-19 pandemic in this study.

Study data were collected and managed by using the Research Electronic Data Capture, a secure, web-based software platform designed to support data capture for research studies.[9,10]

Analysis followed a qualitative case series methodology with themes categorized by the 6 domains of health care quality described by the Agency for Healthcare Research and Quality.[11] In this brief report, we summarize the analysis at 6 weeks, performed to identify trends that allowed for early modifications of hospital-based care practices in our institution and further afield as we prepare for the next stages of the pandemic. The duration of the entire study is 3 months. Ethics approval was obtained from the hospital's institutional review board (no. 1000070386).

RESULTS

One hundred and forty-one clinicians (see Table 1), representing 26 hospital divisions, reported 57 unique cases in the first 6 weeks of the study. Seven cases were excluded because of incomplete details. The highest numbers of reported cases were from pediatric medicine (16) and hematology and oncology (10). Cases were related to inpatient care ($n = 23$), outpatient care ($n = 14$), and the emergency department ($n = 3$). Case analysis of the first 50 reported unique cases revealed 6 primary themes focused on safe, effective, patient-centered, timely, efficient, and equitable care, reflecting the 6 domains of health care quality as described by the Agency for Healthcare Research and Quality.[11] In Table 2, we outline the themes with illustrative case examples.

Clinical cases submitted described delays in seeking medical attention leading to preventable intensive care admissions and delayed diagnosis and treatment of life-threatening diseases, including cancer, ruptured appendicitis, diabetic ketoacidosis, and metabolic disease "crises." Clinical cases show a significant change in the care provided, with family separation and the associated disruptions of natural support structures often at pivotal times, including disclosure of life-altering diagnoses and even death. For example, cases highlighted that siblings were often excluded as visitors and subsequently absent at end of life. An additional consequence of visitor restrictions in other institutions included families' inability to transfer expressed breast milk to the NICU.

Other cases highlighted the challenges associated with virtual care, including an inability to complete physical examination and instances in which virtual care is inappropriate (eg, a clinician described the challenge in establishing a therapeutic alliance sufficient to provide mental health support for a child with significant anxiety).

Last, cases highlighted broad pandemic-related changes to other organizations (eg,

TABLE 1 Participant Demographics ($n = 141$)

Characteristic	*n*	%
Participant		
Full-time physician	95	67
Trainee	35	25
Advanced practice nurse	11	8
y in practice		
<5	39	28
5–10	31	22
10–30	57	40
>30	14	10
Departments		
Pediatrics	95	67
Perioperative services	37	26
Diagnostic imaging	4	3
Psychiatry	4	3
Laboratory medicine	1	1

TABLE 2 Examples of the Impact of the COVID-19 Pandemic in a Pediatric Hospital Categorized by the 6 Domains of Health Care Quality[4]

Domain of Care	Mechanism of Impact	Example
Safe[a]	Limitations of virtual care ($n = 6$)	During follow-up after a recent neurosurgical intervention, the physical examination findings of skin infection and associated collection are not appreciated during a virtual appointment
	—	Difficulty establishing a therapeutic relationship when providing care to a child with mental health issues, including selective mutism, social anxiety disorder, and learning disability
Effective[b]	Restrictions to care ($n = 2$)	Mothers of out-born newborns are unable to transport expressed breast milk to NICU because they are not allowed visitors after delivery
	Homecare for children with medical technology ($n = 1$)	Additional planning required to support the discharge of child with medical complexity and multiple technology dependencies (ventilator-dependent, tracheostomy, enterostomy feeds) with parental hesitancy in having home care nurses in the home
Patient-centered[c]	Change in visitor policy impacting child or youth ($n = 4$) caregivers or family ($n = 4$)	Siblings not as present during end-of-life care as previous, eg, sibling visited on 1 occasion during 28-d hospital stay
	—	Disclosure of important information, including new diagnoses to 1 parent, the other joining by telephone
	Screening for COVID-19 impacting child experience ($n = 3$)	Multiple SARS-CoV-2 swabs required during a hospital stay to facilitate procedures and investigate new instances of fever, eg, 4 swabs required during a month in a child receiving chemotherapy causing distress
Timely[d]	Postponement of elective procedures ($n = 12$)	The risk of infection associated with the delayed removal of a Portacath that is no longer required.
	Delayed acute presentation ($n = 15$)	A child presented with a 5-wk history of dyspnea, presyncope, and progressive dysphagia and a large mediastinal mass was identified on their presentation
	Deferral of care or follow-up ($n = 12$)	Parental deferral of routine follow-up with delayed identification of complications after corneal transplant
Efficient[e]	Screening for COVID-19 impacting hospital flow ($n = 5$)	Admission required to complete investigations, eg, imaging, delayed as awaiting SARS-CoV-2 swab result
Equitable[f]	Reduced child care availability ($n = 2$)	Commencement of treatment eg, chemotherapy deferred on account of disruption of child care and school for other siblings
	Closure of supports for family, eg, overnight accommodation ($n = 2$)	Increased costs associated with admission (eg, $135 a night for a hotel room for second caregiver because only 1 caregiver is permitted at bedside and usual supports are closed)

