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The impact of COVID-19 on services and procedures in the field of Orthopaedics: a review article

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Abstract

Background

COVID-19 has affected not only the timely and effective care for orthopedic patients but also new directions and plans in the field of orthopedics. However, there is no evidence about how this pandemic or COVID-19 era will shift the care or will bring transition in the field of orthopedics medicine or surgery. Hence, the purpose of this review is to evaluate the effects COVID-19 on orthopedics surgery, the challenges facing experts in the field, and the new opportunities driven by the COVID-19 pandemic.

Material and Methods

Different articles gathered from databases such as Google Scholar and PubMed. This is a narrative review of full-text research articles published in the English language both in developed and developing countries with a specific focus on Orthopedics and COVID-19. The paper examined original research articles for information pertinent to the objective. It also reviewed all references of the eligible article to avoid missing any article relevant to the topic of interest.

Findings

The findings demonstrate that overall orthopedic surgeries and other services have been affected due to the COVID-19 pandemic. The frequency of different procedures has significantly declined across different countries and regions. Older adults are affected more than younger. However, the decline in the number of procedures for younger patients are affected. An integrative and collaborative team approach must be adopted by the orthopedic surgeons to address the anticipated increased patients'flow in the near future. In addition, telemedicine can be integrated into the field of orthopedics to provide remote care to the patients whenever required.

Conclusion

Since COVID-19 has suddenly disturbed most of the orthopedic procedures and activities in both the outpatient and the operating room, surgeons need to devise new strategies to overcome these challenges without compromising the patient's care.

Keywords: Orthopedics, COVID-19, Challenges, Future directions.

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1. Introduction

Since the end of 2019, the novel and deadly infection due to COVID-19 originated in one of the provinces of China followed by its spread throughout the remaining world [1, 2]. Ever since the first case of COVID-19 was detected in the Hubei district of China (Wuhan) at the end of November 2019, the virus started spreading to both developing and developed countries and regions [3], due to its highly contagious course [4, 5]. It was only within three months after the origin of the virus, the frequency of COVID-19 cases rose to a higher level even outside China, which resulted in reporting of new cases and related deaths to the World Health Organization (WHO) from multiple countries around the world. It was March 16, 2020, when the WHO announced this disease as a pandemic which had then numerous individuals and claimed several lives across the globe [6]. An interactive web-based dashboard managed by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University, Maryland, USA estimates the total number of cases to be 7,840,408, including 3,735,354 recoveries and 431,269 deaths as of June 14, 2020 [7].

The affected patients can transmit COVID-19 infection to other human beings through direct and indirect contact[8, 9]. Almost the whole world has experienced substantial morbidity and mortality as a result of the contagious nature of the virus and its associated complications [4, 5]. Furthermore, this unexpected and deadly pandemic has negatively affected the health status, life expectancy, and quality of life of a plethora of human beings on this planet[10]. The highly transmissible and infectious nature of the COVID-19 and its propensity to spread from one human being to the other forced countries to impose control and preventive measures. These include imposing countrywide curfews, lockdowns, physical or social distancing, and travel limitations throughout the world[11]. As a result, various health and non-health sectors have been affected economically and psychologically affected, eventually leading to a change in policies and plans of countries[12, 13]. Moreover, one of the modeling studies was conducted to draw projections for the percentage of non-emergency and elective surgeries that would be canceled or postponed for 190 countries during the COVID-19[14]. Its findings revealed that around 28 404 603 surgeries would be postponed during the peak 12 weeks of disturbance due to the COVID-19 pandemic, translated into 2 367 050 surgeries per week with the overall 12-week cancellation rate of 72·3% for 190 countries[14].

Like many other health departments or specialties within the field of medicine and surgery, COVID-19 has affected the field of orthopedics to a greater extent[15]. For instance, almost all of the countries postponed elective and non-urgent health care for a substantial amount of time[16]. This might have affected not only the timely and effective care for orthopedic patients but also have resulted in new directions and plans in the field of orthopedics [17]. However, there is no evidence about how this pandemic or COVID-19

era will shift the care or will bring transition in the field of orthopedic surgery. In addition, orthopedic surgeons might experience challenges in providing effective and required for their patients with an overall decline of care due to the outbreak. Moreover, it is also essential to reflect on the future directions and changes that need to be adopted by the health specialists working in the field of orthopedics.

