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Original Research Article

Impact of the coronavirus disease (COVID-19) pandemic on the volume of surgeries and visits to a tertiary urology service

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ABSTRACT

Background: The coronavirus disease (COVID-19) pandemic has caused countries and various sectors of the society to initiate measures to prevent its rapid spread, and thus, numerous political and hospital authorities have adopted measures to care for affected patients, limiting the assistance of several hospital sectors, including the urology service of the Hospital Geral de Fortaleza (HGF).
Methods: A retrospective quantitative descriptive study was conducted by analyzing the data of the years 2019 and 2020 (January to June) rescued through the Center for patient safety and hospital quality (CPSHQ) of the HGF, correlating them through methods and statistical and numerical analyses with the aid of Excel and Epi Info programs, to compare and observe the impact of the pandemic in the urology service.
Results: A 26.23% decrease was observed in relation to elective procedures, 25.6% for emergency procedures, 16.57% for minor surgeries, and 46.44% for outpatient consultations when compared to the first semester of 2019 compared to that in 2020.
Conclusions: It is clear that the pandemic has negatively impacted the volume of various HGF urological services, and new studies should demonstrate the consequences of the lack of assistance in the period described.

Keywords: Pandemic, Coronavirus, Urology

INTRODUCTION

Coronavirus disease (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), first reported in December 2019 in the city of Wuhan, has spread rapidly to more than 210 countries and territories worldwide, declared by the World Health Organization as a public health emergency of international interest on January 30, 2020, and, subsequently, on March 11, 2020, a worldwide pandemic.[1-4]

In response to this situation, collaborative measures between countries and different sectors of society were taken to prevent the rapid spread of the disease. However, until then, the advance of the virus resulted in 44,897,520 confirmed cases and 1,179,211 deaths (September 2020).[5]

In this context, numerous political and hospital authorities have adopted measures to care for patients with flu-like symptoms, as well as to reduce the contamination of other hospital sectors, with the restriction of elective outpatient care and the availability of surgical centers and anesthetic recovery rooms. Thus, the services of urology departments changed, requiring adaptations to the management of physical resources and medical staff, the flow of outpatient care, and the performance of elective and emergency surgical procedures. Such changes in hospital indicators

were expected, in this context, at the urology service of the Hospital Geral de Fortaleza (HGF).

Therefore, we conducted a descriptive and comparative study by analyzing hospital data from January to June 2019 in comparison with January to June 2020, evaluating elective admissions, outpatient consultations, number of procedures performed in elective and emergency surgical centers, and procedures performed in the small surgery outpatient clinic.

Our objective in this study, with the comparison of data over similar periods in consecutive years, was to describe the impact of the coronavirus pandemic (COVID-19) on the volume of surgical procedures and visits to a tertiary urology service.

METHODS

A descriptive quantitative study of the retrospective cohort type was conducted, through the objective analysis of data from 2019 and 2020 (available until the month of June), redeemed through the Center for patient safety and hospital quality (CPSHQ) of the HGF. In this case, the number of patients seen at the four HGF urology services (ambulatory consultations, elective surgical center, emergency surgical center, and minor surgery) from January to June 2019 and January to June 2020 were correlated through statistical and numerical analysis methods with the aid of Excel (Microsoft Office) and Epi Info programs using the basic concepts of descriptive statistics, such as the average of numerical values, in addition to exploratory methods, such as clustering for multivariate correlation analysis.[6-8]

The differences between the monthly arithmetic averages of visits in each period of the respective evaluated years were evaluated. Likewise, the number of calls in a given month of the reference year, 2019 were divided by the number of calls in the same corresponding month in the year 2020. Quantitative data are expressed as absolute and percentage values (%). Thus, the index of variation was obtained for the number of people served in each specific service that is part of HGF urology. Thus, multiplying by 100, the percentage of oscillation of these indicators was acquired, the results of which are shown below.

As this is a quantitative descriptive study, there is no need for specific inclusion or exclusion criteria. All patient visits in the defined periods will be included for analysis.

The study was conducted in accordance with national and international laws and was approved by the institutional ethics committee (protocol no. 4.581.804).

