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Study of clinical features of patients with COVID-19 hospitalized in an educational hospital in Iran

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Abstract:

BACKGROUND: The outbreak of new pathogens or the resurgence of pathogens that have already spread is a serious challenge to public health. Coronavirus is a pathogen that seems to invade the human respiratory system in the first place. Coronaviruses form a large family and are so called because of the presence of crown like cristae on their surface.

MATERIALS AND METHODS: This is a cross-sectional, descriptive study conducted to assess the status of patients with COVID-19 who were hospitalized in an educational hospital. For this purpose, 142 patients hospitalized in this hospital were followed up 2 weeks after discharge and were inquired about the symptoms they had upon admission to the hospital, the number of hospitalization days, the history of underlying disease, and so on. Descriptive data analysis was done with the SPSS software version 22.

RESULTS: The findings of this research showed that overweight or obese people (about 66%) is more likely to contract the disease. It also seems that older people (37.3% older than 60 years old) and those with a history of diseases (69.6%) such as diabetes, high blood pressure, or heart disease are more prone to COVID-19. The most common symptoms of COVID-19 patients included fever (64.5%), shortness of breath (67.4%), and dry cough (50.4%).

CONCLUSION: it seems that high risk group (obese people, old people, and people with a history of disease) is more likely to be infect with coronavirus so they should more careful than others. Another important issue is that policy-makers must play an active role in public awareness of dangers of COVID-19 and ways to prevent it.

Keywords:

Clinical features, coronavirus, COVID-19, hospital, inpatient

Introduction

The outbreak of new pathogens or the resurgence of pathogens that have already spread is a serious challenge to public health. Coronavirus is a family of viruses that have disseminated in societies several times. Coronaviruses are a group of RNA viruses that can widely expand among humans, mammals, and birds.^[1] Coronavirus is a pathogen that seems to invade the human respiratory system in the first place. Coronaviruses form a

large family and are so called because of the presence of crown like cristae on their surface. Severe acute respiratory syndrome coronavirus 1 (SARS-CoV-1) and MERS-CoV are two coronaviruses that caused widespread outbreaks of SARS and Middle East Respiratory Syndrome, respectively. SARS spread to 17 countries and caused a total of 774 deaths and MERS was also observed in 27 countries. In late December 2019, a group of patients with the symptoms of pneumonia from an unknown source visited a hospital in China.^[2] Preliminary studies indicated that

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the patients were somehow associated with a wholesale seafood center in Hubei Province of China.^[3] The virus was named N-cov19 due to the new features it had relative to previous coronaviruses.

The symptoms of the first patients with N-cov19 were similar to those of viral pneumonias.^[4] Initial observations of COVID-19 showed that the disease has milder symptoms in younger people. Moreover, a majority of people who succumb to the disease are the elderly or those suffering from an underlying disease, which appears to be due to the fact that these patients have a less efficient immune system than other patients.^[5]

COVID-19 rapidly expanded with the detection of the first cases of new coronavirus in Wuhan (Hubei Province, China). In fact, it seems that a main difference of the new coronavirus with other members of coronavirus family is the higher expansion capacity that affects a large number of people.^[6] The important point is that there is no definitive cure or vaccine for this disease, although extensive efforts are dedicated worldwide to find a drug or vaccine for this disease. Considering the above statements, it seems that the best way to prevent the spread of COVID-19 at the moment is to cut the transmission chain of this virus among people.^[7]

Despite all studies that have been done about coronavirus, it seems that there is still no complete information about the behaviour of this virus but the obvious thing is that this virus has spread rapidly and has a high mortality rate among high risk people.

It seems that the best ways for fighting coronavirus are: using mask, social distance, quick identification of people with COVID-19 and isolating them and preventing aggregation.

Also more people with COVID-19 experience different symptoms such as: fever, cough, shortness of breath headache, and diarrhea, but many of the features of COVID-19 are still unknown to the public. One of the benefits for recognizing symptoms of COVID-19 is that we can screen people better than before. The aim of this study was to examine inpatient people with COVID-19 hospitalized in one of the hospitals dedicated to these patients.

Materials and Methods

This study is a cross-sectional, descriptive research meant to examine the condition of patients with COVID-19 in an educational hospital (Amir Alam Hospital) in 2020. For this purpose, the patients who were hospitalized in this hospital were followed up 2 weeks after their discharge and were interrogated about their symptoms when

admitted to the hospital, the number of hospitalization days, the history of the underlying disease, and so forth. SPSS software version 22 produced by IBM (New York State, New York city, USA) was used for the data analysis.

