

COVID-19 disease, its challenge for Iranian vascular surgeons and our works

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Abstract

The onset of COVID-19 in Wuhan, China in 2019, December was a major catastrophe for everyone, especially the medical community. this disease affects vascular system and as a results vascular surgeons are involved in this pandemy by multiple and various patients specially dialysis patients by vascular access.in this article we are reviewing literature related to involving various medical specialist and their risk to infectivity by COVID-19 and reporting the condition of Iranian vascular surgeons at this pandemy.

Keywords: COVID-19, Surgeon, Iran

Introduction

The onset of COVID-19(corona) in Wuhan, China in 2019, December was a major catastrophe for everyone, especially the medical community. It gradually became a pandemic all over the world, so that by the time of writing this article, 222 countries are affected by this disease. More than 156 million people have been infected and more than 3.2 million have died. In Iran, more than 2.6 million people have been infected and 74.241 have died. Covid disease can range from asymptomatic to symptoms such as fever, cough, and malaise, and in some cases severe pneumonia and sometimes sever acute respiratory syndrome [1]. Laboratory finding including lymphopenia and neutrophilia and increased prothrombin and increased D-dimer are seen in these patients [2]. The risk of thrombotic complications has been expressed in repeated studies [3, 4]. About 90% of patients with pneumonia have hypercoagulability [5]. In 31% of cases, thrombotic complications have been observed in patients admitted to the ICU despite the use of anticoagulants [6]. Corona virus by angiotensin-converting enzyme-2 receptor effects on the type II alveolar cells [7, 8]. Also another study showed that the possible contributory mechanisms for the systemic changes found in such patients

include: 1. induction of pro coagulant factors, 2. the formation of pro-inflammatory cytokines, which are mediators of atherosclerosis, contributing directly to the rupture of the atherosclerotic plaque by local inflammation, and 3. hemodynamic changes that predispose to ischemia and thrombosis [9].

By this roads Covid Causes vascular diseases in these patients and highlights the role of vascular surgeon to diagnose and treat vascular problems. Sometimes this contact with patients is prolonged and the longer the contact is, the higher the probability of transmitting the disease [10]. The vascular surgeon should always be prepared to contact these patients while maintaining personal protection equipment (PPE) because there is no reason why a patient with emergency vascular problems should not have covid-19 disease or a patient with covid-19 disease should not have a vascular surgery emergency.

Also, due to the inherent nature of this field and having many cases of vascular emergency, it requires the permanent presence of a vascular surgeon in the hospital and operating room. Occasionally, in patients with asymptomatic covid-19 disease medical team may have a weaker protection on the patient's bedside, and this has led to the transmission of the

disease to the treatment staff, and this risk remains strong in postoperative follow-up. However, increased mortality has been reported in these patients with and without symptoms after surgery, so non-surgical treatment is recommended as much as possible [10].

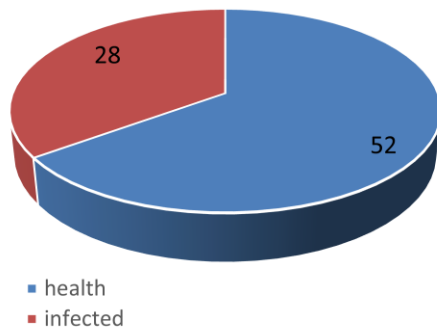


Figure1. Vascular surgeons that involved by COVID-19

Over time, the rate of infection and death from covid has reached a high level [11]. In Italy, 20% of the health team became infected [12] and 154 doctors died [13]. Studies have shown that the presence of corona can cause a lot of stress to the staff [14-16]. At first, the treatment systems were not fully prepared to deal with this stress, but with the onset of the pandemic, basic measures were taken immediately, which were provided according to each country and region [17, 18]. Of course, the response and impact of the pandemic varies from country to country, and the world's major economic powers, such as the United States, Italy, and France, were affected despite their complete health structure [19, 20]. Covid changed all normal treatments in the world's largest centers [21].

Overview of covid effects on various specialist

1. Covid and medical specialists

Prior to this pandemic, various medical groups routinely performed diagnostic and therapeutic measures in accordance with known safety principles, even in patients infected with HIV and hepatitis.

With the onset of this pandemic and the passage of time as complex and numerous signs of the disease emerged, physicians faced three important issues: 1. The large number of these patients, which led to the

closure of the routine work of medical centers to keep hospital beds ready for these patients, 2. High infectivity of Covid 19 disease, which of course the medical staff is also exposed to high infection. 3-pathophysiological properties of this virus, which have led to multiple signs and involvement of various body systems, and in a way, all medical disciplines became involved in this disease. The virus is transmitted through respiratory droplets of patients and has also been observed in blood and other body fluids, although the importance of transmission from these parts is unclear [22].

Due to the rapid transmission of SARS-cov2, the treatment team is exposed to the transmission of this disease, and surgeons as a discipline in the treatment team is no exception to this rule [23].

In the beginning of the pandemic, the involvement of treatment staff was 29%, but gradually decreased due to PPE [24], and the point that the author group saw at our hospital was more staff involvement in non-covid wards than in covid wards, which seems to be due to more observe PPE by covid personnel

We need to know that any infected person can infect 1.5-3.5 other people [25]. And treatment team is three times more likely to become infected than normal people [22].

