

A Retrospective Evaluation of People with COVID-19 in Northwest Syria

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Abstract

Aim: In our study, in Northwest Syria, where healthcare is provided with humanitarian support, with investigating the demographic and clinical characteristics of people who has been detected Coronavirus disease-2019 (COVID-19), we investigated their situation in the pandemic.

Materials and Methods: The demographic and clinical characteristics of people whose COVID-19 polymerase chain reaction (PCR) tests were studied and found positive in the World Health Organization supported assistance coordination unit laboratories in Northwest Syria, were retrospectively investigated. All patients except healthcare workers were included in the study between 01/05-22/12/2020.

Results: 17,070 non-healthcare workers who were positive for COVID-19 PCR were included in the study. 6.368 (37.3%) of the participants were female and 10,702 (62.7%) were male. The average age of the participants was 37.7 ± 16.4 years. The data obtained that there were 1.090 (6.4%) people hospitalized or undergoing isolation. When comorbid diseases were investigated, hypertension was found in 435 (2.5%), diabetes in 426 (2.5%), and heart disease in 139 (0.8%) people. When evaluated in terms of prognosis, 56% (n=9584) of the patients showed complete recovery, 41.8% (n=7141) recovered and their symptoms persist, but 345 (2%) patients died of COVID-19, including 106 of them are women (female crude death rate: 1.6%) and 239 of them are men (crude death rate: 2.23%).

Conclusion: In our study, we presented a cross-sectional analysis of almost all people with COVID-19 in the last half of the 2020 by investigating the demographic and clinical characteristics of people with COVID-19 in Northwest Syria. COVID-19 diagnoses were evaluated according to the PCR test result.

Keywords: COVID-19, Syria, pandemic

Introduction

Coronavirus disease-2019 (COVID-19), first detected in Wuhan, China, in the last quarter of 2019, emerged as a global threat and was declared a pandemic by the World Health Organization (WHO) (1). WHO specified the rate of increase of pandemic cases, noting that the 100,000th case was reached on the 67th day after the discovery of the first case, the 200,000th case was reached in the next 11 days, and the 300,000th case was reached in the next 4 days and 400,000th case in the next 2 days (2,3). Although the fight continues worldwide, the COVID-19 pandemic has infected more than 115 million people and killed 2.56 million people in 223 countries and territories by early March 2021 (4).

Although the number of cases increased exponentially in many countries, countries implemented different strategies depending on their capacities and the state of their existing health infrastructure (5).

To prevent this situation, 1.7 billion people (almost 20 percent of the world's population) had to be quarantined. To control the virus, borders are closed and strict measures have to be taken by closing markets, schools, and public facilities (2). The COVID-19 pandemic has pushed even the most advanced healthcare systems to their limits and overwhelmed the strongest economies. Democratic states struggle with severe restrictions to ensure compliance (6).



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While it is difficult for developed countries to combat the epidemic, the epidemic has a devastating impact on the health systems of middle- and low-income countries, particularly those affected by conflict. While many high-income countries struggle to implement effective public health interventions, countries are experiencing internal unrest and conflict face additional challenges (7). Northwest Syria has a population of approximately 4.17 million. An estimated 1.5 million people live in migrant camps in the region. In the refugee camps, where more than 75% of the people are women and children, there are difficulties in providing health services due to overcrowded and inadequate conditions. Taking into account the damaged infrastructure and inadequate settlements, Northwest Syria is considered a vulnerable region in terms of public health.

In Syria, where there are different health systems in different regions, the northwestern region is under the control of the opposition Syrian National Coalition (8). The region's health system is maintained through the support of neighboring countries and the WHO. WHO has a two-billion-dollar program called the Global Humanitarian Response Plan for the supply of laboratory test materials, protective materials for medical personnel and equipment to vulnerable countries as part of the pandemic response (2).

In this context, with the support of the WHO, Syria's neighboring countries and international non-governmental organizations, studies have been conducted in the framework of humanitarian aid to promote the health of the Syrian population. In 2013, Early Warning Alert and Response Network (EWARN) was established, which is used to monitor communicable diseases in Northwest Syria. EWARN is located in opposition-controlled areas and is organized by the assistance coordination unit (ACU), which is part of the Syrian National Coalition. This is an early warning system for many infectious diseases such as COVID-19. EWARN was activated for rapid triage, investigation and verification of suspected cases of COVID-19 and enabled the operation of WHO's COVID-19 polymerase chain reaction (PCR) laboratories according to regional needs (3,9).

