

RESEARCH ARTICLE

Increased Number of Major Amputations During Pandemic Could Be Caused by Patients Fear of Sars-Cov-2

Josip Figl^{1*}, Damir Haluzan^{1,2}, Ivan Brizic¹, Predrag Pavic^{1,2}, Tomislav Mestrovic^{1,2}, Suzana Figl¹

Figl J, Haluzan D, Brizic I, et al. Increased Number of Major Amputations During Pandemic Could Be Caused by Patients Fear of Sars-Cov-2. *Int J Endovasc Treat Innov Tech.* 2020;1(1):13-15.

Abstract

Objective: SARS-CoV-2 pandemic and fear of getting infected with the virus decreases the number of outpatient examinations and delays medical treatment in patients with possibility of amputation.

Methods: A retrospective data analysis in a single institution for two period of times, during SARS-CoV-2 pandemic compared to one year before.

Results: The data revealed a significant decrease in number of outpatient examinations for 33% and increase of major amputations for 29% during four months of most difficult SARS-CoV-2 pandemic time in Croatia. **Conclusion:** The patients fear of SARS-CoV-2 virus infection and delayed time of seeking medical assistance might be the explanation for increase of major amputations. Patients with limb threatening conditions fall into group of medical emergencies and should seek medical assistance and this should be clearly communicated through the media.

Key Words: *Major amputation; Pandemic; COVID-19; SARS-CoV-2; Fear*

Introduction

SARS-CoV-2 pandemic has a great economic, social, and medical impact on human lives in many ways. General medical condition, psychological state and patient way of thinking have changed. The fear of virus-spreading and getting infected overcame the patient's usual behavior in treating their acute surgical problems. One of best examples is increased number of major amputations during the SARS-CoV-2 pandemic. Major amputation includes below the knee (BTK) amputation, above the knee (ATK) amputation and hip disarticulations (HD). Major amputations in many cases can be avoided in two occasions. Possible revascularization should be done as soon as possible, and minor amputations should be performed on time to stop the progression of the disease. These options require that patients come to the doctor on time. Treatment delay usually leads to inevitable gangrene progression and consequent major amputation [1].

Materials and Methods

A retrospective analysis in a single tertiary health center was performed for two period of times. The observed periods were between February 1st and May 31st of 2020 and between February 1st and May 31st of 2019. The number of examinations in emergency surgical service and the number of outpatients follow up examinations in vascular and general surgery were compared between observed periods. Values of leucocyte count and C reactive protein (CRP) on admittance in patients with major amputation was compared between observed periods. The goal of this analysis was to determinate weather there was any difference in number of surgical outpatient follow up examinations and the number of major amputations during a four-month period of SARS-CoV-2 pandemic compared with pre-SARS-CoV-2 time. Values of leucocytes and CRP were used as an indicator of time of amputation. Descriptive statistics and statistical

¹Department of surgery, University Hospital Centre Zagreb, Kispaticeva 12, Zagreb, Croatia, Europe

²School of Medicine, University of Zagreb, Salata 3, Zagreb, Croatia, Europe

*Corresponding author: Josip Figl, MD, Department of surgery, University Hospital Centre Zagreb, Kispaticeva 12, 10000 Zagreb, Croatia, Europe, Tel: +385 1 2388240; E-mail: figlmd@gmail.com

Received: July 24, 2020, Accepted: September 14, 2020, Published: September 30, 2020



This open-access article is distributed under the terms of the Creative Commons Attribution Non-Commercial License (CC BY-NC) (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits reuse, distribution and reproduction of the article, provided that the original work is properly cited and the reuse is restricted to noncommercial purposes.

analysis were done in Microsoft R Open 3.5 (64-bit), based on the version of R 3.5.3 [2].

Results

In observed period in year 2019, there were 1803 vascular and 1496 general surgical outpatient examinations and 4270 emergent surgical examinations, which counts jointly 7569 outpatient examinations. In year 2020 in the same period, there was a significant decrease in number of outpatient check-ups to 765 vascular, 694 general surgical and 3635 emergent surgical examinations which jointly counts 5094 examinations (Table 1). Decrease in total number of examinations in 2020 in relation to 2019 was 33%.