Involvement of each member of the treatment team can affect the overall functioning of the treatment service. In China and the United States, the first groups to be severely affected were otolaryngologists (ORL) [26, 27]. Studies have shown that otolaryngologists (ORL), oral and maxillofacial, and head and neck surgeons are at the highest risk of transmission [16]. Using a power instrument (a drill, saw or burr) spreads aerosols and droplets that are spread with blood and other liquids that are contaminating [26].

ENT, neurosurgery, orthopedics and ophthalmology operations are at high risk for aerosol production. The risk of transmitting respiratory aerosols to the surgeon is high in the ENT group and ophthalmologists, while in the neurosurgery group the risk is moderate (high for surgery at base of skull or trans-sphenoidal) and in the orthopedic group this risk is low (22). Vascular surgeons who implanted Central Venous Catheter (CVC) identified themselves as at high risk for infection[14]. This is because the vascular surgeon appears to be in contact with both

the patient's bloody secretions and the patient's breathing when placing dialysis access or CVC, which increases the risk of transmitting the disease to the vascular surgeon, and increases the risk when considering a large number of these patients.

2. Covid and vascular surgeons in Iran

Vascular surgeons are an integral part of the hospital front line by performing complex vascular procedures or vascular complications or supporting other surgeries [14], and the surgeon as a team leader or manager is expected to always be in the best health [16]. Experienced and senior vascular surgeons should not be in constant contact with Covid patients so that we lose their help due to quarantine when necessary [28].

According to the Statistics Organization of Iran, the population of Iran is about 81.1 million. The number of active vascular surgeons in the whole country is 80, that is, one vascular surgeon for every one million people, which is lower than other countries. This ratio is 1 per 126,514 populations in the United Kingdom ($n = 522$) (30) and 1.4 per 100,000 people in the US. Those efforts are being made to maintain this ratio [29]. Of course, we also have 7 subspecialty assistant training centers in Iran, where 28 subspecialty assistants are training.

Of course, from the beginning of this disease in Iran (since February 2019) until the writing of this article, 22 of these vascular surgeons, equivalent to 25%, and 14 of this assistances, equivalent to 50%, have suffered from Covid. Some of them have been diagnosed with the disease twice in a very severe condition, and even unfortunately one of our senior colleagues lost his life in this way at the very beginning of the disease. Figure 1 and Figure 2. In order to fully deal with this disease, all clients should be considered sick and PPE should be observed. At the beginning of this disease, our country faced some difficulty in preparing PPE due to US sanctions and sometimes these PPE cases were not fully available in some centers for all medical staff in contact with these patients, which fortunately, with the efforts of local

companies, this problem was solved very soon. With the onset of pandemy, various scientific societies around the world, including the American Society of Surgeons, issued recommendations to shut down routine and elective procedures to provide adequate beds for patients and reduce the risk of transmitting

the virus [30-33]. In Iran, the Iranian Society of Vascular Surgeons, like other large associations, set

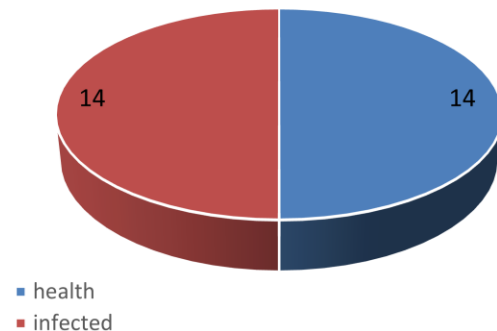


Figure2. Fellowship of Vascular surgery that involved by COVID-19

up a guideline for performing procedures [34]. Except for emergency diseases (aortic aneurysm at risk of rupture and acute and critical limb ischemia with risk of organ gangrene and dialysis accesses) in other surgeries recommended postpone and special emphasis on PPE at all stages in accordance with the protocols of the centers.

However, cancellation of elective actions increases the subsequent morbidity of some diseases[10]. And vascular surgeons as hospital firemen were present in all centers and canceled elective practices [21] and treatments limited to AAA> 5.5 cm chronic limb threatening ischemia with tissue loss, acute ischemia, Dialysis access. Before admission we try to test PCR but it is not possible in all centers. Admission of patients without Covid examination increases the likelihood of treatment team involvement, but PCR testing for all patients is not possible for all countries due to high cost and unavailability of testing [10]. The American surgeons compared to Brazilian vascular surgeons in a larger number of patients after the operation noticed a positive Covid test [14] as we in Iran contact by this issue.

Conclusion

Because the high need of routine and covid-19 patient to vascular surgeons, we should keep us health by observing PPE and prevent direct contact to all patients and rising our knowledge about this disease. In patients that need CVC and dialysis access

because of higher risk of transmission of infection, extreme attention is need.

Author contribution

Conception and design: MH, Data collection: MH, MN, SAM, Writing manuscript: MH, MN, SAM, Critical revision of the article: MH, SAM, Final approval of the article: MH, MN, SAM

Conflict of Interest

Authors declare no conflicts of interest.

Ethical declaration

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