RESULTS

Regarding the surgeries performed in the surgical center designated to perform elective procedures (Figure 1), we observed a decline on April 2020, with only one procedure performed at the elective surgical center for that month, in contrast to the 67 procedures in the same month in the previous year, with a steady rate of this pattern in the following months of May and June 2020, compared to the same periods of the previous year. We also verified the percentage of variation in this interval, which took place in April 2020, which is only 1.49% of the number of procedures performed in April 2019. The indicator remained to decline in May and June 2020, at 12.28% and 35.29%, corresponding to a fall of 87.72% and 64.71%, respectively. When comparing data from the second quarter of 2020, the period with the highest COVID-19 cases in Brazil (9), to the first semester of the previous year, we observed an 82.51% drop in the procedures performed in the operating room for elective surgeries in the HGF urology service and a total decrease of 26.23% during the first six months of 2020 in relation to the visits made in the corresponding period of the previous year.

Table 1: HGF urology outpatient consultation from January to June 2019.

Urology ambulatory/monthly services (2019)	Jan	Feb	Mar	Apr	May	Jun	Ambulatory service in the period	Average monthly service per ambulatory in the period
Double J withdrawal	58	25	25	45	33	54	240	40.00
Cystoscopy	7	4	3	4	7	6	31	5.17
Orchiectomy and vasectomy	3	5	2	1	5	7	23	3.83
Other procedures	32	14	13	17	14	25	115	19.17
Urology	327	401	336	356	409	296	2125	354.17
Urinary dysfunction	39	94	51	101	0	79	364	60.67
Oncology urology	25	33	21	47	12	39	177	29.50
Total visits per month	491	576	451	571	480	506	3075	73.21
Average attendance per month	70	82	64	82	69	72		

Table 2: HGF urology outpatient consultations from January to June 2020.

Urology ambulatory/monthly services (2020)	Jan	Feb	Mar	Apr	May	Jun	Ambulatory service in the period	Average monthly service per ambulatory in the period
Double J withdrawal	46	38	41	40	31	40	236	39.33
Cystoscopy	5	4	4	0	5	2	20	3.33
Orchiectomy and vasectomy	7	4	4	0	0	7	22	3.67
Other procedure	21	21	21	3	0	7	73	12.17
Urology	281	268	260	33	33	84	959	159.83
Urinary dysfunction	85	56	68	25	16	49	299	49.83
Oncology urology	0	20	18	0	0	0	38	6.33
Total visits per month	445	411	416	101	85	189	1647	39.21
Average attendance per month	64	59	59	14	12	27		

Table 3: Variation of means of urological care.

Compared service/periods	1st quarter 2020 and 1st semester 2019	2nd quarter 2020 and 1st semester 2019	2nd quarter 2020 and 1st quarter 2020
Outpatient appointments	−17.27%	−75.61%	−70.52%
Minor surgery	−6,74%	−26.40%	−21.08%
Elective surgeries	+30.05%	−82.51%	−86.55%
Emergency surgeries	−28.00%	−23.20%	+6.67%

There is also an increase in the quarterly average of elective surgical care in the first quarter of 2020, in contrast to the same interval in 2019: 238 in 2020 compared to 174 procedures in 2019. However, this growth did not last in the subsequent quarter, with a sudden attenuation in surgeries in this period, setting an average of procedures performed at only 10.67, a significant contraction compared to the average of 79.33 in the first quarter of 2020.

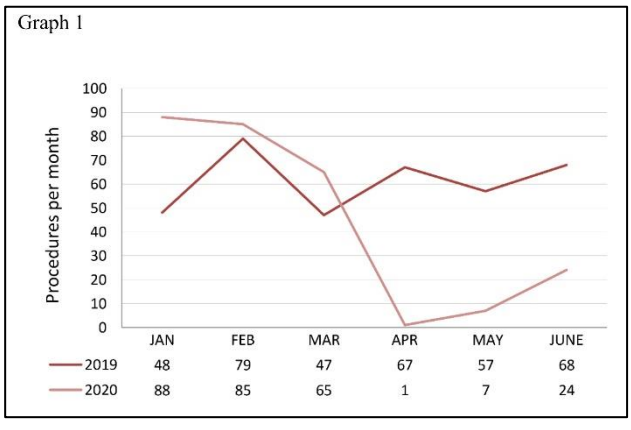

Figure 1: Number of urological procedures performed at the elective surgical center from January to June 2019 and 2020.