TABLE 1
Number of outpatient examinations

| Year | 2019 | 2020 |
|------------------------|------|------|
| Vascular surgery (No) | 1803 | 765 |
| General surgery (No) | 1496 | 694 |
| Emergency surgery (No) | 4270 | 3635 |
| Total (No) | 7569 | 5094 |
| Decrease (%) | | 33% |

In observed period in year 2019 there were seven BTK, 27 ATK amputations and one HD. In the same period in year 2020 there were 13 BTK, 32 ATK amputations and no disarticulations (Table 2). Increase in total number of amputations in the same period of 2020 was 29%. Patient demographic characteristics and risk factors are presented in Table 3.

TABLE 2
Number of major amputations

| | 2019 | 2020 |
|--------------|------|------|
| BTK | 7 | 13 |
| ATK | 27 | 32 |
| HD | 1 | 0 |
| Total | 35 | 45 |
| Increase (%) | | 29 |

TABLE 3
Demographic characteristics and risk factors for patient with major amputations

| | 2019 | 2020 |
|-------------------------|-------|-------|
| Number | 35 | 45 |
| Male (%) | 54.3 | 53.3 |
| Female (%) | 45.7 | 46.6 |
| Age (Avg) | 74.11 | 74.13 |
| Hypertension (%) | 91.4 | 88.8 |
| Diabetes (%) | 80 | 80 |
| Renal insufficiency (%) | 31.4 | 31.1 |
| Coronary disease (%) | 34.2 | 35.6 |
| Smoking (%) | 74.2 | 73.3 |

Data sample for L and CRP was tested for normality of distribution by Shapiro-Wilk, and for both variables it was shown that the distribution of these variables significantly deviates from normal ($p < 0.05$), so the distributions are described by median, minimum, maximum and quartiles respectively. Significance of the differences in the variables L and CRP were tested by a nonparametric Mann-Whitney U test. Median value of L was 14 in 2019 (minimum 7.2, maximum 33.5), and in 2020 15.1 (minimum 6.4, maximum 32.0). Median CRP value in 2019 was 162 (minimum 5 and maximum 368), and in 2020 was 84 (minimum 3 and maximum 425).

Despite the differences in the medians, given the large dispersion of values (Figure 1 and Figure 2), the difference was neither significant for L nor for CRP with $p=0.317$ and $p=0.14$ respectively (Table 4 and Table 5).

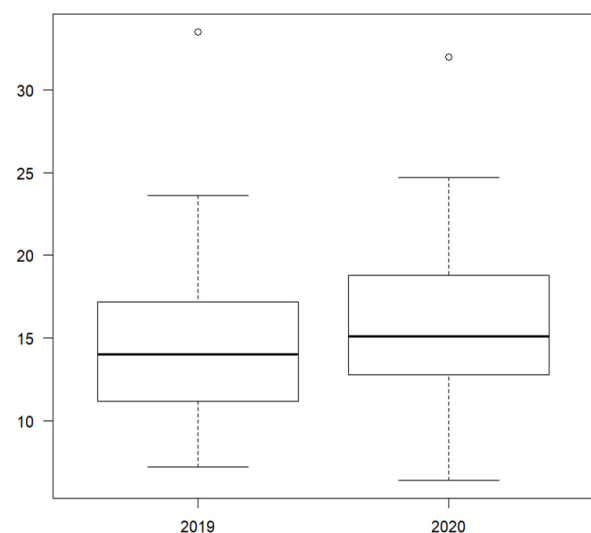


Figure 1) Distribution of L values.

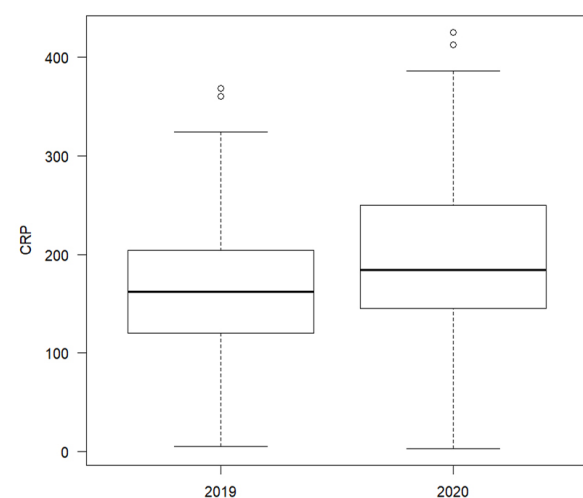


Figure 2) Distribution of CRP values.

