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Impact of COVID-19 on the Number of Surgical Cases at a Tertiary Care Hospital in Karachi, Pakistan

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Abbreviations: SPSS: Statistical Package for the Social Sciences; COVID-19: Coronavirus Disease 2019; PHEIC: Public Health Emergency of International Concern; WHO: World Health Organization; SMBB: Shaheed Mohtarma Benazir Bhutto; IRB: Institutional Review Board; DUHS: Dow University of Health Sciences; HIMS: Hospital Information Management System; NHS: National Health Service; PPE: Personal Protective Equipment

ABSTRACT

Objective: The aim of this study was to find out the decline in the number of surgical cases done during this pandemic, and the effect on number of oncological procedures performed.

Design: Observational study.

Place and Duration of Study: The study was conducted at Dr. Ruth K. M. Pfau Civil Hospital Karachi, for ten months from October 2019 till July 2020.

Methodology: First five months were taken as pre-Covid state (October 2019-February 2020) and next five as the Covid state (March 2020- July 2020). Data was analyzed using IBM Statistical Package for the Social Sciences (SPSS) version 23.0 and tables were constructed using Microsoft Excel® 2016. Results for quantitative variable were presented as frequencies and percentages. Independent T test was used to compare the monthly means of pre-Covid and Covid months. The p-value < 0.05 was considered significant.

Results: The total number of emergency cases performed in these ten months were 2190 out of which 1419 (64.8%) cases were performed during pre-Covid state and 771 (35.2%) cases were performed during Covid state. The total number of elective cases performed were 3184 out of which 2750 (86.4%) cases were performed during pre-Covid state while 434 (13.6%) cases were performed during Covid state.

Conclusion: The pandemic has drastically affected the number of surgical cases performed in both elective and emergency theatres. In addition to this the number of oncological procedures performed have also declined significantly. As surgeons, we need to devise ways to address this issue and prevent further backlog.

Introduction

Coronavirus Disease 2019 (COVID-19) emerged in the Wuhan city of China in December 2019 [1]. With rising number of cases and reported deaths, on 30th January 2020, the World Health Organization (WHO) declared this outbreak as Public Health Emergency of International Concern (PHEIC) [2]. In Pakistan, first case of COVID-19 was confirmed on 26th February 2020 in Karachi, Sindh [3]. Soon after which it was declared as a pandemic by the WHO on 11th March 2020 [4]. The disease has left negative impacts on various sectors of human life and has led to serious socioeconomic implications globally [5]. As the number of cases started to rise, outnumbering the bed capacity of healthcare facilities, it was advised to abandon all elective work at the hospitals. This was done to save the healthcare resources and protect healthcare personnel from unnecessary exposure. On 13th March 2020, The American College of Surgeons issued a guideline recommending that all healthcare facilities shall review all scheduled elective procedures

with a plan to minimize, postpone or cancel them. This was to be done until the healthcare infrastructure was confident to support any overwhelming critical patient care needs [6]. Likewise, in Pakistan, all sort of elective work (out-patient clinics and elective procedures) were suspended from the mid of March 2020 as Pakistan was also expecting to hit the pandemic peak [2]. The main purpose behind this decision was to decrease the exposure of healthcare workers and save the human and material resources.

Although this proved helpful in combatting the COVID-19 emergency, but in the long run it has left a large impact. Dr Ruth K.M. Pfau Civil Hospital Karachi, which caters thousands of patients every day and offers all sorts of advanced surgical procedures to the patients free of cost was also affected. Hundreds of elective surgical procedures were cancelled, and cancer surgeries were also restricted. In order to estimate the difference in the surgical cases done before the pandemic and during the pandemic, we carefully planned this study. The aim of this study was to find out the decline in the number of surgical cases done during this pandemic, and the effect of the pandemic on number of oncological procedures performed. These numbers are not mere figures but rather depiction of the patient suffering.

