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Clinical Presentation of Iranian Patients Affected with COVID-19: A Thousand Faces Disease

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ABSTRACT

The coronavirus disease 2019 (COVID-19) pandemic in Iran is part of the worldwide pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The present study aimed to demonstrate the clinical characteristics of patients affected by COVID-19, in our tertiary teaching hospital.

Medical records and compiled data of 668 patients with suspected COVID-19 were obtained retrospectively between January to April 2020. The present study outcomes included demographic features of infected patients, underlying diseases and conditions, the relationship between the results of reverse transcription-polymerase chain reaction (RT-PCR) or CT-scan with the manifestations of the disease, mortality rate, and age distribution of fatalities among men and women.

The median age of hospitalized patients was 63 years old (from 18 to 94). The patients' chief complaints in the admission time were cough, dyspnea, fever, and gastrointestinal problems, respectively. Hospitalized patients' common comorbidities were hypertension (HTN), and cardiovascular disease (CVD) (24%), diabetes mellitus (DM) (21.5%), asthma, or chronic obstructive pulmonary disease (COPD) (6%), or other underlying diseases (15.5%). One-third of patients had no comorbidity according to the data of medical records. In hospitalized patients, 169 (84.5%) had positive RT-PCR, and 156 (78%) had positive chest CT findings. The mortality rate of males was higher than females (66.3% vs. 33.3%) and in patients with positive RT-PCR compared to patients with positive chest CT-scan findings. The majority of deaths had a history of DM or HTN/CVD in their medical records.

The chief complaint of patients was cough. DM and HTN or CVD were the common underlying disease related to death in hospitalized cases. Besides, the hospitalization and mortality rate in males was higher than in females. About 87% of dead hospitalized cases had positive RT-PCR results, and this rate was 82% for chest CT results.

Keywords: Coronavirus disease 2019 (COVID-19); Iran; Mortality

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INTRODUCTION

The COVID-19 pandemic in Iran is part of the worldwide pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).[1] On 19 February 2020, Iran reported the first confirmed cases of infections in Qom.[2] This infection spread rapidly all over the country. Tabriz, a city located in the northwest of Iran, was also affected by this contagious virus. Early in the epidemic, the virus has only affected the upper respiratory tract with the most common symptoms such as cough, fever, dyspnea, development of pneumonia, and acute respiratory distress syndrome. Over time, cases with other different symptoms were reported. Fatigue, headache, hemoptysis, acute cardiac problems, multi-organ failure, gastrointestinal symptoms (i.e., diarrhea, vomiting, abdominal pain, and loss of appetite), skin rashes, and neurological manifestations (i.e., febrile seizures, convulsions, change in mental status, encephalitis, and myalgia) were the most common clinical presentations in the affected patients.[3] To date (28 June 2020), over 503,000 people worldwide died due to COVID-19, while more than 5.5 million people have recovered. However, due to a large number of undiagnosed cases, the actual fatality rate of the disease is likely to be lower than the now death-to-case ratio. The main cause of death in people with COVID-19 is respiratory failure.[4]

Based on our knowledge, there is no evidence about the clinical presentation of COVID-19 in Tabriz city of Iran. The present study aimed to demonstrate the clinical characteristics of patients affected with the "thousand faced" COVID-19 and their fatality rate in Imam Reza tertiary teaching hospital between January 20, 2020, and April 21, 2020.

MATERIALS AND METHODS

In this cross-sectional study, we obtained the medical records and compiled data of suspected COVID-19 cases referred to our teaching hospital retrospectively between January 20, 2020, and April 21, 2020. The local ethical committee of Tabriz University of Medical Sciences approved the present study (Code: IR.TBZMED.REC.1398.1276).

We extracted the patient's clinical symptoms and laboratory data on admission from electronic medical records and analyzed the data in two categorical groups: Hospitalized suspected COVID-19 cases (group 1); Outpatients plus hospitalized patients (group 2).