[a] Avoiding harm to patients from care intended to help.
[b] Provision of evidence-based care.
[c] Incorporates a patient's preferences, needs, and values into their care.
[d] Avoidance of harmful delays for patients and health care providers.
[e] Avoidance of waste.
[f] Care does not vary in quality because of personal characteristics, eg, ethnicity, geographic location, socioeconomic status.

challenges with discharge planning for children with medical complexity because of limitations in home care provider availability).

DISCUSSION

In our study, we suggest that hospital measures designed to mitigate the impact of COVID-19 result in a broad range of adverse health quality outcomes. With our findings, we validate recent reports of delays in health care access,[2–4] including cases in which delay in presentation likely contributed to more severe illness that required additional treatment.[7] The COVID-19 pandemic and efforts to mitigate its consequence, including changes in hospital operations, have impacted the quality of care provided to children. Understanding the entire impact is necessary as we continue to try and find strategies to optimize the safety, quality and outcomes of the care we provide to hospitalized children in this new era.

Similar to other research, clinical cases highlighted a change in health-seeking behavior based on concern over exposure to COVID-19.[7] As we anticipate additional waves of the pandemic,[12] this fear of exposure to COVID-19 needs to be incorporated into communications with the public. We must acknowledge concerns, describe hospital safety practices, and emphasize the importance of seeking prompt care if needed.

In addition, the cases reported highlight the breadth of the negative impacts on other domains of care, including family and patient-centered care, a core tenant of pediatric hospital-based care. Our institution changed the visitor policy significantly in mid-March 2020. Staff and visitors were screened on arrival at the hospital. One caregiver was allowed to be present at the bedside. This resulted in

family separation and disruption of associated support structures. This was challenging for patients, families, and staff, mainly when there was a need for communication with both parents (eg, disclosing a life-altering diagnosis). An exemption policy was introduced in March 2020 to support families during these pivotal moments. By July 2020, the visitor policy was amended to allow 2 caregivers at the bedside. Central to the successful implementation of this policy revision was the education of staff and visitors, including exact expectation-setting (eg, screening on entry to the building, restricted movements while awaiting severe acute respiratory syndrome coronavirus 2 [SARS-CoV-2] swab results, and masking). Mandatory masking was introduced at our institution in April 2020 and subsequently aligned with city by-laws.[14] This is an illustration of how our institution's policies are frequently changing in 2020, reflecting both the constant adjustments associated with living and working during a pandemic and the acquisition of new evidence on which to base practice. Nimble revision of policies and workflows are required with clear timely communication to staff and families so that institutions can respond appropriately to the pandemic while still engaging staff and families.

The pandemic has resulted in a dramatic shift toward virtual care, especially in the ambulatory setting. This has been identified as a silver lining of the pandemic with the potential for enhanced access to care given the increased convenience and satisfaction described.[14] Within this study, however, clinical cases provided examples of the limitations of virtual-only care. For example, when the physical examination is pivotal to clinical decision-making. Having the potential for in-person visits as needed is crucial as we plan for the pandemic's next wave.

This study focused on the unintended negative consequences of the COVID-19 pandemic. Limitations of our study include the generalizability of our results due to the single-center design. Extrapolation of these results to alternative contexts requires cautious interpretation as the response to the pandemic varies with jurisdiction.[14] Although certain aspects of an individual hospital's response to the COVID-19 pandemic are similar (eg, reduction in nonessential activity), each region's unique health care system requires consideration.[15] Our case finding methodology did not provide a denominator or frequency for these events. We have not compared similar experiences (eg, impact of delays in presentation or deferrals of elective procedures before March 2020). The results are descriptive and preliminary and represent frontline hospital clinicians' perceptions and are, therefore, subject to bias.

CONCLUSIONS

Recognition of the breadth of negative consequences resulting from changes in health care and societal services due to the COVID-19 pandemic is essential to inform strategies to minimize unintended harm. Institutions need to be mindful that policies to mitigate infection spread (eg, visitor restriction) can impact patient and family-centered care. Careful consideration of each policy change's impact and associated communication with staff and the public including the involvement of patient and family advisors could improve the care received by hospitalized children and their families during the COVID-19 pandemic. This will be key as hospitals strive to identify a new equilibrium that balances infection control measures and safety for patients and staff with high-quality, effective, timely, efficient, and equitable family and child-centered care.

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