2. Materials and Methods

Articles were searched from databases such as Google Scholar and PubMed. The author undertook controlled vocabulary and text-word searches in these two databases. Articles published in the field of orthopedics (surgery and medicine) and COVID-19 were included in this review. Searched articles were gathered using search terms such as 'Orthopedics, and COVID-19', 'Orthopedics medicine and COVID-19' 'Orthopedics surgery and COVID-19, 'field of Orthopedics and COVID-19' and 'Challenges in the field of Orthopedics and COVID-19'. Studies were limited to human studies reported in the English language, including studies conducted both in developing and developed countries. Primary and original articles pertinent to our objective were examined while conducting this review. Given the timing of pandemic from COVDI-19, the search is limited 2019 and 2020 and applied filter on the time period while searching the articles in the databases. Electronic databases were searched using a snowball sampling technique consisting of backward and forward reference searching of articles to identify the eligible articles. all references of the eligible article are reviewed to avoid missing any article germane to the topic of interest. After searching for different databases and following the above criteria, attention was on full-text articles of the studies that highlighted the challenges, opportunities, and future directions in the field of Orthopedics due to COVID-19.

3. Findings

The findings of this review are divided into two sections. The first section reviews the findings from the available studies regarding the cut down of the orthopedics surgeries across different countries. On the other hand, the second section reviews the future directions in the field of orthopedics in the light of COVID-19

Section 3.1. : The impact of COVID-19 on the orthopedics procedures

One study was conducted to investigate a decline in health care services provided in the field of orthopedics during the pandemic of COVID-19[15]. The authors of the study found that around 10 to 30% of the orthopedics experts responded that they would continue to perform the surgical procedures during the pandemic. However, it depends upon the nature of the surgery. In this survey, 6% of the orthopedic surgeons mentioned that they are still performing elective total joint arthroplasty at their centers[15]. However, this study revealed that postoperative follow-up and physical rehabilitation were drastically affected due to

COVID-19. Thus this study overall demonstrated that there was a remarkable decline in orthopedics healthcare services in Austria, Germany, and Switzerland; more specifically, there a substantial reduction in arthroscopic surgeries such as like rotator cuff repair or cruciate ligament reconstruction[15]. Moreover, the study also highlighted almost 100% decline in the elective total joint arthroplasty and 20% of the surgeons responded that orthopedics experts have stopped performing all orthopedics surgeries at their working stations[15].

Another study conducted by Thaler et al. evaluated possible interruptions in joint arthroplasty services throughout Europe[18]. The authors of this study conducted an online survey to inquire arthroplasty surgeons of the European Hip Society and the European Knee Associates about a decline in services related to total joint arthroplasty[18]. The study revealed that only 6% of the surgeons were able to provide elective services related to total joint arthroplasty, and 3.8% reported offering aseptic arthroplasty revisions at their respective workplaces[18]. The study participants also highlighted that 87.2%, 75.6%, and 25.8% reported doing procedures on periprosthetic fractures, septic arthroplasty revisions, and tumor arthroplasties, respectively. This study's results are consistent with the above online study conducted across three different countries, indicating a drastic cut down in the orthopedic surgeries and services in many centers[18].

Likewise, one more study was conducted in Italy to assess the effect of the COVID-19 crises on hip and knee arthroplasties in an orthopedic center[19]. The authors analyzed an institutional database to calculate or measure the frequency of hip and knee arthroplasties performed between February and April 2020[19]. More specifically, the study results revealed that the overall number of hip and knee arthroplasties plummeted by 76.5% during the era of COVID 2019 compared to the last year (2019). For example, the authors noticed that the mean number of hip and knee arthroplasties were performed per week was 101 in 2019 compared to 24 in 2020[19]. Moreover, the authors also mentioned that the death rate during this period was 1.2%, as opposed to 0% in 2019[19]. These findings illustrate that the COVID-19 pandemic had a considerable effect in Italy on the frequency of hip and knee arthroplasties that rapidly declined during COVID-19 crisis[19].