Confirmed case of COVID-19 defined as a positive result on real-time reverse transcriptase–polymerase-chain-reaction (RT-PCR) assay of nasopharyngeal swab specimens (RT-PCR test kit; Sansure biotech) or chest CT- imaging (ground-glass opacities, multifocal patchy consolidations, and/or interstitial changes with a peripheral distribution) (Siemens Healthineers, Germany).

The present study's outcomes included demographic features of infected patients, underlying diseases and conditions, the relationship between the results of RT-PCR or CT-scan with the manifestations of the disease, mortality rate, and age distribution.

We summarized Categorical variables as counts and percentages. Since the cohort of patients in our study was not derived from random selection, all statistics were deemed to be descriptive only. All the analyses were performed using SPSS software (SPSS 21, SPSS Inc., Chicago, IL, USA). The statistical significance level in all tests was 0.05.

RESULTS

Results of Only Hospitalized Patients (Group 1)

We analyzed the data of hospitalized patient's medical records. Among 200 evaluated medical records, 85 (42.5%) cases were female, and the remaining patients were male.

The median age of hospitalized patients was 63 years old (minimum: 18, maximum: 94). According to the results of the Mann-Whitney U test, there was no statistically significant between the age of both sex in hospitalized patients (p=0.708).

The chief complaint of patients was cough (51.0%). The other complaints of hospitalized patients at admission time were dyspnea (45.5%) and fever (24.6%). The remained patients had other complaints when referred to our hospital. Hospitalized patients common comorbidities were hypertension (HTN), and cardiovascular disease (CVD) (24%), diabetes mellitus (DM) (21.5%), asthma, and chronic obstructive pulmonary disease (COPD) (6%), other underlying diseases (15.5%), and 33% had no comorbidity according to the data of medical records. In hospitalized patients, 169 (84.5%) had positive RT-

PCR, and 156 (78%) of cases had positive chest CT findings.

The majority of hospitalized cases were in the age range of 60-79 years old (n=88, 44.9%). Moreover, this age group's mortality rate was higher than the others (n=p 23, 62.2%) (Figure 1). The mortality rate of males in hospitalized patients was higher than women (66.7% vs. 33.3%) (Figure 2). The common comorbidity in dead cases was DM (35.9%). HTN, CVD (23.1%), asthma or COPD (7.7%), and other underlying diseases (7.7%) were in the next rank. However, approximately one-fourth of deaths had no history of the underlying disease (Table 1). About 87% of dead hospitalized cases had positive RT-PCR results, and this rate was 82% for chest CT results.

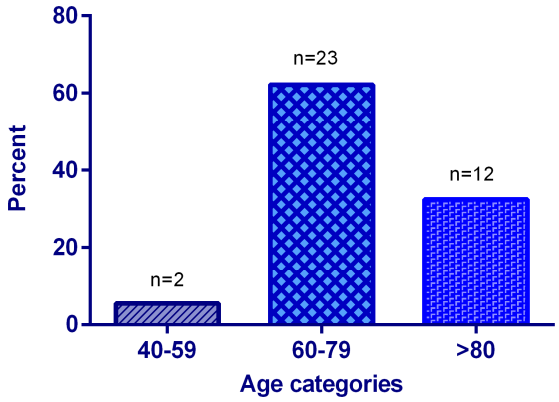

Figure 1. The case fatality rate in hospitalized patients with COVID-19 in different age groups (n=200).

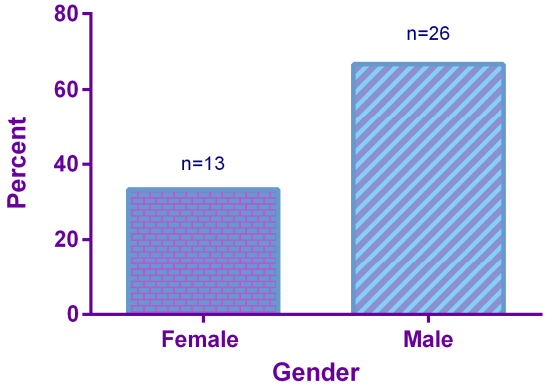

Figure 2. Percentage of sex in death cases with COVID-19 (n=200).