When analyzing the surgeries performed in the operating room attributed to emergency procedures, again, we found a drop, but since January 2020, from 51 to 32 surgeries (Figure 2), reflecting a semiannual average of 31 procedures in the first six months of 2020. This finding reveals a decrease of 37.25% in January 2020, corresponding to 62.75% of the total in January 2019. This pattern of decline was maintained in the months of February, March, May, and June 2020 with a shrinkage of 34.21%, 15.38%, 12.50%, 22.50%, and 52.38%, respectively, compared to that in 2019. However, the month of April 2020 presented an exception to this pattern, with a slight increase of 12.5% compared to the previous year, with the conclusion of 45 emergency urological surgeries.

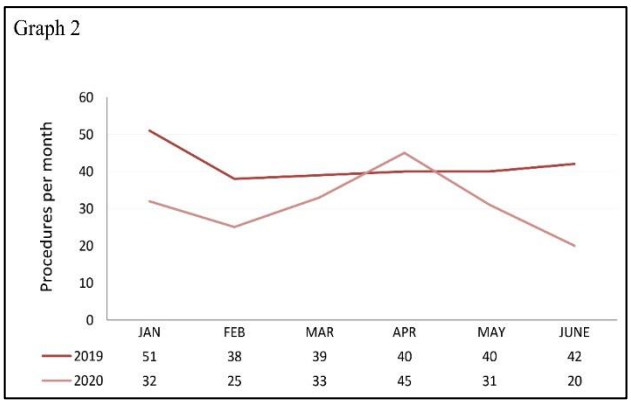

Figure 2: Number of urological procedures performed at the emergency surgical center from January to June 2019 and 2020.

The semiannual indicator of urological surgical procedures performed at the emergency surgical center followed the pattern of decline observed in the elective surgical center, from a total of 250 surgeries in 2019 to 186 in 2020, with a 25.6% decrease in the six months analyzed. These data also indicated new quarterly averages, from 42.67 and 40.67 monthly procedures in the first two quarters of 2019 to 30 and 32 in 2020, respectively.

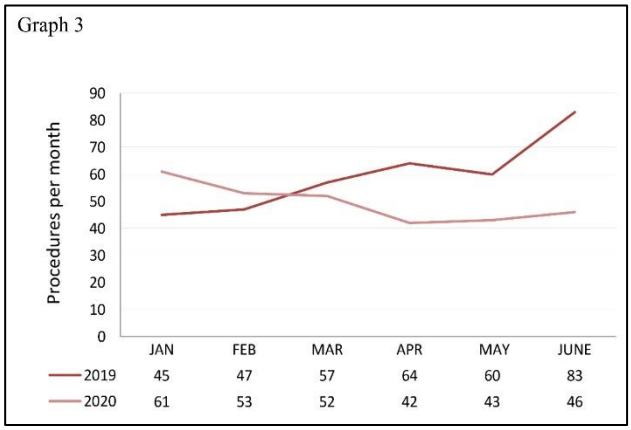

Figure 3: Number of urological procedures performed at the small surgery outpatient clinic from January to June 2019 and 2020.

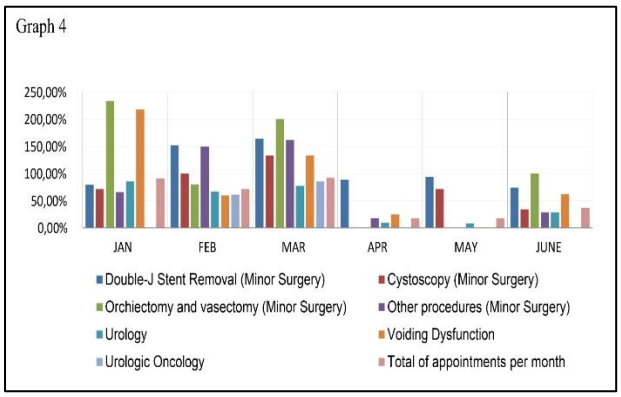

Figure 4: Comparative analysis as a percentage of the number of outpatient consultations of the HGF urology service from January to June 2020 in relation to the year 2019. Peq. cir. = minor surgery.