Most of the published literature on COVID-19 comes from high-income countries, while less attention has been paid to countries with weaker health systems (7). With this in mind, we investigated the situation in the pandemic by examining the demographic and clinical characteristics of individuals who had COVID-19 in Northwest Syria, a country that is not under a central health system and where health services are provided with humanitarian aid.

Materials and Methods

This study retrospectively examined the demographic and clinical characteristics of individuals who applied to the WHO-supported ACU laboratories in the Northwest Syria Region and were diagnosed with COVID-19.

All patients, excluding healthcare workers, who applied to these laboratories between 01/05/2020-22/12/2020 and whose test results were positive were included in the study. The demographic and clinical data of the subjects were searched in the EWARN digital database. Permission to use the data was obtained from the ACU Monitoring Coordinator on 24/12/2020. Ethics Committee approval for our study was obtained from the Non-Interventional Research Ethics Committee of Mustafa Kemal University of Hatay on 03/12/2020 (meeting number: 01, decision number: 22, date: 14.02.2021).

Statistical Analysis

Statistical analysis of the study were performed using Statistical Package Software for Social Sciences version 21.0 for Windows (IBM SPSS Statistics for Windows, version 21.0. Armonk, NY: IBM Corp., USA). Explanatory statistics of continuous variables were summarized as mean±standard deviation, and explanatory statistics of categorical variables were summarized with numbers and percentages.

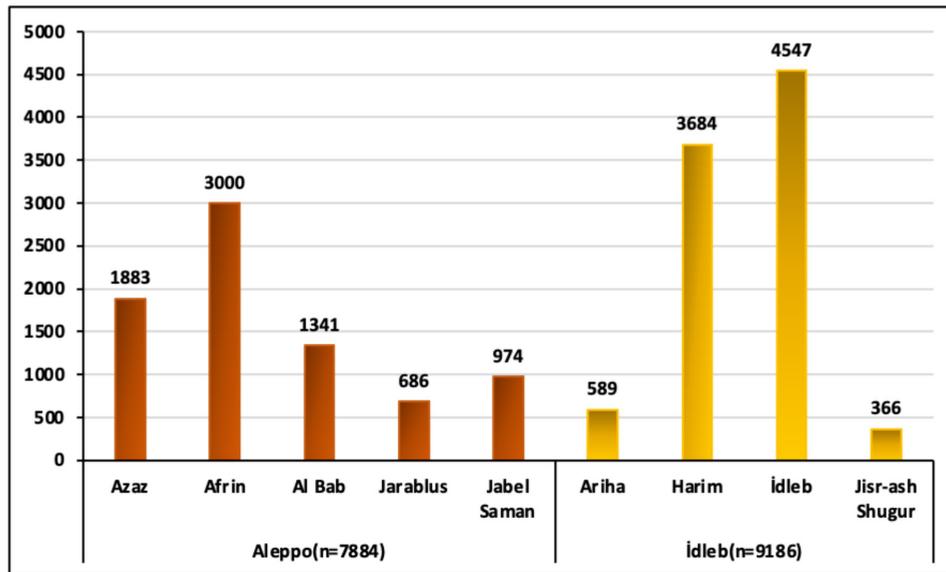
Results

The study included 17,070 individuals who were not healthcare workers and were positive for COVID-19 PCR. The mean age of the patients was 37.7 ± 16.4 years, and 6,368 (37.3%) were female and 10,702 (62.7%) were male. When searching the occupational groups of the participants in the database, although the occupational group could not be specified for most (40.5%), 1,273 (7.5%) were civil servants, 733 (4.3%) were teachers, and 689 (4.0%) were students.

Of those included in the study, 9,186 (53.8%) were from the Idlib Region and 7,884 (46.2%) were from the Aleppo Region (Graphic 1). 10.7% (n=1826) of those living in these regions lived in immigrant camps.

71.6% (n=12216) of the PCR samples were nasopharyngeal swabs and the remainder were bronchoalveolar lavage samples. Of these samples, 4,622 (27.1%) were tested in Afrin, 8,595 (50.4%) in Idlib and 3,231 (18.9%) in Jarablus laboratories. It was reported that 1,090 (6.4%) of these patients were hospitalized or isolated.

