
ORIGINAL ARTICLE

The impact of COVID 19 pandemic on emergency traumatology service: experience from an Italian red zone

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ABSTRACT

BACKGROUND: The aim of this study was to analyze the accesses to the ER at Department of Orthopedic and Traumatology Unit of Ferrara (Emilia-Romagna, Italy) during the “phase 1” of the pandemic compared to the same period in 2019.

METHODS: All patients managed in the orthopedic ER of Sant’Anna University Hospital (Ferrara, Italy) from March 8th to May 4th 2019 and 2020 were included in this retrospective study.

RESULTS: Our analysis shows an overall reduction in emergency room access but not a reduction in hospitalizations and femur fractures and a change in the reason for admission and the subsequent demographics of patients admitted.

CONCLUSIONS: The results also highlighted the inappropriate use of emergency rooms in the non-COVID period.

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KEY WORDS: Emergency service, hospital; COVID 19; Traumatology; Femoral fractures; Orthopedics.

The COVID-19 pandemic, caused by Sars-Cov-2, originated in Wuhan (China) in the last week of December 2019.¹ First cases in Italy were confirmed on 31 January 2020, when two Chinese tourists in Rome tested positive for the virus.² The rise of cases was fast and exponential and by the beginning of March, the virus had spread to all regions of Italy. On 8 March 2020, Italian government imposed a national quarantine renamed “phase 1.” Main restrictions imposed were constraint of free movement except for necessity, work and health circumstances, suspension of teaching in schools and universities, closure of commercial and retail businesses except

essential goods sellers and sports activities were banned.³ The lockdown measures implemented by Italy was considered the most radical after the measures implemented in China.⁴ The Director General of the World Health Organization, Tedros Adhanom Ghebreyesus praised Italy’s decision to implement the lockdown. Health services were obligated to adopt immediate changes for every kind of hospital activity. Elective surgeries and first non-urgent visits were stopped.⁵ A new government decree comes into force since 4 May 2020, reducing the strict lockdown rules that had been in place nationwide and ending phase 1. In literature different reports described the hospital

reorganization and management of orthopedic patients during the COVID-19 pandemic⁶ but a study showing the impact of the virus on access to the orthopedic emergency room (ER) is not available. The aim of this study is to analyze the accesses to the ER at Department of Orthopedic and Traumatology Unit of Ferrara (Emilia-Romagna, Italy) during the “phase 1” of the pandemic compared to the same period in 2019.

Materials and methods

All patients managed in the orthopaedical ER of Sant’Anna University Hospital (Ferrara, Italy) from March 8th to May 4th 2019 and 2020 were included in this retrospective study. All information was obtained by means of data collection in the medical records of the orthopaedical ER. To ensure the accuracy of each of the cases we looked through the discharge letter sent to the general practitioner. We have analyzed the reason for admission and the subsequent demographics of patients admitted. Variables of interest included total number of accesses, number of accesses categorized into 6 age groups: 0 to 15 years, 16 to 30 years, 31 to 45 years, 46 to 60 years, 61 to 75 years and over 75 years, weekly access distribution, number of trauma at work and road traffic accidents, number of fractures, number of pain symptoms in the absence of traumas and number of urgent hospitalizations from the ER. The location of injury was classified into upper limb fractures, lower limb fractures and spinal bone fractures. Ethical approval was obtained from the Ethic Commission of the Medical Faculty of the University of Ferrara.

Statistical analysis

Shapiro-Wilk test was used to test for normality of distribution of the continuous variables. In the presence of symmetry of the distributions, the variables will be represented with mean and standard deviation or, in the case of non-normal distribution, with the median value and interquartile range. Categorical data were expressed as total numbers and percentages. Statistical comparisons of categorical variables were assessed using Pearson’s Chi square test or Fisher’s Exact test depending on the minimal expected count in each crosstab.

Results

During the period 8 March-4 May 2019, analysis of patient admissions showed that 1952 patients have been admitted at orthopedics ER. We observed 187 trauma at work and 86 road traffic accidents. The average age of these patients was 44,59 years, the median of age was 47 years and the interquartile range was 22-66. The higher rates admissions were for patients between the ages of 46 and 60 years (21.2%) while the lower for patients older than 75 years (14.5%). We diagnosed 461 fractures in 458 patients, 97 fractures were diagnosed in patients younger than 18 years and 364 fractures in patients aged 18 years and older. The percentage of patients visited with fractures was 23,46%. The most common fracture site was upper limb (250 cases, 54.2%), followed by the lower limbs (177 cases, 38.4%) and the spine (34 cases, 7.4%). We visited 408 patients due to atraumatic pain of whom 190 patients had low back pain, 126 patients had gonalgia, 38 patients had cervicalgia, 26 patients had coxalgia, 11 patients had dorsalgia and 17 patients had footache. Among 1952 patients visited, 68 patients have been hospitalized for urgent surgery. The most common causes of hospitalization were femur fractures (32 cases, 47.7%) with 19 femoral neck fractures, 12 perthrocanteric femur fractures and 1 femoral diaphysis fracture.

