SPMC JHCS

BRIEF REPORT

Perioperative clinical profile of newborn patients who underwent surgical management for congenital malformations of the gastrointestinal tract: brief report

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Life-threatening congenital anomalies, which constitute neonatal surgical emergencies, can result in death or severe disability if not treated immediately at birth. Prompt recognition and treatment of these emergencies, which include initial stabilization following birth, can lead to better patient outcomes.[1 2] The perioperative period refers to the time interval encompassing the surgical procedure. This includes three stages: preoperative phase (from the time the patient arrives up to surgery), operative phase (the surgical period), and postoperative phase (until either the patient has expired or has been discharged).[3 4] Optimizing patient flow is one of the greatest challenges facing health care today. Increased waiting time, delays, and cancellations are frequently encountered by patients, as well as health care workers, that they now believe that these problems are a part of the care process.[5 6] Monitoring the perioperative duration, especially for life-saving procedures during neonatal emergencies, is the first step towards providing safe and efficient patient care while maximizing hospital resources.[7]

Southern Philippines Medical Center (SPMC) currently has a set of time-specific surgical protocols from admission to discharge. However, these protocols are not age-specific. Since SPMC is an end-referral institution in Mindanao for patients requiring neonatal surgery, it is imperative that surgeons gain a thorough understanding of patient flow from admission to discharge, and the occurrence of morbidity and mortality among these patients during admission, in order to effectively implement and possibly improve these protocols in the future. The aim of this study was to describe the perioperative clinical profile of newborn patients who underwent surgical management for congenital malformations of the gastrointestinal (GI) tract.

In our institution, neonatal surgery is considered an emergency procedure that is managed accordingly by the Pediatrics, Pediatric Surgery, and Anesthesiology services as soon as the diagnosis is established. The Section of Pediatric Surgery at SPMC caters to an annual average of 89 patients with congenital malformations of the GI tract from 2017 to 2019. For this descriptive study, we collected data retrospectively from the medical records of patients admitted in the neonatal and pediatric intensive care units of SPMC who underwent surgery in the institution from 2015 to 2019 after being diagnosed with a congenital malformation of the GI tract. We excluded patients ≥29 days old, as well as those who were diagnosed with and/or who underwent surgery for multiple congenital anomalies. We were able to gather the data of a total of 60 patients—15 patients each for congenital diaphragmatic hernia (CDH), esophageal atresia (EA), gastroschisis (GS), and imperforate anus (IA)—for this study.

From the medical records, we collected data on the patient's sex, age upon admission, and preoperative diagnosis. We also collected data on the preoperative time (the time interval in hours from admission to surgical cutting), the operative time (the time interval in minutes from surgical cutting to last stitch), the postoperative time (the time interval in days from last stitch to discharge), and the total length of hospital stay (the time interval in days from admission to discharge). Further, we also gathered data on the occurrence of morbidities during admission (neonatal sepsis, health-care associated pneumonia, fungal infection, others) and/or death, as well as the patients' disposition upon discharge. Among patients who died, we also determined the median time in days from end of surgery (last stitch) to death.

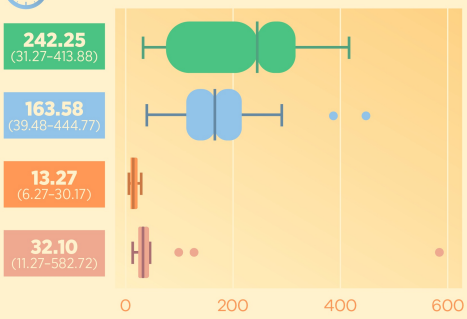
Overall, there were 38 males and 22 females included in the study. Specifically, there were 6 males and 9 females in the CDH group, 13 males and 2 females in the EA group, 8 males and 7 females in the GS group, and 11 males and 4 females in the IA group. The overall median age of the 60 patients upon admission was 4.5 (range: 1–28) days. The median ages of the patient groups upon admission were 11 (2–25) days for CDH, 17 (4–28) days for EA, 1 (1–1) day

Perioperative clinical profile of **NEWBORN PATIENTS** who underwent surgical management for