Regarding origin, 40 patients had history of visiting another region within 14 days, 11 had history of receiving visitors from another region within 14 days, 4,928 (28.9%) had a history of



Graphic 1. Number of cases by region

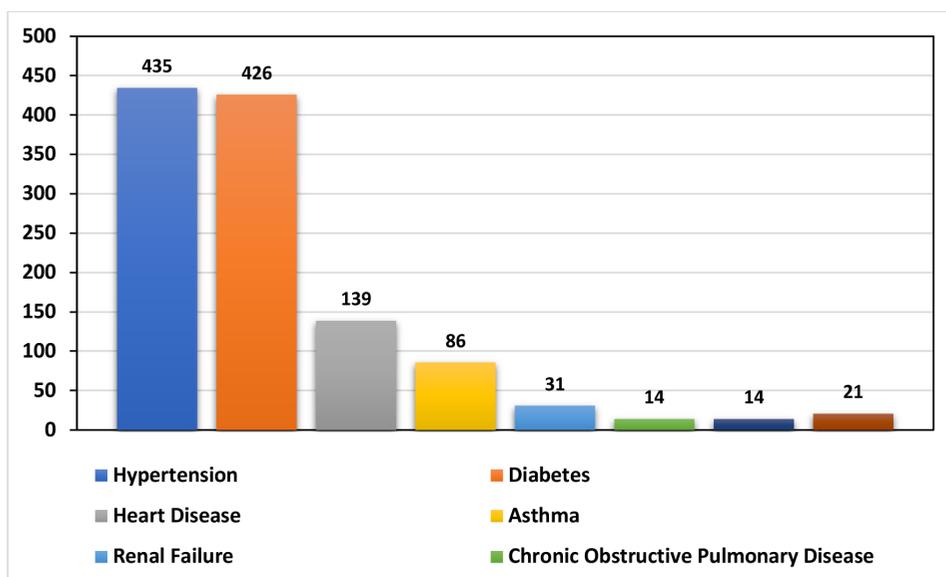
visiting an endemic area, and 2.673 (%15.7) had a history of contact with a COVID-19 positive patient.

When the symptoms of those included in the study were evaluated, 96.3% (n=16,433) had symptoms. Of these, 15,426 (90.4%) had mild symptoms, 910 (5.3%) had moderate symptoms and 97 (0.6%) had severe symptoms. The most common major symptoms among patients were fever (74.3%), dry cough (68.1%), fatigue (42.2%), shortness of breath (29.8%), sore throat (23.5%), and loss of taste and smell (23.2%), and in some cases, productive cough was noted (1.3%). In addition to the main symptoms, patients were noted to have headache (32.7%), nasal discharge (11.9%) and joint pain (9.8%).

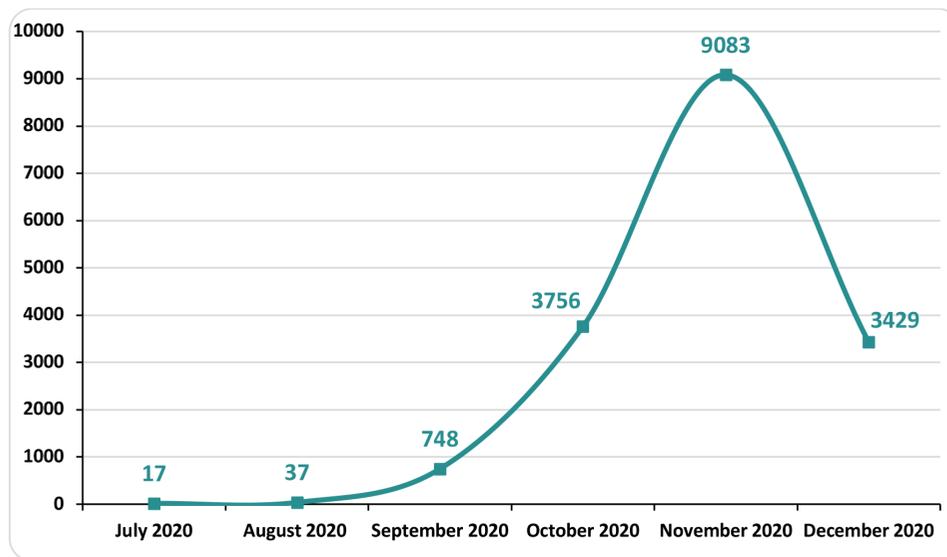
Among those included in the study, hypertension was the most common concomitant disease in 435 cases (2.5%), diabetes in 426 cases (2.5%), and heart disease in 139 cases (0.8%) (Graphic 2).