Table 1. Underlying disease in dead cases of hospitalized patients with COVID-19 (n=78).

The history of underlying diseases N (%)					
DM	HTN/ or CVD	Asthma and COPD	Others	No history	Total
14 (35.9)	9 (23.1)	3 (7.7)	3 (7.7)	10 (25.6)	39 (100)

DM: diabetes mellitus; HTN: hypertension; CVD: cardiovascular disease; COPD: chronic obstructive pulmonary disease

Outpatients Plus Hospitalized Cases (Group 2)

We obtained the electronic records of outpatients or hospitalized 668 suspected COVID-19 cases (based on RT-PCR or chest CT-imaging) from our teaching hospital, and among them, 376 cases (56.3 %) were male. The Mann-Whitney U test results showed no significant age difference between men and women (p=0.519).

In cases with positive RT-PCR test, 57.8% were male, and this rate was 66.3% in the cases with positive chest CT imaging.

The patients' chief complaints in the admission time were cough, dyspnea, fever, and gastrointestinal problems, respectively. However, nearly one-third of patients reported other symptoms, including myalgia, sore throat, weakness, vomiting, abdominal pain, and fatigue.

The infected patients' medical records showed that most outpatients cases did not report any history of underlying diseases (n=377, 56.4%). However, HTN, CVD (15.1%), DM (13.5%), and asthma, or COPD (6.3%) were the common comorbidities in hospitalized patients.

The age distribution of cases fatality showed that the mortality rate was higher in the age range of 60-79 years old. The summary of its trend is presented in Figure 3.

An independent T-test was used to evaluate the age-sex mortality rate. There was no significant sex difference in the mean age of death (p=0.841). The summary of its trend is illustrated in Figure 4. The cumulative mortality rate in evaluation time is illustrated in Figure 5.

In terms of mortality, we analyzed the presence of underlying diseases (Table 2).

We also analyzed the percentages of underlying disease in cases with positive RT-PCR results. The majority of patients with positive RT-PCR results did not have any history of medical problems (44.6%). However, in the rest of the patients, hypertension (HTN) or cardiovascular diseases (CVD) (21.4%) and diabetes mellitus (DM) (17.3%) were the common comorbidities.

In patients with positive chest CT-scan, nearly half of the patients did not have any underlying disease (44.2%). Similar to the results of RT-PCR, 18.9 % had a history of hypertension or cardiovascular diseases, and 17.7% were diabetic.

The results of Pearson Chi-Square demonstrated that 66.3% of patients with positive RT-PCR had positive chest CT-scans, and 81.3% of patients with negative RT-PCR tests also had negative CT-scans (p<0.001).

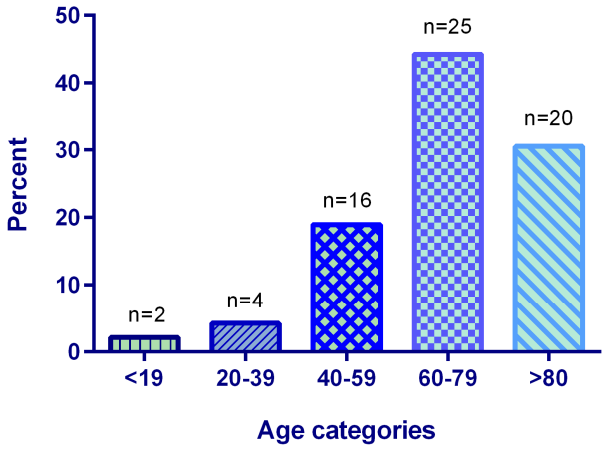

Figure 3. The case fatality rate in different age groups in outpatients and hospitalized patients with COVID-19 (n=668).