Methodology

An observational study was conducted at Dr Ruth K.M. Pfau Civil Hospital Karachi and Shaheed Mohtarma Benazir Bhutto (SMBB) Accident Emergency and Trauma Centre, Karachi. The study was conducted for a total duration of ten months from October 2019 till July 2020. Ethical approval to conduct this study was taken from Institutional Review Board (IRB) of Dow University of Health Sciences (DUHS). Cases performed from October 2019 to February 2020, were considered as pre-Covid state and from March 2020 till July 2020 as Covid state. All surgeries including elective and emergency procedures, conducted during the study period were included. Data was collected from two sources. For elective surgical procedures, data was collected from Hospital Information Management System (HIMS) record at the Dowite's 87 Operation Theatre Complex. For emergency procedures, data was collected from data maintained in HIMS at SMBB Trauma center theatre. A Performa was filled out for all participants of the study. Data was entered and analyzed using IBM Statistical Package for the Social Sciences (SPSS) version 23.0 (IBM SPSS Statistics for Windows, Armonk, NY) and tables were constructed using Microsoft Excel® 2016 (Microsoft Corp., Redmond, WA). Results for qualitative variables were presented as frequencies and percentages. Chi-square was used to compare the frequencies of pre-Covid and Covid cases. The p-value < 0.05 was considered significant in all cases.

Results

(Table 1) shows the demographic characteristics of patients presenting during this 10-month period. There were more males (71.0%) than females (29.0%) during both pre-covid and covid period and there was no significant difference observed. The mean age of patients was 35.2 ± 16.2 years. The total number of emergency cases performed in these ten months (October 2019-July 2020) were 2190 out of which 1419 (64.8%) cases were performed during Pre-Covid state (October 2019-February 2020) and 771 (35.2%) cases were performed during Covid state (March 2020-July 2020) (Figure 1). The total number of Elective cases performed were 3184 out of which 2750 (86.4%) cases were performed during Pre-Covid state (October 2019-February 2020) while 434 (13.6%) cases were performed during Covid state (March 2020-July 2020) (Figure 2). (Table 1) Demographics (Table 1) depicts the frequencies and percentages of emergency procedures performed before and during the pandemic, highlighting the major procedures that are performed, which included debridement, appendectomy, laparotomies and incision and drainage procedures. A significant difference was observed between exploratory and traumatic laparotomy and incision and drainage procedure before and during the pandemic ($p<0.05$) (Table 2). (Tables 3 & 4) further elaborate the monthly frequencies and percentages of the emergency surgeries performed for both pre-Covid and Covid state. It was observed that Exploratory Laparotomy was the most common procedure performed among emergency surgeries (30.6%, n=671) followed by Incision and Drainage (22.7%, n=498), Appendectomy (14.9%, n=326) and Debridement (9.4%, n=205). Traumatic surgeries were less commonly performed than non-trauma surgeries.

Table 1.

Demographics	Pre-COVID	COVID	P value
Gender			0.24
Male	995 (70.1%)	559 (72.5%)	
Female	424 (29.9%)	212 (27.5%)	
Age (Mean ± standard deviation)/years	35.2 ± 16.6	35.2 ± 15.4	0.94

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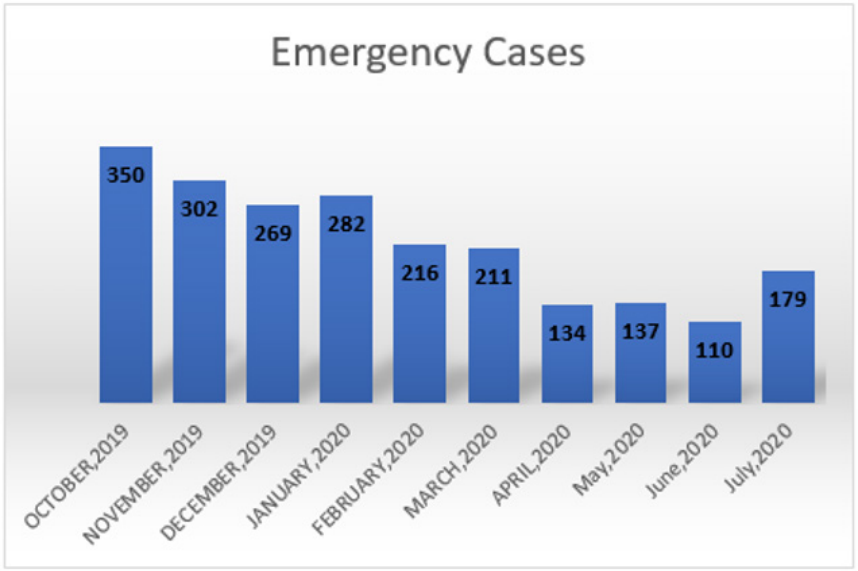

Figure 1: Emergency cases during pre-Covid and Covid state.