Differently, during the period 8 March-4 May 2020, 637 patients have been admitted at orthopaedics ER. A percentage reduction of 67,3% compared to the previous year was detected. Weekly trend of ER access in the two periods analyzed is summarized in Figure 1. We observed 56 trauma at work and 11 road traffic accidents (Figure 2). The decrease of road traffic and trauma at work cases are important but not statistically significant (P value <0.001 and 0.553 respectively). The average age of these patients was 53 years old, the median of age was 55 years and the interquartile range was 38-72. Also in this case the higher rates admission (Figure 3) were for patients between the ages of 46 and 60 years (24.48%) but the lower rate admission were for patients between the age of 16 and 30 years and 0 and 16 years (9.1% and 9.7%, respectively). We diagnosed 253 fractures in 249 patients (Figure 4). The percentage of patients

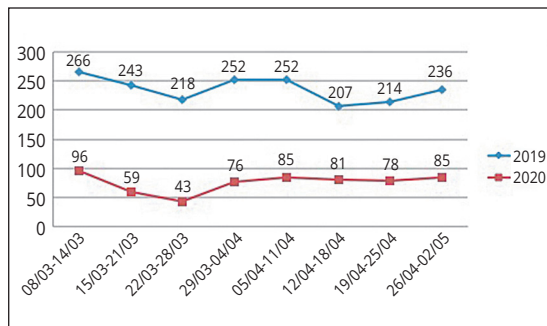


Figure 1.—Weekly distribution of the number of patient accesses to our orthopedic emergency room in the two period analyzed.

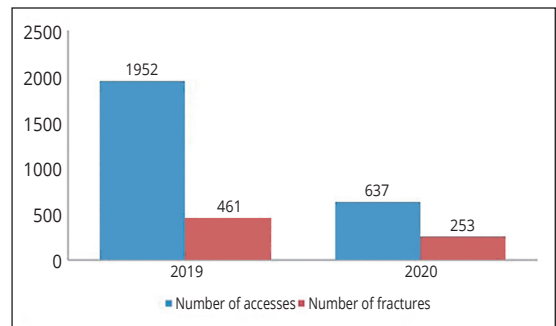


Figure 4.—Comparison between the number of accesses and the number of fractures of the two periods analyzed.

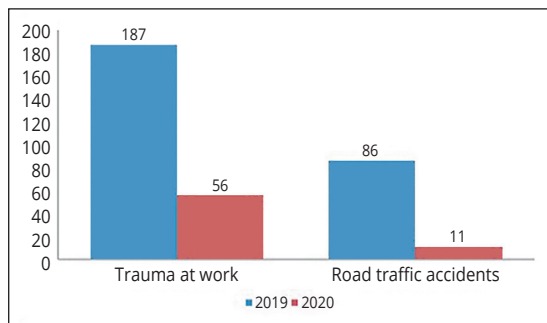


Figure 2.—Number of accesses at our orthopedic emergency room for trauma at work and road traffic accidents.

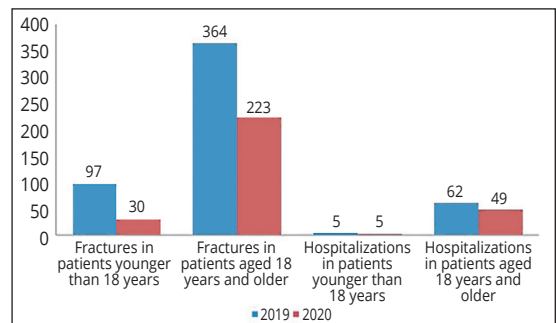


Figure 5.—Number of fractures and hospitalizations divided by age groups.

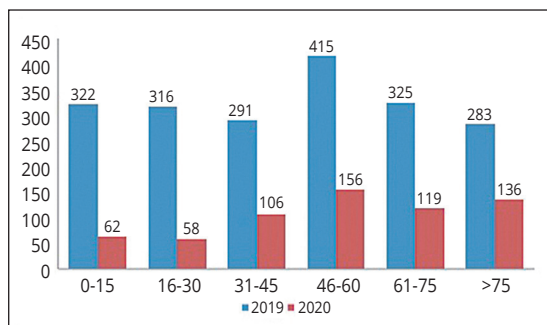


Figure 3.—Number of accesses divided by age groups in the two periods analyzed.

