The Impact of COVID-19 on Future Orthopaedic Practice

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Abstract

No single event hitherto has stumped the world more significantly than the present Corona pandemic. In a short span of a few months, the world economy, healthcare, livelihood, and human survival have been direly threatened by the rapid increase in the number of COVID-19 cases and fatalities. While dispensations across the world are finding ways to tackle the pestilence, the medical fraternity faces a unique conundrum. On the one side, the health care team is at the forefront fighting the disease and saving patients from the grip of death. On the other side, the healthcare industry is facing a crisis in terms of safety of healthcare personnel, difficulties in online tele-healthcare, economic sustainability, challenges in healthcare education and other problems in safe health care delivery. The authors provide a broad perspective at the current pandemic and its implications on orthopaedic practice in the near future.

Keywords

- COVID-19
- pandemic
- orthopaedics
- surgery
- economics
- healthcare

Introduction

The global medical fraternity has been grappling to find ways to tackle the coronavirus pandemic. A miniscule virus (diameter of 125nm), belonging to the *Coronaviridae* sub-family, has afflicted more than 9,843,073 people across 188 countries and killed 495,760 people in a span of 4 months (as of June).¹ There is no medical cure or vaccine in sight, but we have been reasonably successful in mellowing down the contagious spread through time tested measures of quarantine, social distancing, wearing masks, and washing hands.

Nevertheless, these social distancing concepts have resulted in dramatic impacts in the working pattern of every other firm, organization, industry, and dispensations throughout the world. The healthcare industry is no exception to this, and has been both directly and indirectly affected by the pestilence. Being an infectious disease, the healthcare industry has been at the forefront of managing the illness and has been tremendously resourceful in treating patients, isolating contacts, formulating diagnostic and treatment guidelines, and researching for antiviral drugs and vaccines. Indirectly, akin to other industries, the healthcare system is also facing multiple safety issues such as enabling safe access to patients seeking elective and emergency medical care, safeguarding the interests of healthcare personnel, and providing timely and quality healthcare at an affordable price in the backdrop of its own dwindling economy.

Though elective healthcare has taken a backseat, orthopaedic surgeons cannot refrain from treating patients with emergency traumatic injuries. In particular, they seem to be more vulnerable to the infection due to a highly infective viral wind generated in the operating room by a combination of power surgical tools and ventilation systems. Hence, the current pandemic has thrown more challenges and questions in front of the medical fraternity than ever before. Rather than cowering in the time of adversity, this phase should be a time to introspect our future ways of delivering healthcare and formulating innovative measures of action.

Gloomy World Economy and Its Impact on Healthcare

The world economy has taken a hit and a severe post-coronavirus disease 2019 (COVID-19) recession is looming large on us. The International Monetary Fund has predicted that the global economy is projected to contract sharply by 3% this year, while the economy of behemoths like United States is expected to shrink this year by 5.9%, and China will grow at a measly 1.2%.² The robust economic growth witnessed in the last decade has been stymied by the untimely COVID-19 onslaught. The bug has not spared any of the major countries including China, United States, United Kingdom, and India that have been the big players in terms of product generation, provision and consumption,

and has dented all the key links of the economic supply chain. In the United States, the economy is expected to reduce by 25%, rendering many jobless. We are staring at an unforeseen economic future, and the revival of fiscal deficits seems to be a long-drawn affair. This has serious reflections on the economics of healthcare.

In the absence of a robust public healthcare system and a universal health insurance, a sudden medical emergency poses a serious threat to the already dried up coffers of patients from the low- and middle-income strata. Hence, from a patient's perspective, only dire emergencies and severe physical incapacitation may get precedence in seeking a medical consultation. In India, 62% of the total population rely on out-of-pocket expenses to manage healthcare bills. This is five to six times higher than in developed countries like United States and United Kingdom where it is 11 and 16% of the population, respectively.³ While a primary intervention itself would be a huge financial challenge, an untoward complication or a prolonged hospital stay would be a humongous problem. This places additional challenges to the treating physician in maximizing the functional outcomes and reducing the complications to the least.

