

The Effect of Quarantine Due to COVID-19 Pandemic in Surgically Treated Fractures in Greece: a Two-Center Study

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ABSTRACT

Objectives: Many countries have implemented quarantines to control the Coronavirus (COVID-19) pandemic spread. The quarantine effects on surgically-treated fractures, operated during this period (March 9th – May 4th) in two public Greek institutions, the “Venizeleion” General Hospital of Crete (VGH) and the “251” Hellenic Air Force General Hospital of Athens (“251” HAFGH) were evaluated and compared with those of the same period of 2019.

Materials and methods: This is a retrospective study of a prospectively collected database. Evaluated data included gender, age, and trauma mechanism.

Outcomes: A total of 103 patients who had suffered fractures were surgically treated in both institutions during the quarantine period of 2020 compared to 179 during the same period of 2019, showing a reduction of 43% in surgical cases. The mean age of patients treated in 2020 was 72.2 (SD=19.9), as compared to 65.3 (SD=21.5; *p*-value=0.008) in 2019. There were 70 (68%) elderly patients (>65 years) in 2020 and 103 (57.6%) in 2019. Of all treated fractures, 31% were caused by high energy mechanisms during the explored period of 2020, as compared to 45% in 2019 (*p*-value=0.019).

Conclusions: This is the first study in Europe evaluating the effect of COVID-19 quarantine on surgically treated fractures. The findings showed a significant decline in surgically treated fractures, particularly high-energy fractures, along with a significantly higher mean age of patients in 2020 compared to 2019. Low-energy fractures in elderly during quarantine emphasizes the need of prevention measures to minimize their incidence, especially in a time when the health personnel and resources are engaged in the battle against COVID-19.

Keywords: COVID-19, pandemic, fractures, Coronavirus, trauma, fracture prevention, quarantine, lockdown.

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INTRODUCTION

Coronavirus disease (COVID-19) was identified in December 2019 as the cause of a cluster of unexplained pneumonia cases in Wuhan, China (1). It rapidly progressed into a global pandemic, and the World Health Organization (WHO) characterized the disease as “a public emergency of international concern” on January 30th 2020 (1). At the time of writing, COVID-19 has affected over nine million patients and has caused over 470,000 deaths worldwide (2).

Constraining the spread of COVID-19 has mainly relied on quarantines and behavioral interventions, due to lack of effective treatment so far (1, 3). In Greece, such firm measures have been implemented quickly in order to control the spread of this highly transmitted virus. The main concern has been the endurance of the aged national health system under the pressure of a country-level epidemics (4). In Greece, on March 9th 2020 schools were closed and social distancing became mandatory, while strict hygiene measures were strongly advised. Since COVID-19 cases were increasing on March 23rd, general lockdown was implemented. As of March 11th, hospital operating theaters were dealing only with emergency cases, which meant that only fractures would be operated during quarantine in nationwide orthopaedic departments. As of May 4th, lockdown loosening was announced and elective cases could receive surgical treatment.

The present study aimed to evaluate the effect of nationwide quarantine due to COVID-19 on surgically treated fractures by recording all fractures requiring operation during the quarantine period in Greece (March 9th – May 4th) in two public institutions, the “Venizeleion” General Hospital of Heraklion, Crete, Greece (VGH), and the “251” Hellenic Air Force General Hospital of Athens, Greece (“251” HAFGH), while comparing them with those of the same period of the previous year. □

MATERIALS AND METHODS

This is a retrospective study of a prospectively maintained database. Data on surgically treated fractures were collected from VGH and “251” HAFGH during the quarantine period

(March 9th- May 4th) of 2020 and they were compared to those recorded in the same period of 2019.

The trauma mechanism was evaluated from patients’ records and fractures were classified as low- or high-energy, with low-energy fractures being defined as a result of falling from standing height or less, while high-energy was defined as any other type of trauma (5). Characteristics of patients undergoing fracture surgery, including age (elderly >65 years and non-elderly <65), gender, and type of fracture, have been also recorded.