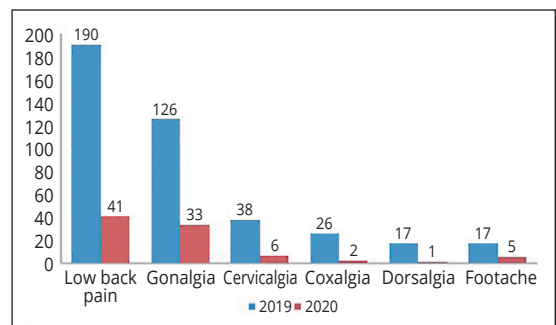


Figure 6.—Number of patients with atraumatic pain in the two periods analyzed.

visited with fractures was 39%. Thirty fractures were diagnosed in patients younger than 18 years and 223 fractures in patients aged 18 years and older (Figure 5). The most common fracture site was upper limb (139 cases, 54.9%), followed by the lower limbs (177 cases, 37.2%), and the spine (34 cases, 7.9%). Of the 637 patients visited in our orthopedic ER, 51 patients were hospitalized for urgent surgery. The most common cause of hospitalization were femur fractures

(27 cases, 52.9%) with 14 perthrocanteric femur fractures, 11 femoral neck fractures and 2 femoral diaphysis fractures. The differences in cases of fractures and hospitalizations between the two periods analyzed are statistically significant (P value <0.001). We visited 88 patients with atraumatic pain, 41 patients had low back pain, 33 patients had gonalgia, 6 patients had cervicalgia, 2 patients had coxalgia, 1 patient had dorsalgia and 5 patients had footache (Figure 6).

Discussion

The recent COVID-19 pandemic caused a significant reduction in hospital services in order to allocate maximum resources for the COVID-19 emergency.⁷ However, orthopedics and traumatology is a surgical branch with a high rate of emergencies with the consequent impossibility to create limitations in the access to the ER. Although no access restrictions were imposed at our orthopedic ER, many differences were observed between the two periods analyzed. Some of the variations observed are easily explained. For example, the reduced number of accesses caused by trauma at work and road traffic accidents is secondary to the restriction of outdoor, work and ludic activities. A part of the access reduction could also be related to the increasingly cited “questionable use of the ER”. In literature there are many papers that discuss multiple attempts to identify “nonurgent” or “inappropriate” ER visits and to develop strategies to triage them away from the ER.⁸ In the last decade, moreover, initiatives have been performed to limit access to ER and renewed focus on the critical role of the ER as a safety net provider. Data emerging from this article show that ER is used inappropriately in many cases. Most relevant data in support of this statement are the significant reduction in total ER accesses, reduction of patients referring pain symptoms in the absence of trauma and the increased percentage of patients visited for fractures compared to the previous year’s total (39% vs. 23.46%). In fact, despite the significant reduction of ER accesses, the same reduction was not observed for the hospitalized patients. Proximal femur fractures continued to engage our hospitals at the same pre-COVID volumes, while minor traumas drastically decreased. No significant differences were found on the most frequent type of fracture among hospitalized patients. We noted a percentage reduction of 78.5% of the access to ER for atraumatic pain or for patients suffering from low back pain. This data can have a double interpretation. The pandemic has highlighted the causes of access to the ER, showing that many of the routine visits can be managed in an outpatient clinic.⁹ On the other hand, it could be evidence that the etiological origin of low back pain

is work-related. A study shows that there is an association between back pain and heavy physical work, including lifting, bending and twisting, static work postures, including long-term sitting and psychosocial work factors such as work dissatisfaction.¹⁰ Another important difference observed during the lockdown period is the significant reduction in access for pediatric patients. This data conflicts with many studies in literature which report that the majority of pediatric trauma occurs at home.^{11, 12} It is understandable that the number of traumas among the children are lower than usual as a result of the closure of schools and sport activities. Another reason could be related to parents’ reluctance to refer to ER to avoid exposing themselves and their children to a COVID-19 risk hospital environment. A possible risk of this conduct is to manage late clinical conditions that would require rapid intervention. This is the first paper quantifying the impact of COVID-19 on the number and causes of accesses to an orthopedic ER.

Conclusions

The recent COVID-19 emergency highlighted the need for a reorganization of access to the orthopedic emergency room. It is essential to target the workforce to real emergencies and to reserve non-urgent visits for outpatient management. This would reduce waiting times and ensure better patient care. To achieve this, it is necessary to make patients aware of the clinical conditions that need to be managed in the ER and which ones in dedicated outpatient clinics and to cooperate with general practitioners who can perform an initial triage to avoid overcrowding of orthopedic first aid.

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Conflicts of interest.—The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

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