Generally, economic recessions do not significantly impact the health industry since diseases and injuries continue to affect people during epidemics also forcing them to seek healthcare. However, in this COVID-19 recession, we are facing a unique situation since hospitals are one of the potential sources of infection desisting people to visit hospitals. A significant percentage of patients with non-COVID-19 illnesses has refrained from getting themselves treated, fearing the risk of contracting COVID-19. In a study performed across nine cardiac centers in United States, cardiologists have observed that ST elevated myocardial infarction cases are down by an estimated 38% and fear of contracting the COVID-19 in hospitals has been postulated as the prime reason for decreased attendance of such patients.⁴

Problems in Private Healthcare Delivery

The private health sector has significantly been impacted during the coronavirus pandemic and in a larger perspective, this has serious implications in countries like India where 72% hospitals and 60% of hospital beds are in the private health sector, the fourth-largest employer in the country. In general, the private healthcare industry works at measly profit margins. As per the US statistics, the net profit margin for healthcare services is 2.51%, while other industries like the hospitality industry and restaurant sectors work at 9.88 and 10.57%, respectively.⁵ Hence, the sudden reduction in the number of patient visits and surgeries has dented the smooth functioning of the financial sectors of private medical centers. Since the margins are measly, the plummeting profits have placed significant stress on the hospital managements. Unlike financial agencies and information technology firms or even educational institutions, which can sustain work based on "work from home" culture, hospitals cannot sustain this work mechanism on a larger scale. Doctors and support staff need to have a physical presence to run clinics, order

diagnostics, and perform procedures. The affliction of many frontline health workers and reduced attendance of patients fearing disease contraction had dealt a blow. Hence, sustenance of many hospitals is in a limbo leading to dramatic pay cuts, unprecedented layoffs, furloughs and "no work-no pay" diktats in many centers. In the United States, the unemployment rates are the second highest in the healthcare industry next only to the food and restaurant industry.

All Specialities Are Not Equally Affected

On a closer look, it appears that the coronavirus pandemic has not affected the healthcare system uniformly. On the surgical side, cosmetic surgeries, prophylactic surgeries, and surgeries for long-standing physical disabilities have taken a backseat, while obstetrics, trauma surgeries, and cancer surgeries continue to be performed at reasonable numbers.⁶ In the authors' tertiary referral orthopaedic center, the statistics indicate a whopping 76.3% fall in the total number of orthopaedic surgeries performed in the month of April this year (2020) as compared with last year (2019). Interestingly, while trauma surgeries faced only a 56% reduction, arthroplasty services and arthroscopy services witnessed a 98 and 92.4% reduction, respectively (► **Table 1**). It is expected that safety concerns in healthcare settings may pave the way for demands for minimizing duration of admission. Hence, day care surgical centers and minimally invasive surgeries that need abbreviated stay would become preferred in the future.

Safety of Elective Surgeries

Elective surgeries are considered unsafe for patients during the COVID-19 outbreak initially. Lei et al reported a series of 34 patients operated electively during the outbreak. Seven patients (20.6%) died of COVID-19-associated complications that indicated a higher case-fatality rate than in nonoperated COVID-19 patients. Fifteen patients (44%) were admitted to intensive care unit out of which 13 (86.6%) patients had level III surgeries (moderate complexity).⁷ However, strict protocols in place and division of health facilities into COVID-19 and non-COVID-19 treating would enable safe access for deserving patients to treatment facilities. Restivo et al have underscored the importance of presurgical screening for COVID-19 and allocation of specific COVID-19-free centers in a recent article. The authors have concluded that COVID-19-negative patients should proceed with the regular surgical

Table 1 Number of orthopaedic cases operated in the authors' center during the month of April in 2019 and 2020

	April 2019	April 2020	Percentage reduction
Total	1440	342	76.3
Trauma	904	295	45.9
Arthroplasty	175	4	98
Arthroscopy	118	9	92.4
Spine surgery	243	34	86

pathway in “COVID-19 free” centers, while patients who tested positive, albeit asymptomatic, should be home quarantined/dedicated facilities.⁸

In the authors' center, which is an exclusive center for orthopaedic diseases, only COVID-19-free patients were admitted for surgical intervention. During a 100-day period of the COVID-19 pandemic, 3,243 patients underwent surgery for various orthopaedic illness including elective surgeries for spinal degenerative diseases, osteoarthritis of knee and hip, and knee ligament reconstructions, and emergency trauma surgeries (► **Table 2**).