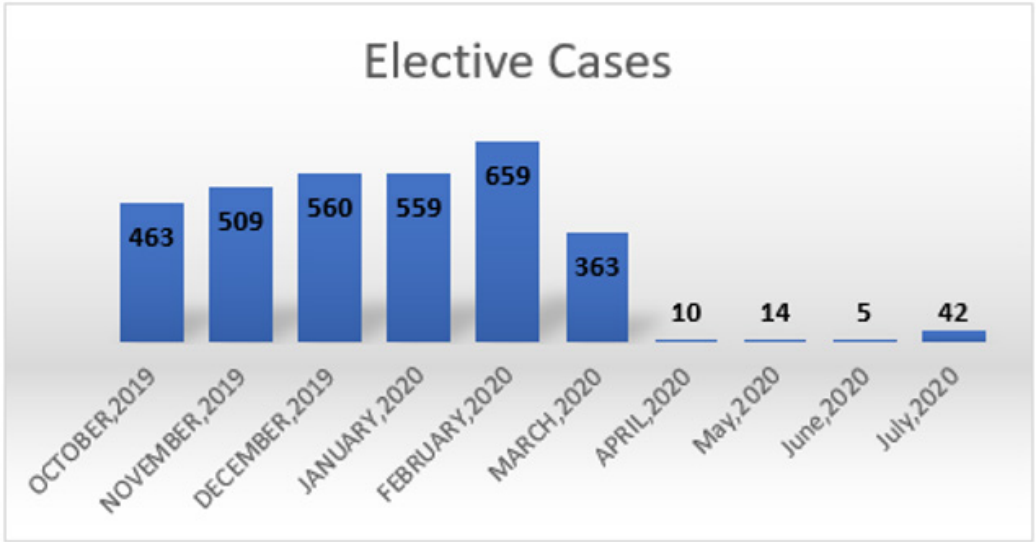

Figure 2: Elective cases during pre-Covid and Covid state.

Table 2: Comparison of monthly frequencies of emergency cases during pre-Covid and Covid period.

	Pre-covid	COVID	Total	p-value
Debridement	145 10.20%	60 7.80%	205 9.40%	0.062
Appendectomy	216 15.20%	110 14.30%	326 14.90%	0.55
Exploratory laparotomy	398 28.00%	273 35.40%	671 30.60%	<0.001*
Incision and drainage	355 25.00%	143 18.50%	498 22.70%	0.001*
Trauma laparotomy	75 5.30%	75 9.70%	150 6.80%	<0.001*
Other procedures	230 16.20%	110 14.30%	340 15.50%	0.23

Note: *p-value<0.05 considered as significant

Table 3: Monthly frequency of emergency cases during pre-Covid state.

	PRE-COVID						
Month	**Debridement**	**Appendectomy**	**Exploratory laparotomy**	**Incision and drainage**	**Trauma laparotomy**	**Other**	**Total**
October	37 25.50%	38 17.60%	104 26.10%	102 28.70%	14 18.70%	55 23.90%	350 24.70%
November	34 23.40%	45 20.80%	88 22.10%	72 20.30%	15 20.00%	48 20.90%	302 21.30%
December	30 20.70%	54 25.00%	65 16.30%	68 19.20%	13 17.30%	39 17.00%	269 19.00%
January	29 20.00%	37 17.10%	78 19.60%	60 16.90%	18 24.00%	60 26.10%	282 19.90%
February	15 10.30%	42 19.40%	63 15.80%	53 14.90%	15 20.00%	28 12.20%	216 15.20%

Table 4: Monthly frequency of emergency cases during Covid state.