TABLE 4
Leucocyte count

| Year | Minimum | 25% | Median | 75% | Maximum | p-value |
|------|---------|--------|--------|------|---------|---------|
| 2019 | 7.2 | 11.325 | 14 | 17.2 | 33.5 | 0.317 |
| 2020 | 6.4 | 12.8 | 15.1 | 18.8 | 32 | |

TABLE 5
CRP value

| Year | Minimum | 25% | Median | 75% | Maximum | p-value |
|------|---------|--------|--------|-----|---------|---------|
| 2019 | 5 | 120.25 | 162 | 203 | 368 | 0.14 |
| 2020 | 3 | 145 | 184 | 250 | 425 | |

Discussion

Every surgeon schedule patient follow up examinations according to best medical praxis, experience and in the interest of the patient wellbeing. This applies both for time of pandemic and for times without it. In the SARS-CoV-2 pandemic era, lots of countries introduced quarantines with Governmental worldwide suggestions for all the population to stay at home and not to go outside, unless there was an emergency [3]. All these measures referred especially to the endangered population-elderly people with chronic diseases. Patients in whom there is a possibility of amputation precisely belong to this vulnerable group of population. Majority of people obeyed those recommendations until the last possible moment before they went to the doctors. If we rule out the possibility that doctors intentionally delayed or cancelled scheduled because possible endangerment of patients, than the patients' fear of SARS-CoV-2 pandemic logically seems to have outweighed their need for regular check-ups in the outpatient clinic or emergency department which would normally take place in pre-SARS-CoV-2 time [4]. In circumstances like this pandemic, the great amount of fear leads patients to think it is better to get an amputation than to be infected with the SARS-CoV-2 virus, because this infection probably equals death. In order to survive, patients then choose the "less worse" option. This thesis could explain why the patients were waiting until the last possible moment to make a decision when choosing between going to hospital for help and the fear of possible getting virus infection at the hospital or on the way to the doctor's

during pandemic. This data jointly shows that, during four months of most advanced SARS-CoV-2 pandemic in Croatia and Governmental measures taken to prevent its spreading, there was a 33% decrease in number of outpatient examinations and a 29% increase of major amputations. We observed differences in the medians of L and CRP, but due to the large variability, the difference was not significant. Surely a larger sample and longer follow-up is needed for further research. Local limb status that has an impact on the decision to amputate was not analyzed. Given the relatively small number of patients in the group, it was not possible to analyze the data specifically for patients with diabetes, peripheral arterial disease, and a combination of both conditions.

Conclusion

Percentage data clearly revealed a significant decrease in number of surgical outpatient examination and increase of major amputations in SARS-CoV-2 pandemic period compared to the same period in the previous year. Differences in the medians of L and CRP were observed but the difference was not significant. Although this data cannot be interpreted from only one point of view, decreased number of surgical outpatients follow up examinations and delayed time of seeking medical assistance, due to fear of SARS-CoV-2 virus infection led to increase of major amputations. Patients with limb threatening conditions fall into group of medical emergencies and should seek medical assistance despite fear of SARS-CoV-2 infection. Such information should be clearly communicated through the media to endangered population.

References

1. White JV. Lower Extremity Arterial Disease. In: Cronenwett JL, Johnston KW, editors. Rutherford's Vascular Surgery. (17thedn). Saunders, Elsevier, Philadelphia. 2010;pp.1575-93.
2. R Core Team. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. 2019.
3. <https://civilna-zastita.gov.hr/vijesti/priopcenje-zamedije-stozera-civilne-zastite-republike-hrvatske-od-26-ozujka-u-9-30-sati/sve-odluke-stozera-civilne-zastite-rh-za-sprecavanje-sirenja-zaraze-koronavirusom/2302>
4. How to alleviate your fears of routine medical check-ups and errands during Covid-19. 2020.