To interview the patients, a questionnaire was designed. This questionnaire was a guide for interviewing patients. This questionnaire consisted of two parts: the first part was consisting of: date of admission, age, sex, and file number. The second part was consist of 22 questions consist of information about, symptoms with which the patient visited the hospital, height and weight of the patient, disease background, medication background, symptoms 2 weeks after discharge, medication prescription, etc., The questionnaire was developed and approved with the help of various specialists such as an intensive care unit (ICU) specialist, quality improvement officer of the hospital, patient safety co-ordinator, and a pulmonologist. In the next step, the patients were contacted based on the phone number they had given to the hospital at the time of admission. A total of 320 hospitalized patients were contacted. The phone numbers of some patients were incorrect, a few patients did not respond to hospital calls, and some others refused to co-operate due to serious conditions or death of their patients. Overall, 142 patients provided complete information that were fed into the SPSS software and analyzed using the descriptive statistics.

At the beginning of the interview, patients were explained that their information will be confidential.

One of the limitations of this study was that many patients did not like to answer the questions so that we tried to convince them.

Results

As shown in this Table 1, only 32.6% of patients with COVID-19 who were hospitalized had normal weight and more than 33% of patients suffered from obesity.

Table 2 shows the age, gender, and history of underlying disease among COVID-19 patients who were hospitalized.

As shown in this table, 65.5% of the hospitalized patients were male and 34.5% were female. With respect to the age group, more than 37% of patients who were hospitalized due to COVID-19 were >60 years old. Furthermore, approximately 70% of the hospitalized patients had a history of underlying disease.

Table 3 shows the type of underlying disease of hospitalized COVID-19 patients in the hospital in question. The important point about this Table is that many people had more than one underlying disease.

Table 1: Body mass index of coronavirus disease-19 patients

Row	BMI	n (%)
1	under 18.5	2 (1.4)
2	25-18.5	45 (32.6)
3	30-25	45 (32.6)
4	35-30	37 (26.8)
5	35-40	5 (3.7)
6	>40	4 (2.9)
Total		138 (100)

BMI=Body mass index

Table 2: Demographic information of people with COVID-19

Row	Features	Title	n (%)
1	Gender	Male	93 (65.5)
2		Female	49 (34.5)
3	Age	21-30	11 (7.7)
4		40-31	17 (12)
5		41-50	26 (18.4)
6		51-60	35 (24.6)
7		61-70	28 (19.7)
8		>71	25 (17.6)
9	History of disease	Yes	99 (69.7)
10		No	43 (30.3)

Table 3: The frequency of the underlying disease in people with COVID-19

Row	Underlying disease	Percentage
1	Hypertension	40
2	Diabetes	34.7
3	Heart disease	32.3
4	Thyroid disease	12.1
5	Neural disease	10
6	Pulmonary disease	9.1
7	Hepatic disease	6.1
8	Immune system disease	2
9	Cancer	2
10	Renal disease	1
11	Other	11.2

As shown in this Table, among people with a history of underlying disease, hypertension was the most common underlying disease (40%), followed by diabetes.

Table 4 shows the symptoms of hospitalized patients upon their visit to the hospital.

As shown in the Table 4, the most common symptoms of COVID-19 patients upon admission to hospital were shortness of breath, fever, and a dry cough.

Two weeks after discharge, patients were interviewed, with 66.9% stating the presence of some disease symptoms.

Discussion

SARS-CoV-2 is a new coronavirus, and many of its traits are still unknown. Since there is no definitive vaccine or treatment for COVID-19, the most important way to fight it is to cut off the transmission chain. One way to identify the behavior of the new coronavirus is to examine patients with the disease. Therefore, the aim of this study was to investigate the status of hospitalized patients in one of the hospitals dedicated to COVID-19 patients.

The findings of this research showed that nearly one-third of people admitted to the hospital with COVID-19 had a body mass index (BMI) >30 and were actually obese. On the other hand, about two-thirds of patients (66%) were overweight. The results are in line with Simonnet *et al.* study that was conducted in 2020 in France. In their study at a hospital for COVID-19 patients, the researcher found that people with BMI >30 were more susceptible than others to severe COVID-19 and were admitted to the hospital's ICU. According to the findings of this study, 47.6% of people in a severe condition of COVID-19 admitted to the ICU had BMI >30 and 28.2% of them had BMI >35.^[8]

A reason why people with obesity are more likely to develop severe COVID-19 needing hospitalization or even special care is that obesity can compromise the immune system and hence the new coronavirus can easily exacerbate the disease in the body of these people.