In the small surgery outpatient clinic of the HGF urology service, a gradual decrease in the volume of visits was observed from March 2020 (Figure 3), which continued to June 2020, adding up to a drop in the semiannual average from 356 to 297. Monthly reductions from March to June during these two consecutive years were −8.77%, −34.38%, −28.33%, and −44.58%, respectively. Thus, in the six months of 2020 analyzed, we obtained a reduction of −16.57% in the total number of visits to the small surgery outpatient clinic.

Data from visits to the urology outpatient clinics were also analyzed, dividing them by procedures performed and visits in subspecialties when relevant to the HGF urology service from January to June 2019 and 2020

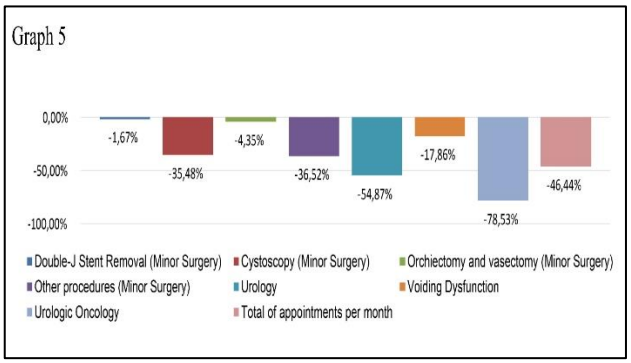

Figure 5: Variation in the number of outpatient consultations at the HGF urology service in the first semester of 2020 compared to the first semester of 2019 (in %). Peq. cir. = minor surgery.

In this analysis, a reduction in the number of urological consultations was observed, from consultations related to voiding dysfunction and oncological disorders to procedures such as double J removal, cystoscopy, orchiectomy, and vasectomy in the small surgery outpatient clinic (Tables 1 and 2 and Figure 4). However, the reduction was already verified in January 2020, with a total of 445 outpatient visits compared to 491 in the same period in the previous year (Tables 1 and 2), corresponding to 90.63% of consultations (Figure 4). This drop in the number of consultations in 2019 compared to 2020 reached its lowest level in April and May 2020, when it reached the monthly averages of 14 and 12 visits, respectively (Table 2). The most significant drop was observed in the months of April, May, and June 2020, culminating in a total of 375 outpatient visits in front of the 1,557 visits in the corresponding months in the previous year, indicating a reduction of 75.91% (Table 2). When analyzing the service provided throughout the first semester, we found a drop of 46.44% (Figure 5).

When comparing the averages of outpatient care, minor surgery, and elective and emergency surgeries in the first quarter of 2020 with the averages of the first half of 2019, we observed modest attenuations, ranging from −6.74% to −28% and even a considerable increase of 30.05% in the number of elective surgeries (Table 3). However, we obtained more pronounced falls in the analysis of the second quarter of 2020 with the first semester of 2019 with reductions of −23.2% in the performance of emergency surgical procedures, reaching up to a −82.51% decrease in elective surgeries. A similar picture was obtained in the comparison of the second and first quarters of 2020, with reductions from −21.08% to −86.55% (Table 3).