The VGH is a 600-bed secondary hospital on the island of Crete, Greece. It represents one of the two big reference hospitals of the whole island, serving a population of approximately 650,000, who is mostly rural and to a lesser extend urban and suburban.

The “251” HAFGH is a 500-bed secondary hospital in the city of Athens, the capital of Greece, serving mainly urban and suburban population (military personnel, veterans and citizens; approximately 500,000).

The present study has received the bioethics committee approval in both hospitals. □

OUTCOMES

A total of 103 patients suffering a fracture were surgically treated in both institutions during the 2020 quarantine period, as compared to 179 during the same period of 2019, revealing a 43% decline. The mean age of patients operated in 2020 was 72.2 [standard deviation (SD) 19.9], as compared to 65.3 (SD=21.5) of those in 2019 (p-value=0.008). A total of 70 patients (68%) were elderly (over 65) in 2020 as compared to 103 (57.6%) in 2019.

Regarding fracture types, in 2020 there were 66 (64%) hip fractures, eight (8%) ankle, seven (7%) each hand, femur and tibia, three (3%) elbow and forearm fractures and one (1%) patella and foot fracture, respectively. In the same period of 2019, there were 85 (47%) hip fractures, 23 (13%) tibia, 21 (12%) ankle, 12 (7%) forearm, 11 (6%) hand, 10 (5.5%) femur, six (3%) foot, five (2.8%) elbow, four (2.2%) humerus shaft and two (1%) patella fractures.

Of all fractures, 31% were characterized as high-energy fractures during the quarantine period of 2020, as compared to 45% during the same period of 2019 (p-value=0.019). □

DISCUSSION AND CONCLUSIONS

COVID-19 was declared a pandemic on the 11th of March 2020 by WHO. Due to lack of effective treatment and vaccine, many countries have implemented a plethora of strict control measures to limit the flow of people, including traffic control lockdowns, self-isolation at home and strictly limited access to community services (1, 4).

The present research is the first study originating in Europe that evaluates the effect of quarantine due to COVID-19 pandemic on surgically treated fractures in Greece, by gathering data from two secondary public hospitals. The main findings showed that, during the 2020 quarantine period, the number of patients requiring fracture surgery decreased by 43% when compared to the same period of the previous year. Furthermore, the percentage of high-energy fractures was significantly lower and the mean age of studied patients significantly higher during quarantine than the same period of 2019.

High-energy fractures are most commonly associated with traffic as well as work accidents (5, 6). Due to lockdown, tele-working was implemented in many cases, while numerous businesses were temporarily closed. Therefore, work accidents were minimized. Additionally, very few cars were allowed in the streets following strict rules. Hence, there was a decline in traffic accidents.

It is of note that the mean age of patients undergoing surgical treatment for fractures and the percentage of low-energy fractures during quarantine was significantly higher when compared to the same period of 2019. Social distancing and staying at home lead to a decline in the number of fractures. However, it is known that elderly people suffer in-house falls, which easily lead to

low-energy fractures due to osteoporosis (5, 7). These traumas were not avoided during the lockdown period. During the current global pandemic of COVID-19, fracture characteristics are of utmost importance, especially among the elderly, who have a higher morbidity and mortality than the general population.

Therefore, targeted preventive measures should be implemented for the elderly, who stay at home. These measures could be relatively simple, such as keeping adequate light and dry ground in the living room (especially at night) and bathroom as well as wearing comfortable clothes on a daily basis. When taking a shower, the elderly should have a seated position rather than a standing one. They could also benefit from weekly monitoring by a primary health care tele-system. Additionally, medication for people in this age group should be stocked in lockdown periods.

The present study has some limitations, including its retrospective design and the fact that it is based on data from only two centers. Nevertheless, it represents the first effort originating in Europe to report the effect of quarantine due to COVID-19 on surgically treated fractures.

In conclusion, the present study revealed the disproportional prevalence of low-energy fractures, with those of the hip being the most common, during the quarantine period. It is of paramount importance to implement prevention measures to minimize these fractures, especially during the COVID-19 pandemic, since hospital resources and personnel may have shifted towards the demanding care of COVID-19 patients. □

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