Table 2. Underlying disease in dead cases of outpatients and hospitalized patients (n=668).

The history of underlying diseases N (%)					
DM	HTN and/or CVD	Asthma and/or COPD	Others	No history	Total
20 (20.6%)	13 (13.4%)	14 (14.4%)	10 (10.3%)	40 (41.2%)	97 (100%)

DM: diabetes mellitus; HTN: hypertension; CVD: cardiovascular disease; COPD: chronic obstructive pulmonary disease

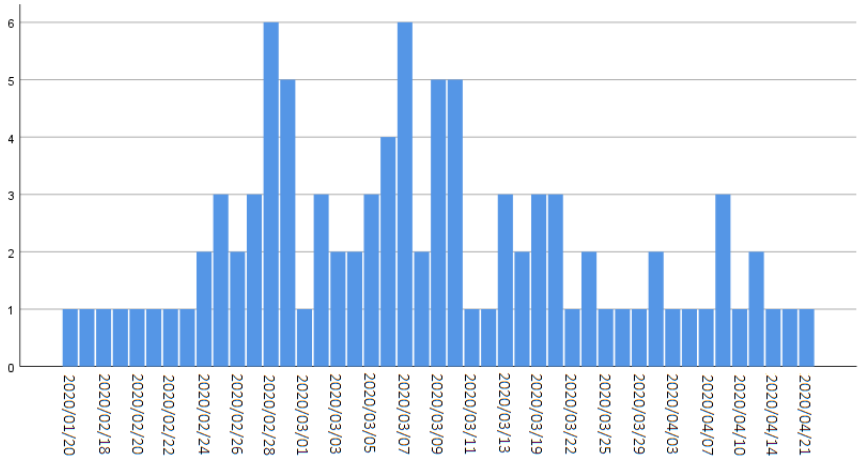

Figure 4. The trend of patient's death of patients with COVID-19 (n=668).

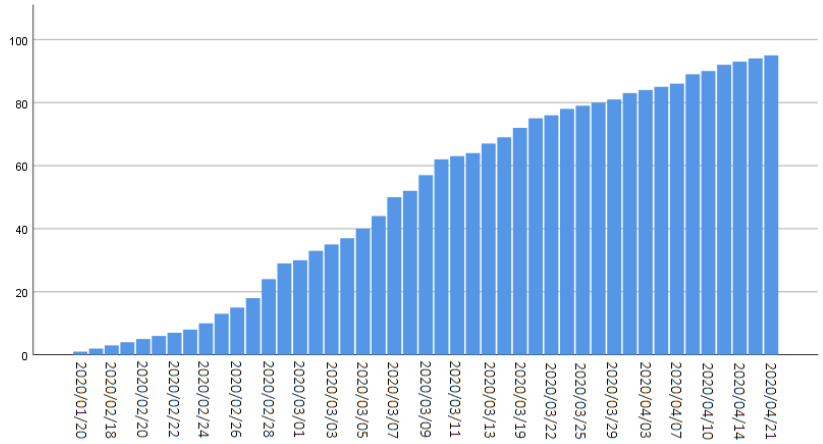

Figure 5. The cumulative mortality rate of patients with COVID-19 (n=668).

DISCUSSION

Right now, the world is collectively fighting an enemy that is invisible, non-selective, fast-moving, and indiscriminate. The virus kills young and old of any race, status, without any respect for geographical or political boundaries.

According to the statistics, the total number of coronavirus cases in Iran since the first confirmed COVID-19 cases is 257, 303. Also, 12, 829 deaths and 219, 993 recovered patients have been reported.[5] These amounts are rapidly increasing. Therefore, identifying the risk factors of this disease is a top priority. The clinical presentations of COVID-19 have ranged from asymptomatic/mild symptoms to severe illness and mortality. Fever, cough, and shortness of breath are common symptoms of the disease. Other symptoms, such as malaise and respiratory distress, have been reported, too.