In terms of gender of people hospitalized for COVID-19, the results showed that nearly 65% of those hospitalized were men and nearly 35% were women. In an article published by Wenham *et al.* in Lancet in March 2020, it was stated that there is not much difference in the number of patients with COVID-19 between men and women but that men are more likely to develop the serious form of disease and be deceased. The reason for this difference in gender is probably due to immunological differences as well as high-risk behaviors such as smoking in men. Obviously, it should be borne in mind that we cannot state this hypothesis with certainty because our data on this disease are still incomplete.^[9] It seems that with the information obtained so far about this disease, men are more at risk than women, although the difference does not appear to be significant.

In terms of age, the study found that 37.3% of people who were in need of hospitalization were over 60 years old. In this regard, the findings of this research are fully consistent with a study conducted in 2020 at a center for COVID-19 patients in Wuhan, China, in which 37% of those admitted to the hospital were over the age of 60.^[6] Perhaps, senior citizens are more prone to develop a more severe COVID-19 condition than others because

Table 4: Symptoms of hospitalized patients while hospital admission and 2 weeks after discharge

Symptoms in hospitals	n (%)	Symptoms 2 weeks after discharge	n (%)
Shortness of breath	95 (67.4)	Cough	47 (51.6)
Fever	91 (64.5)	Shortness of breath	38 (41.8)
Dry cough	71 (50.4)	Weakness and lethargy	26 (28.6)
Weakness and lethargy	61 (43.3)	Fever	6 (6.6)
Trembling	47 (33.3)	Sore throat	3 (3.3)
Body pain	33 (23.4)	Trembling	3 (3.3)
Diarrhea and vomiting	26 (18.4)	Diarrhea and vomiting	3 (3.3)
Headache	21 (14.9)	Body pain	2 (2.2)
Sore throat	13 (9.2)	Headache	2 (2.2)
Olfactory and taste disorders	12 (8.9)	Runny nose	1 (1.1)
Others	11 (7.8)	Others	2 (2.2)

the immune system of older people is weaker than that of young people.

In terms of underlying disease in patients admitted to this hospital, nearly 70% of individuals have had at least one underlying disease. In a study conducted by Wang at a reception center for patients with COVID-19 in Wuhan (China), 46.4% of the 138 people admitted to the hospital had at least one underlying condition, which is significantly different from the findings of our study.^[10] Moreover, among those with an underlying disease, high blood pressure, diabetes and cardiovascular disease were more common. In this regard, the findings of this study are consistent with Liu’s study conducted in Hubei Province, China. In the mentioned research, the most prevalent underlying diseases among patients were hypertension, diabetes, and heart disease.^[11]

In a study by Guan *et al.* in China reviewing 1099 definitive COVID-19 patients from 552 hospitals in 31 Chinese provinces, hypertension and diabetes were the most common underlying diseases, which is in line with the present study.^[12]

The present study also found that the symptoms of cough, shortness of breath, weakness, and lethargy were more likely to persist while other clinical symptoms of the disease such as fever often disappear after 2 weeks of hospital discharge.

In terms of the symptoms that patients experienced when admitted to the hospital, the findings of this study showed that shortness of breath, fever and dry cough were more prevalent, which is consistent with the study of Chen *et al.*^[6] However, in the study of Wang *et al.*, the most common symptoms of patients with COVID-19 were fever, fatigue, and dry cough.^[10]

The most frequent symptoms related to COVID-19 appear to be fever, dry cough, and shortness of breath, although patients with gastrointestinal symptoms have recently been admitted to hospitals.

The most important limitation of this study was that almost half of the patients were not willing to interview and respond to the researcher for various reasons.

The most important weakness of this study is that, this research just described symptoms and underlying disease in patients with COVID-19 and the impact rate of factors on severity of this disease in unknown.

The most important strengths of this study are that in this research, we identified risk factors that can effect for the severity of COVID-19 disease in a real environment.

Conclusion

The findings of the present study showed that although all people have to follow health protocols to prevent COVID-19, people with an underlying disease appear to be higher risk of developing the disease and undergoing severe conditions. Furthermore, obesity or overweight is one of the factors that can be effective in contracting this disease. It seems that with increasing age, the risk of developing COVID-19 increases due to immune system compromise.

The important issue is that it seems that many people still do not take the risk of COVID-19 disease seriously. Policy-makers should design educational plan for people awareness about the risks of COVID-19

Given the higher risk of COVID-19 among the above-mentioned people, they must be more careful and do not leave the house unless necessary. The most common symptoms of COVID-19 are fever, dry cough, and shortness of breath; however, this research showed that weakness and lethargy, chills and body pain are also common symptoms of COVID-19. Cough, shortness of breath, weakness, and fatigue are other symptoms of the disease that appear to improve later than other symptoms while the fever disappears after a while.

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Conflicts of interest

There are no conflicts of interest.

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