Assessing the prognosis of those included in the study, 56% (n=9584) patients showed complete recovery, 41.8% (n=7141) recovered, but their symptoms persisted, while 106 females (crude female mortality rate: 1.6%), 239 males (crude male mortality rate: 2.23%) and 345 (2%) patients died due to COVID-19.

In the individuals included in the study, the highest value of positive test results by months was observed in November 2020, and the distribution of positive test results is shown in Graphic 3.



Graphic 2. Distribution of comorbid diseases



Graphic 3. Test result statistics by month

Discussion

17,070 individuals who were not healthcare workers and who were tested and were positive for new coronavirus PCR tests at ACU laboratories between 01/05/2020 and 22/12/2020 were included in the study (Northwest Syria Region). Once the PCR laboratories were opened, the staff at COVID-19 triage points throughout the region were informed. Suspected patients in the triage areas were referred to physicians who tested them for COVID-19. PCR testing was performed on patients the physicians deemed necessary and sent to ACU laboratories. Apart from this, swabs from patients treated in Turkey-supported hospitals were sent to Turkey and examined there; while swabs from patients taken from outpatients, scans and triage areas in the Northwest Syria Region were all examined in ACU laboratories. Because PCR testing at Northwest Syria Region was not performed outside the ACU-operated laboratory, the data are believed to reflect almost all of the COVID-19 PCR-positive patients throughout the region.

WHO data show that the number of cases, which rose gradually and peaked in August, September, October and November in the Eastern Mediterranean, Turkey and Jordan, began to decline in mid-December. The study of Lebanon shows that the number of cases increased moderately in summer and autumn, peaked toward the end of the year and declined in the new year. However, looking at Iraq, Palestine and the Syrian Arab Republic, the data from WHO shows that the number of cases peaked twice in September-October and December-January. In our study conducted in Northwest Syria Region, the number of cases that increased in September, October and November decreased in late November and early December. Our data resemble

the graph corresponding to the case profile of the Eastern Mediterranean, Turkey and Jordan, but differ from that of Iraq, Palestine, Israel, Lebanon and the Syrian Arab Republic (10). This can be explained by the similarity in the reception of asylum seekers in Northwest Syria, which hosts many Syrian immigrants due to internal migration, as well as in Turkey (the highest) and Jordan (the second highest among neighboring countries). However, the fact that the only customs crossing Northwest Syria are through the Turkish border can be cited as a reason why the case numbers show parallelism with Turkey. Additionally, the fact that Turkey supports regional health services as part of humanitarian assistance at the level of health services in its own country and shares its experience in its own health system with local health workers through training and advice can be cited as a reason why the variations in case numbers are similar and reflect the effectiveness of the pandemic response. However, the fact that there is no transition to other countries in the Eastern Mediterranean from the Northwest Syria Region and the different success rates in the fight against COVID-19 can be shown as a reason for the difference from Northwest Syria.

Looking at the literature on COVID-19 infections in relation to gender, a study conducted in Peru found that the rate of infection was 50% higher in men than in women (11). In another study conducted in India, the number of infected males was 5% higher than females (12). In another study conducted in Chile, the infection rate was found to be significantly higher in males than in females (13). In a meta-analysis that examined the whole of Europe from the perspective of developed countries, when the total cases in 40 countries were examined, it was found

that the number of male patients (49.5%) was lower than that of females (50.5%) (14). In our study, the proportion of male patients (62.7%) was significantly higher than the proportion of female patients (37.3%). In assessing the world in general, Carson's letter to the editor on men's health mentions that the rate of disease at COVID-19 is almost the same in both sexes (15). From all these assessments, it appears that the infection rates in underdeveloped and developing countries are higher in men than in women, while this rate is the same or even reversed in developed countries. The reason for this could be that women in underdeveloped countries are less social, participate less in the workforce, live more isolated lives and therefore have less contact.

Evaluation of COVID-19 by the age group shows that there are clusters in the 20-29 and 50-59 age groups in developed countries (14). The age group of 20-49 years has been found to be intense and the age group of 30-39 years has been most affected by the disease among these age groups (9,13). In our study, infectious patients were concentrated in 20-to 49-year-old age group in parallel with developing countries, and the mean age was 37.8 ± 16.4 years. This can be explained by the fact that earlier age groups could not be detected in underdeveloped countries due to the low level of health, literacy and knowledge and low rate of hospitalization and testing in underdeveloped and developing countries.