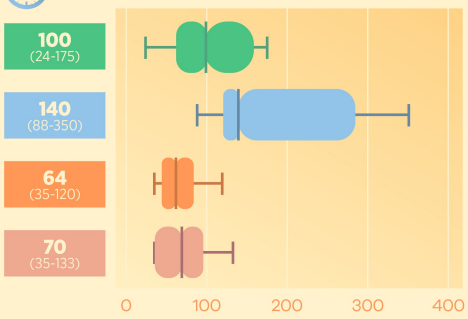
CONGENITAL MALFORMATIONS OF THE GASTROINTESTINAL TRACT: BRIEF REPORT

Congenital diaphragmatic hernia (CDH) *n=15*
Esophageal atresia (EA) *n=15*
Gastroschisis (GS) *n=15*
Imperforate anus (IA) *n=15*

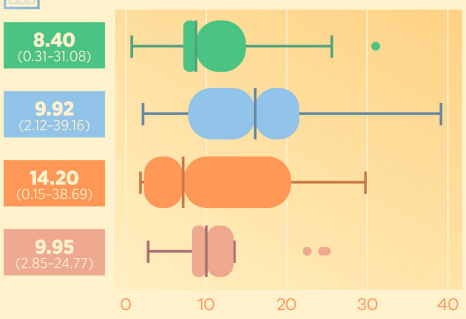
PREOPERATIVE *(median time in hours)*



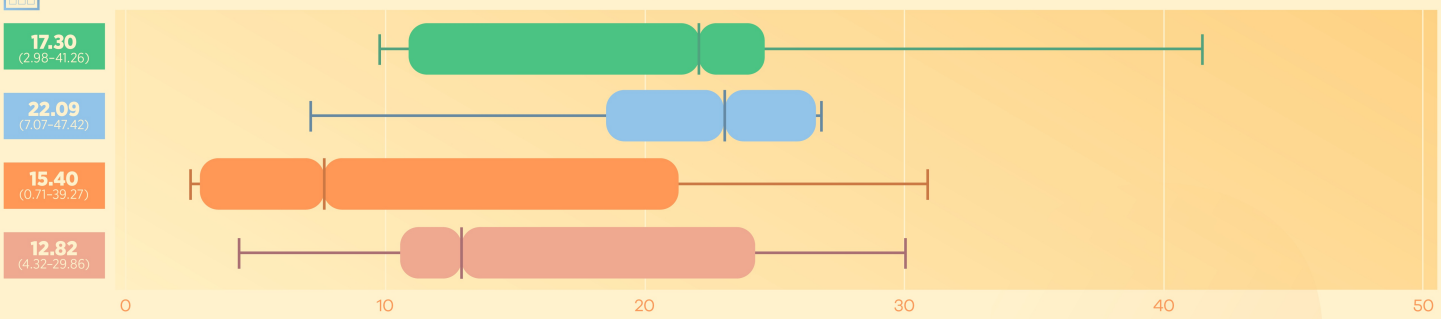
OPERATIVE *(median time in minutes)*



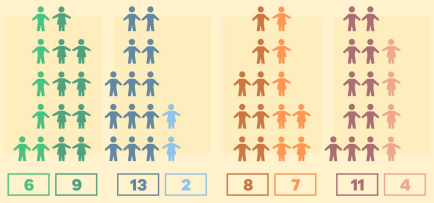
POSTOPERATIVE *(median time in days)*



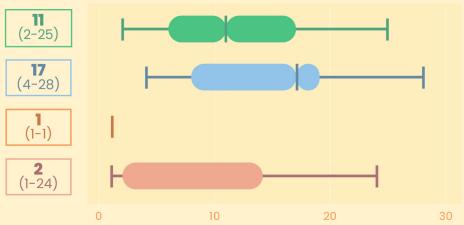
TOTAL LENGTH OF HOSPITAL STAY *(median time in days)*



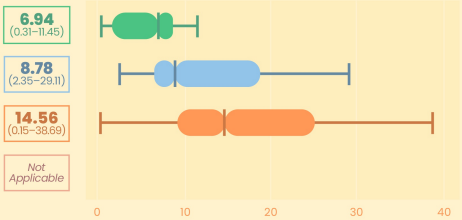
Sex distribution



Age upon admission *(median age in days)*



Time from end of surgery to death among those who expired *(median time in days)*