To safeguard the healthcare workers and patients, a standardized protocol was followed as below:

- Thorough history taking for contact, travel, fever, and respiratory symptoms;
- Temperature measurement;
- Throat swab for COVID-SARS virus;
- A dedicated isolated floor for admitted patients with unknown viral status;
- After COVID-19 status found negative, standard universal precautions abided in theater;
- Closed intubation chambers for all intubations, and
- Surgeons stayed outside operating room during intubation and extubation.

With this protocol in place, only three patients turned to be COVID-19 positive during preoperative evaluation and such electives were postponed. None of the emergency trauma patients were COVID-19 positive. We observed that there were no cross infections across patients and health personnel, and no mortality was documented directly attributable to COVID-19.

The Future of Clinical Practice

In general, seeking services from a medical professional revolves partly around availability of necessary expertise and partly influenced by physical proximity of healthcare facilities. With improvements in road, rail, and air connectivity, the importance of geography in choosing a healthcare provider had become blurred over the recent years, while the physician's expertise and the robustness of healthcare infrastructure have gained primacy. Patients travel across

the globe for medical treatment based on expertise, ease of care, economics, etc. However, with the imposing of travel restrictions due to COVID-19, people are seeking healthcare from institutions and physicians within their reach only. This is going to be the new norm in the upcoming near future. In the authors' center that covers a feeding zone of 200 km radius in Southern India, the travel restrictions imposed by the central and local state administration resulted in greater than 80% reduction in patients from neighboring districts and states. Big corporate hospitals, which rely on a larger scale of patients from other districts, states, and even other countries (medical tourism), have already found that it is going to be tough. In a major chain of hospitals based in India, the hospital received around 5,000 international patients per month and close to 1,000 domestic patients per month in the last financial year (2019–2020), while the number of international patients dropped to zero with the onset of COVID-19.⁹

Telemedicine—The Future?

Tele-conferencing provides an excellent opportunity in bridging several physical chasms imposed by the COVID-19 pandemic. It has enabled continuity of clinical care, communication with team members, and surgical education among peers and students. Weathering initial technical glitches and mental blocks among doctors and patients in embracing a new technology, telemedicine has now been popularly incorporated in many centers. This has been a boon for many patients as it helps direct one to one connection with their doctor. Apart from video consultation and sharing of radiological images, improvement in technology allows use of video services to show physiotherapy exercises, wound care, stoma care, and other physical demonstrations through telemedicine. Previous studies have shown the redundancy of frequent physical follow-up visits of patients to consult doctors in illnesses like shoulder cuff repair, spinal decompressions, and joint replacement surgeries,¹⁰ wherein telemedicine would come handy.

Ability to consult patients from distant locations, need for flexible scheduling of times, ability to obtain good rapport and high level of satisfaction from the patients, and reduced wait times for appointment are few advantages. In a study on pediatric medicine patients by Sultan et al,

Table 2 Different types of orthopaedic surgeries performed in authors' institution during a 100-day period (March to June 2020)

Elective surgeries		Emergency surgeries	
Spine (un-instrumented)	292	Upper limb fractures	517
Spine (instrumented)	288	Femur fracture fixation	300
Knee arthroplasty	189	Hip fractures	341
Hip arthroplasty	72	Tibia fracture fixation	294
Arthroscopy knee	153	Foot injuries	97
Arthroscopy (others)	45	Open fractures	270
Pediatric conditions	50	Pediatric trauma	60
Miscellaneous	75	Miscellaneous	200
Total	1,164	Total	2,079

Note: All cases were evaluated and treated through a standard protocol.

it was noted that parents did not have to take a half-a-day away from work and spend money on transportation to take children out of the school to doctor's office.¹¹ Out of a total of 189 virtual visits, the study reported that 80% of the consults were on mobile devices and the rest on tablets or other devices. However, telemedicine has its own limitations. The physicians should ensure proper documentation of the assessment and plan including follow-up care, in view of medico-legal concerns. The lack of physical touch and the presence of an artificial interface between the treating doctor and the patient is an emotional concern. While history can be elicited, the inability to assess the patients' gait, posture, attitude, and physical signs of orthopaedic diseases are critical limitations. While it is easy to follow up previously treated patients, evaluating and treating a new patient through telemedicine is a tight-rope walk.