When searching for the occupational groups of participants in the ACU database, although the occupational group information of the majority could not be obtained, it was found that the most frequently identified occupational groups were civil servants, teachers and students. The reason for the high prevalence of COVID-19 among civil servants, teachers and students could be the fact that they are more aware of COVID-19 than other occupational groups and the number of individuals in these occupational groups is higher than in other occupational groups.

27.1% of PCR samples were tested in Afrin, 50.4% in Idlib and 18.9% in Jarablus laboratories. Idlib is home to approximately 3 million people and the region from Afrin to Jarablus is estimated to have 2 million, with the population density decreasing from west to east (16). However, the conduct of filiation studies with Turkish support in Afrin and Jarablus may have contributed to the lower number of cases and the less positive test results.

In some regional seroprevalence studies conducted in Spain and Italy, the rate of asymptomatic infection was 27-40% (17-19), but 90% of symptomatic patients were uncomplicated and did not require hospitalization because they had only moderate or few symptoms (20). In our study, 3.7% of all participants positive for COVID-19 PCR were asymptomatic and 96.3% were

symptomatic. It was found that 90.4% of participants with symptoms had mild symptoms, 5.3% had moderate symptoms, 0.6% had severe symptoms, and the vast majority (93.7%) did not require hospitalization or isolation. While our study is consistent with data from the literature in terms of hospitalization and symptoms, the low rate of detection of asymptomatic infections can be explained by the fact that screening in the region is not as comprehensive as in developed countries.

In a study conducted in the United States of America, the most common symptoms in patients admitted to the intensive care unit were fever, cough, and shortness of breath (21). Although our study was a social screening, the most common major symptoms in the study were fever (74%), dry cough (68.1%), fatigue (42.2%) and shortness of breath (29.8%). This may suggest that the clinical prognosis does not depend on symptoms alone.

Data from the WHO show that the mortality rate due to COVID-19 worldwide is 2.09%. Looking at these data in the countries with the highest case rates in the world, the mortality rate in the United States is 1.7%, while in India it is 2% and in the United Kingdom it is 2.8%. Among the countries with high mortality rates, the rate is 9% in Mexico. In the countries of Eastern Mediterranean, the average mortality rate is 2.0%, while it is 5.6% in Egypt, 1.3% in Lebanon, 7.0% in the Syrian Arab Republic, and 0.8% in Turkey (10). In our study, the mortality rate was 2%, which is consistent with the average of the Eastern Mediterranean. The fact that the mortality rate in the region is lower than the world average and close to the average of the Eastern Mediterranean can be considered an effect of Turkey's humanitarian services and health standards in the region.

According to a study conducted in Chile, mortality due to COVID-19 was evaluated according to gender and the crude mortality rate was 3.97% for males and 3.09% (13). Considering the data from China, it can be seen that the mortality and hospitalization rates of the male gender are higher than those of the females (20). There are studies from the United States in which male mortality is 1.5 times higher than female mortality (21). In a meta-analysis evaluating 38 countries, it was showed that male mortality is higher in 37 of 38 countries. In our study, in accordance with the literature, the crude mortality rate was found to be higher in males than in females (22).

Study Limitations

COVID-19 diagnoses were evaluated on the basis of the results of PCR test. A limitation of our study is that data from individuals with lung involvement detected by computed tomography were excluded from the digital database.

Conclusion

Our study retrospectively examined the demographic and clinical characteristics of individuals tested and diagnosed with COVID-19 in WHO-supported ACU laboratories in Northwest Syria. Almost all PCR samples in Northwest Syria were tested in ACU laboratories. In this context, we have presented a cross-sectional analysis of almost all individuals with COVID-19 in Northwest Syria for the last 6 months of 2020. Considering the destroyed infrastructure and inadequate settlement, Northwest Syria is considered a vulnerable region in terms of public health. However, the impact of Turkey's humanitarian services in the region and standards of health care, the impact on hospital care and filiation studies can be statistically demonstrated.

Ethics

Ethics Committee Approval: Ethics committee approval for our study was obtained from the Non-Interventional Research Ethics Committee of Mustafa Kemal University of Hatay on 03/12/2020 (meeting number: 01, decision number: 22, date: 14.02.2021).

Informed Consent: Retrospective study.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices - Concept - Design - Data Collection or Processing - Analysis or Interpretation - Literature Search - Writing: B.K., B.Ç.

Conflict of Interest: No conflict of interest was declared by the authors.

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