Morbidities

One patient may have more than one morbidity

Proportion of morbidity, mortality, and improvement upon discharge of patients

MORBIDITY	5	8	11	0
MORTALITY	5	7	11	0
IMPROVEMENT UPON DISCHARGE	10	8	4	15

for GS, and 2 (1–24) days for IA. Overall, the median preoperative time was 47.22 (6.27–582.72) hours, the median operative time was 95 (24–350) minutes, the median postoperative time was 9.94 (0.15–39.16) days, and the median total length of hospital stay was 17.16 (0.71–44.42) days. The median preoperative time was 242.25 (31.27–413.88) hours for CDH, 163.58 (39.48–444.77) hours for EA, 13.27 (6.27–30.17) hours for GS, and 32.1 (11.27–582.75) hours for IA. The median operative time was 100 (24–175) minutes for CDH, 140 (88–350) minutes for EA, 64 (35–120) minutes for GS, and 70 (35–133) minutes for IA. The median postoperative time was 8.40 (0.31–31.08) days for CDH, 9.92 (2.12–39.16) days for EA, 14.20 (0.15–38.69) days for GS, and 9.95 (2.85–24.77) for IA. The median total length of hospital stay was 17.30 (2.98–41.26) days for CDH, 22.09 (7.07–47.42) days for EA, 15.40 (0.71–39.72) days for GS, and 12.82 (4.32–29.86) days for IA.

Of the 60 patients, 24 had at least one morbidity during admission, and 23 died. There were 5 patients who had morbidity during admission in the CDH group, 8 in the EA group, and 11 in the GS group. There were 5 deaths in the CDH group, 7 deaths in the EA group, and 11 deaths in the IA group. There was no morbidity or death in the IA group. The three most common morbidities during admission were neonatal sepsis 15/60 (25%), ventilator-associated pneumonia 6/60 (10%), and fungal infection 6/60 (10%). Among the patients who died, the median time from end of surgery to death was 6.94 (0.31–11.45) days for CDH, 8.78 (2.35–29.11) days for EA, and 14.56 (0.15–38.69) days for GS. All in all, there were 10 patients whose conditions improved upon discharge in the CDH group, 8 in the EA group, 4 in the GS group, and 15 in the IA group.

In this study, we found out that patients with congenital malformations of the GI tract are usually admitted in our institution during their first week of life. Patients stayed in the hospital for 2.5 weeks, 27.84% of which was spent on preoperative care, 0.40% on operative care, and 71.76% on postoperative care. The data presented in this study happened before the WHO declaration of a COVID-19 pandemic in March 2020. During the height of the SARS-CoV-2 infection, and even today, more than two years after the start of the pandemic, the patient flow within our institution for non-COVID-19 cases changed several times to comply with the evolving mandates and regulations related to the pandemic. These changes included the addition of mandatory COVID-19 screening prior to admission or any procedure with patient contact, the mandatory isolation of patients presenting with COVID-19-like symptoms, and the capacity limitations in patient beds and operating theaters, to name a few. The same health care modifications could have affected the outcomes of patients with congenital GI malformations. In the future, a formal comparison of perioperative time intervals and patient outcomes in different health care contexts could point out specific aspects of patient flow that need action for improvement. Further studies focusing on the identification of specific risks and contributory factors affecting delays in perioperative care and patient outcomes would also be useful in addressing the health care needs of these patients. Ensuring an efficient health care pathway should be an essential part of a wider effort to improve the quality care for patients with life-threatening conditions, such as those with congenital anomalies of the GI tract.

Contributors

KPR and NMA contributed to the conceptualization of this article. Both authors wrote the original draft, performed the subsequent revisions, approved the final version, and agreed to be accountable for all aspects of this report.

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Ethics approval

This study was reviewed and approved by the Department of Health XI Cluster Ethics Review Committee (DOH XI CERC reference P20052902).

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Competing interests

None declared

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