	DURING COVID						
Month	**Debridement**	**Appendectomy**	**Exp laparotomy**	**Incision and drainage**	**Trauma laparotomy**	**Other**	**Total**
March	19 31.70%	37 33.60%	75 27.50%	41 28.70%	13 17.30%	26 23.60%	211 27.40%
April	7 11.70%	25 22.70%	55 20.10%	20 14.00%	9 12.00%	18 16.40%	134 17.40%
May	4 6.70%	14 12.70%	59 21.60%	29 20.30%	11 14.70%	20 18.20%	137 17.80%
June	6 10.00%	12 10.90%	37 13.60%	19 13.30%	20 26.70%	16 14.50%	110 14.30%
July	24 40.00%	22 20.00%	47 17.20%	34 23.80%	22 29.30%	30 27.30%	179 23.20%

Discussion

During this Covid-19 pandemic, a significant decline in both the elective and emergency cases have been reported in our study. As the first wave of the pandemic hit the world, elective surgical practices were restricted worldwide. The American College of Surgeons recommended to postpone or cancel all elective surgeries in March 2020 [6]. Similarly, National Health Service (NHS) hospitals were advised to postpone elective surgeries for three months to increase the hospital's capacity for the care of Covid positive patients [7]. It was advised by The Royal College to manage emergency surgical cases like acute appendicitis and acute cholecystitis conservatively where possible [8]. While the procedure continued to take place at our hospital setting, there was no statistical difference observed in appendectomies before and during the pandemic ($p>0.05$). Rait, et al. [9] reported an 86% decrease in cases of emergency surgery compared to the months before the quarantine, and the most frequently performed surgical procedure was appendectomy [9]. Richmond BK, et al. [10] demonstrated in their study that the Covid-19 pandemic has had a massive impact on the surgical practice and on the well-being of surgeons in the South Eastern surgical congress, with surgeons reporting cancellation rate of elective surgery around 98.5% [10]. To avoid the spread of this disease among surgeons and patients, out-patient's clinics were also suspended, adding up to the decline in surgical procedures performed. Spinelli, et al. [11].

Noted that most outpatient clinics were suspended in Italy and scheduled patients were asked not to come to the hospital, and their visits were postponed if they had fever, cough, or any contact history with the Covid positive patient in the last two weeks [11]. Even during the pandemic, trauma incidences are inevitable [12]. In our study, greater proportion of trauma laparotomies were observed during the covid state (9.7%) as compared to pre-covid period (5.3%), and the difference was statistically significant, possibly owing to the decrease in number of non-traumatic surgeries during the pandemic This is likely due to non-presentation or delay in presentation of non-traumatic cases during the lockdown state, In this pandemic, surgeons aim to provide timely surgical care to their patients presenting with emergency surgical conditions along with optimal use of resources, e.g., hospital and intensive care unit beds, Personal protective equipment (PPE), ventilators, and preserving the health of caregivers. Surgeons should use their sound judgment while addressing acute surgical conditions. Many infections and abscesses, which are small, can be treated using local anesthesia in the office, without using the operation theatre facilities. Serious

acute surgical issues, e.g., perforated viscus or gut ischemia, however, must undergo emergent surgery [13].

The oncological surgeries carried out as per our survey were significantly reduced in the Covid state (340 vs 57, Pre-Covid vs Covid). There could be several reasons for this huge difference including lockdown, closed outpatient facility, a limited number of admissions, or patients' fear of acquiring Covid from hospitals during the pandemic. Similar findings have been observed globally. Greenwood reports that in England in May 2020, -37% patients had their oncological treatment started when compared to May 2019 [14]. Oncological procedures, however, shall always be a priority and efforts shall be made to offer better healthcare to the cancer patients. Standard guidelines shall be established regarding the Oncological Surgeries and surgeons shall be made aware of them. Sud, et al. [15] state that delay in surgery in cancer patients could result in increased mortality, and any blockage in the pathway of management of these patients should be removed, and these cases should be managed in the same way as before this Covid pandemic [15].

Conclusion

Covid-19 pandemic is a threat to every aspect of patient management. Surgical treatment is also affected by this pandemic. Both elective and emergency surgeries are significantly reduced in number including oncological surgeries. However, cancer patients cannot wait, and they must be treated with priority even during the Covid pandemic. A strategy should be made to prevent the overburden we will face once this pandemic is over.

Conflict of Interest

Authors have no conflict of interest to declare.

Disclosure

None.

Funding

None.

Ethical Approval

Institutional Review Board (IRB) of Dow University of Health Sciences (DUHS).

Authors' Contribution

- AS: Study conception, writing of article, critical review, revision.
- MA: Study conception, literature review, writing of article, critical review, revision.
- AZ: Data analysis, writing of article.
- SS: Data collection, literature review, writing of article.
- MR: Data collection, literature review, writing of article.
- SS: Critical review, revision, writing of article.

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