One study conducted in the USA explored the anxiety level of patients' suffering from hip and knee problems and needed hip and knee arthroplasties in the USA[20]. Since hip and knee arthroplasties in the USA are postponed, many patients suffered adverse physical and mental health outcomes because of postponing the surgeries. Six institutions conducted a survey in the USA on patients who had to undergo an elective hip and knee arthroplasty but that was canceled due to COVID-19[20]. The findings of the study revealed that most of the patients' orthopedics surgery was postponed by their respective surgeon in opposed to by patients them selfs. However, patients from regions, which were severely affected by the COVID-19

decided to cancel their own surger[20]. Moreover, older adult patients (18%) with a high likelihood of contracting COVID-19 were also more likely to cancel their surgeries on their own when compared to their younger counterparts (0%). But younger patients were more anxious about the unknown schedule for future surgeries due to concerns about job security and economic implications. As a result of delay in surgeries, around a quarter of the arthritis had persisted or worsened symptoms[20].

Section 3.2. : Future directions for the field of orthopedics in the light of COVID-19

Studies have indicated that orthopedics experts, both physicians and surgeons, should select patients wisely for surgeries and few points need to be considered before making any decision[21]. For example, not all patients are of the same age and needs, therefore, the overall age of arthroplasty patients needs to be considered, as patients requiring such procedures are often older with comorbidities, which might enhance their risk of complications and mortality if undergoing any procedure during COVID-19[21]. In addition, it might be possible that such patients might harbor the COVID-19 virus and might present with no apparent symptoms, therefore, it is highly crucial to take extra precautionary measures during this pandemic[21]. Furthermore, older patients might require rehabilitation services after surgery with more postoperative follow-ups when compared to younger patie[16]. Orthopedic surgeons must think twice before going ahead with such surgeries because rehabilitation services are usually not up to the mark or are sometimes entirely suspended in both in-patient and outpatient departments. Therefore, in most cases, it would be wise rather to postpone such type of surgeries for older patients to avoid unnecessary complications and mortality[16].

However, postponing such surgeries might increase the burden on orthopedic services as countries start shifting the lockdowns and curfew restrictions[22]. Therefore a multidisciplinary team of would be necessary to formulate a well-defined framework that guides the whole team to address the back lock of surgeries and provide necessary care to the deserved patients[23]. New and effective strategies need to be formulated for the near future to address the unfavorable effects that the outbreak will have on the waiting list of the patients[23].

Moreover, there are patients in this line that requiring semi-urgent procedures and unnecessary delaying surgeries for such patients can become problematic mainly for the older adult population[23]. In such circumstances, the orthopedic surgeons should make decisions after thorough and comprehensive assessment of a patient about with risks and benefits of the procedure balanced against the local condition related to the outbreak such as vulnerability to COVID-19 infection, availability of hospital resources, while following the optimum standards[23, 24].

In addition, since the older adults with associated comorbidities are at higher risk of hospital-acquired infection, surgeons might need to start conducting clinics with the younger and asymptomatic patients without recognized risk factors [23, 25]. However, telemedicine and digital health could be used efficiently to provide care to the older adults, which will not only provide them with care but will also prevent them from unnecessary risk relstedf to COVID-19[26, 27]. The symptoms of the older and fragile patients cane are explored remotely using online technologies. However, necessary steps can be taken to provide these older adults [26].

Moreover, given the nature of COVID19, social distancing will still be required in the upcoming months unless there is a final and determined solution to fight against the disease. Therefore, hospital administration must need to revisit the guidelines and mainly develop some plans for the waiting areas because these areas will require both hygiene as well as social distancing and hygiene[23]. These new plans might significantly reduce the waiting area's capacity, which will profoundly affect the flow of patients. Therefore, orthopedic teams need to devise new strategies because completely packed waiting areas will no longer be considered ideal due to the COVID-19 contagious nature[23]. Moreover, there need to be disinfection policies and guidelines with proper monitoring and evaluation to check whether such guidelines are implemented [23].

4. Conclusion

In conclusion, the findings of the review demonstrate that overall orthopedic surgeries and other services have been affected due to COVID-19 pandemic. The frequency of different procedures has significantly plummeted across different countries, which has affected patients' quality of life and overall wellbeing. Most commonly, older adults are affected more than younger; however, younger patients are also anxious to get treatment in order to avoid unnecessary financial implications due to fear of job loss. Since COVID-19 has suddenly disturbed most of the orthopedics procedures and activities both in the outpatient and the operating room, orthopedic surgeons need to devise some smart strategies to overcome these challenges without compromising the patient’s care. An integrative and collaborative team approach needs to be adopted by a multidisciplinary team to address the anticipated increased flow of the patients in the near future. In addition, implementing telemedicine in the field of orthopedics can provide remote care to the patients whenever required.

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