In our survey, dyspnea and cough were the common chief complaint, which was consistent with the manifestation of lower respiratory tract infections, while non-specific symptoms such as vomiting, abdominal pain, and weakness occurred in the others. Jin et al.,[6] in their study on 43 patients, showed that fever (95.3%) and cough (65.1%) were the most common symptoms. Similarly, Shi et al. concluded there was no gender or age difference in hospitalized patients with COVID-19, and the most common symptoms at onset were fever and dry cough [7] However, in the study by Li et al. fever (88.5%), cough (68.6%), muscular pain and fatigue (35.8%), expectoration (28.2%), and dyspnea (21.9%), were reported as main clinical symptoms in infected patients.[8] In another study, of the 158 participants in Italy, fever in 97 (61%), cough in 88 (56%), and dyspnea in 52(33%) were observed.[9] We analyzed the data from electronic or medical records of outpatients and hospitalized cases regarding clinical findings and mortality rates. The main underlying disease, which was present in death, was DM. However, in the data analysis in outpatients and hospitalized suspected COVID-19 cases, less than half of patients had no previous medical history. Since history taking in outpatients cases may be incomplete; thus our results showed that less than half of patients had not any underlying disease. However, in those with underlying diseases, DM, HTN, CVD, asthma, and COPD were common comorbidities. Our findings also showed that the other common underlying diseases were immune-compromised status and cancers. Inline, in the systematic review and meta-analysis study conducted by Emami et al. [10] on 76993 patients, the following diseases including, HTN, CVD, DM, smoking, COPD, malignancy, and chronic kidney diseases, were reported as the most prevalent diseases among patients with COVID-19. However, these results were consistent with the study results by Shi et al. (7). The conducted studies in this field demonstrated the proportions of people with underlying health conditions among COVID-19 cases with severe disease and death. However, this cannot be interpreted directly as a risk factor.[11]

Our results showed that more than half of the patients were male. Besides, the positive RT-PCR test results, chest CT-imaging findings, and mortality rate in males were higher than those of females. These results align with Jin's [6] study that indicated men are more at risk for worse outcomes and death, independent of age, with COVID-19.

The present study evaluated the mortality rates in cases with positive RT-PCR or CT-scan. It showed that approximately half of the death had positive RT-PCR or chest CT results. Similarly, in a cohort study conducted by Ai et al., the positive rate of RT-PCR assay to the diagnosis of patients suspected to infect with COVID-19 was 59%, while this rate in chest CT was about 88%. [12]

Our results showed that the hospitalization rate and mortality rate were increased with aging. Previous studies showed that the mortality rate is increased with aging. According to the Korea Centers for Disease Control and Prevention, the case fatality rate in 11,344 confirmed COVID-19 cases on May 28, 2020, was 10.9% in patients aged 70–79 years, and 26.6% in patients ≥80 years.[13] The case fatality rate in China on 44,672 cases on February 11, 2020, was 8.0% and 14.8% in patients aged 70 – 79 years and aged ≥80 years, respectively. [14] This rate in Italy's health institute on March 26, 2020, was16.9% in the age group of 70–79 years, and 24.4% in ≥80 years.[15] However, our results showed that the highest mortality rate is seen in the 60-79 years old age category, which contradicts the previous studies. This contradiction may be due to an incomplete follow-up period in which the discharged older cases may re-hospitalized later, and their outcomes did not evaluate. Another reason may be related to the single-center feature of the current study.

One of the limitations of our study was related to its retrospective design. We conducted our study at a single-center, and the data were gathered from medical records that may lead to incomplete results. Another limitation was the lack of consistent follow-up of our patients, which limited us from inquiring into the recovery time or the outcome.

In conclusion, in the present study, we found that the chief complaint of patients was cough. DM and HTN or CVD were common underlying diseases related to death in hospitalized cases. Besides, the hospitalization and mortality rate in males was higher than in females. About 87% of dead hospitalized cases had positive RT-PCR results, and this rate was 82% for chest CT results.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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None.

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