The Parallel Pandemic of "Webinaritis"

Orthopaedic education has taken a new tangent with the arrival of coronavirus. While previously majority of our knowledge update happened through one of the multitudinous physical conferences and symposiums, the restrictions on travel and congregation of doctors, lack of a busy clinical schedule, and 24/7 availability of noted doyens of the world have opened a pandora of webinars and virtual meetings. Day in and out, doctors are bombarded with invitations to participate in one or another webinar either as a faculty or a participant ("webinaritis"). These webinars can bring together some of the biggest brains and experts from any part of the world to our doorsteps making orthopaedic education easier. The conglomeration of thousands of participants, which otherwise would be of immense scale and expenditure in a physical conference, makes these webinars a much-needed cost-effective option. On the negative side, the amount of excessive information, without a peer review and repetition of untested medical information, could make many of these meetings redundant.

Safety of the Surgical Team

Safety of healthcare personnel is facing an unforeseen threat in this pandemic time. The virus has a very high infectivity rate and stays in the air and fomites alive, for quite a significant time making hospitals one of the highest infectious zones. Especially medical specialists whose job involves close proximity with the patients' faces such as the dentists, otorhinolaryngologists, intensivists, infectious disease specialists, pulmonologists, and anesthesiologists seem to be facing the maximum brunt. As per the World Health Organization, 22,000 healthcare personnel belonging to 55 countries have been infected with COVID-19 and ~1,000 have lost their lives battling the deadly virus. The availability of personal protective equipment such as N-95 masks is a distant dream in many under-developed countries and poses a significant threat to the frontline workers. In a cross-sectional survey administered to 936 healthcare

professionals in Latin America, the access to protective equipment was as follows: gel hand sanitizer ($n = 889$; 95%), disposable gloves ($n = 853$; 91.1%), disposable gowns ($n = 630$; 67.3%), disposable surgical masks (785; 83.9%), N95 masks ($n = 516$; 56.1%), and facial protective shields ($n = 305$; 32.6%). The participants had expressed significant concerns about limited human resources support, physical integrity protection in the workplace, and support from public health authorities.¹²

Doctors Regaining a Lost Glory

"You can never appreciate the shade of a tree unless you sweat in the scorching sun." The negative attitude and spiraling animosity toward the doctors were at a peak before the COVID-19 hit the world. The COVID-19 pandemic has virtually unblinded the way the society viewed the doctors so far. There has been a paradigm shift in the manner the society treats the doctors and other healthcare workers. Medical professionals have been flummoxed by the sudden increase in respect and veneration exuded from the society. The social media and news columns are rife with news about doctors being celebrated, lighting lamps, and clapping to gesture their gratitude, and how several stores and firms across the world have offered special times and discounted products to frontline healthcare workers. This is the ideal time where health professionals can regain their lost glory and maintain their decorum by embracing highest standards of ethical practice and empathy to the fellow human being.

Conclusion

The COVID-19 pandemic has raised the bars of performance and attitude for the medical fraternity. A faltering economy, reduced availability of protective equipment, a minefield of infectious zones in hospital, and new trends in medical practice are enormous challenges in these testing times for us. The current testing times can be viewed as a "filtering time" that sieves out the tough organizations from the ordinary. Strong institutions developed on a robust bedrock of lean team, high efficiency, frugal expenditure, patient-centered and outcome-based approach, and that provide cost-effective healthcare are well-equipped to tide over the present situation. The crisis has enabled the medical fraternity to focus on opportunities for innovation in the delivery of healthcare, focusing on patient and healthcare personnel safety, cost-effectiveness, and remote delivery of healthcare services.

Conflict of Interest

None declared.

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