DISCUSSION

The COVID-19 pandemic was accompanied by notable changes in the most diverse health services and in social

life worldwide. The evolution of the disease in the state of Ceará began on March 15, 2020, with the disclosure of the appearance of the first three cases and, subsequently, with the beginning of quarantine on March 20, with the prohibition of the operation of products and services companies deemed nonessential by the state government. At the beginning of May, stricter isolation was declared with the lockdown of the Fortaleza capital.[9-12]

Although urologists are less involved in the direct treatment of patients with COVID-19, the pandemic significantly affected the urological services in tertiary hospitals, because of the saturation of health services in this period, as well as the reallocation of hospital resources.[13]

It was based on this situation and its association with the great modifying parameter observed since March 2020, the COVID-19 pandemic, that it was possible to analyze the data collected at the HGF urology service for this retrospective descriptive study, in which we saw a distinct change in the pattern of urological care from 2019 to 2020.

First, we observed a decrease in outpatient care in the second quarter of 2020 compared to data from the first quarter of the same year, with a decrease of 70.52%. This pattern was also observed with elective surgical procedures, with a reduction from 238 surgeries in the months from January to March 2020, the quarter before the beginning of the COVID-19 pandemic in Brazil, to only 32 procedures in the following three months, indicating a decrease of 86.55%. This finding was also noted in minor surgeries, with a 21.08% decrease in visits between the two quarters.

When evaluating the procedures performed at the emergency surgical center, a decrease of 28% and 23% in the first and second quarters, respectively, from 2019 to 2020 was identified. Minor surgery was also affected by the COVID-19 pandemic, with a decrease of 26.4% in the second quarter, a considerable drop compared to that observed in the first quarter (6.74%).

The importance of the findings described in this work is observed when considering the consequences of attenuating the volume of surgeries and urological care. Among the various impacts on the urological services provided, the significant losses of the population can be presumed and described, especially in patients with acute conditions and in need of rapid and diligent intervention, such as renal and ureteral lithiasis, as well as patients with manifestations of acute renal dysfunction due to diseases that can be resolved by a surgical approach and cannot rule out the high prevalence of neoplasms of the urological system in the general population. These latter diseases correspond to a large part of patients who seek care in a urology service of a tertiary hospital such as the HGF, causing significant impacts on the diagnosis and prognosis of cancer patients, as well as on the quality of life, possibility of treatment, and clinical follow-up of such patients.[14-19]

Thus, without the analysis of new variables in a complementary longitudinal study addressing the impact of the pandemic in urology services, it is difficult to assess the real consequences of the COVID-19 pandemic. Among them, the postponement of outpatient follow-up consultations for cancer patients and the reduction in the performance of diagnostic procedures for neoplasms may have a significant impact on their prognosis, complications, morbidity, and mortality rates.

Generally, in the quantitative study of the descriptive type, the chosen design does not allow the data to be used for hypothesis testing, since the objective is only to describe the fact itself, although hypotheses can be formulated later. However, the direct impact of the COVID-19 pandemic is visible with the reductions observed in the flow of outpatient consultations and surgical procedures in the HGF urology department during this period.[9,10]

Thus, despite the apprehension of the spread of SARS-COV-2 having its support justified by its importance in its current context, we question whether maintaining these urological patients without outpatient follow-up or with care adjusted to pandemic conditions would really be a safe option. Furthermore, the increase in emergency cases or complications resulting from clinical therapeutic failures or due to the difficulty or delay in accessing health services can be significant and may have a negative impact on the morbidity and mortality of various urological disorders with the potential for resolution or clinical or surgical management.[20]

The major limitation of our study was the retrospective analysis and yours inherent problems. Another potencial limitation was the imprecision data collection by those responsible for CPSHQ.

CONCLUSION

The hypothetical relationship in this descriptive study between the reduction in the volume of urological services in a tertiary hospital can be observed objectively by analyzing the data obtained through the CPSHQ of the HGF, revealing the direct impact on the urological services of the same hospital in the peak months of the COVID-19 pandemic in Brazil, corresponding mainly to the second quarter of 2020. Surgeries, minor procedures, and elective care were directly affected by the various services of the hospital in question, and they were not different from those related to the specialty in question. Losses to the population in postponing the treatments of some pathologies, mainly oncological and urinary lithiasis, which are HGF reference services, will be observed throughout the subsequent months of the pandemic, reflecting on probable negative impacts for these patients. New future studies will show us the results resulting from

the interruption of the various services affected by the COVID-19 pandemic.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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