

RISK FACTORS, COMORBIDITY AND MORTALITY OF COVID-19 PATIENTS AT ISOLATION CENTER IN AL-KHOMIS CITY, LIBYA

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المخلص

الأهداف: تقييم الخصائص الوبائية لمرضى كوفيد 19 وعوامل الخطر بالإضافة الي الامراض المصاحبة للحالات التي تم إيواءها في قسم العزل بمدينة الخمس في ليبيا. المنهجية: دراسة حشدية رجعية تشمل 143 مريضاً لكوفيد 19 و الذين دخلوا لقسم العزل بمدينة الخمس منذ يوم 10 من يوليو سنة 2020 الى يوم 26 نوفمبر لسنة 2020.

النتائج أظهر التحليل الاحصائي لعدد 143 حالة مصابة أن نسبة الذكور تفوق نسبة الإناث بـ 10% و ان معدل الوفيات بين جميع المرضى وصل الى 26.6%. هذه الدراسة أوضحت ان متوسط أعمار المرضى كان 63 سنة في حين كان متوسط أعمار الوفيات 70 سنة. و كانت من أبرز الاعراض المصاحبة للمرضى: الحمى و الوهن العام بالإضافة الى ضيق في التنفس و السعال. وبينت الدراسة أيضاً وجود دلالة و علاقة إحصائية بين معدل تشعب الأكسجين لدى المرضى الذين تم شفاؤهم من المرض بمتوسط في المعدل 82.28% بالمقارنة مع الوفيات حيث كان متوسط معدل تشعب الأكسجين 66.7%. أشارت الدراسة الى وجود أمراض مزمنة مصاحبة للمصابين بنسبة 49% لمرض السكري و 30.1% لمرض ضغط الدم فقط 2.8% لأمراض الجهاز التنفسي ولم تظهر الدراسة أي علاقة أو دلالة إحصائية بين وجود هذه الأمراض و معدل الوفيات أو اعتبارها عوامل خطر لمرضى كوفيد 19.

الخلاصة: بالرغم من أن نسبة المرضى من الرجال كانت أعلى من النساء، لكن جميع المرضى من عمر 63 سنة فما فوق يجب اعتبارهم كشريحة معرضة للخطر في حال وجود اعراض متوسطة لمرض كوفيد 19، كما يجب إجراء المتابعة الطبية الدورية وخاصة من كان معدل تشعب الأكسجين لديهم أقل من 95%، بحيث يلزم التدخل الطبي السريع للحد من ضيق الأكسج و تقليل من مضاعفات المرض الخطيرة أو الوفاة.

ABSTRACT

Objectives: to estimate the epidemiological characteristics, comorbidity and risk factors among patients with Covid-19 symptoms, who were admitted and hospitalized in the isolation center 1 of Covid 19 in Al-khomis city, Libya.

Methods: A retrospective study on 143 patients whom hospitalized in the isolation center of Covid-19 in Al-Khomis city – Libya from the period of July 10, 2020 to November 26, 2020.

Results: The medical data of 143 patients of Covid-19 were subjected to the statistical analysis. The cases of males were more than females by 10%, and mortality rate among all patients was 26.6%. The study showed that the median age of patients was 63 years, while the average age of death was 70 years. The major complains of Covid-19 patients were fever, fatigue, dyspnea, and cough. The results showed that there was a significant difference between Oxygen saturation or SpO2 levels (average 66.7%) of death group compared with Covid-19 survivors (average 82.28%). The comorbidity among the patients included diabetes 49%, hypertension 30.1%, and respiratory diseases only 2.8%. The statistical analysis of the results revealed no significant difference among all of these diseases and the cause of death among the studied cases.

Conclusion: The males are more than females in the infection rate of Covid-19. Patients aged 63 years or older should be considered as risk, and therefor medical follow up is required. Patients who had SpO2 levels less than 95% should have an urgent medical intervention to control the hypoxia and prevent other severe consequences.

Keywords: pandemic, COVID 19, epidemiology, clinical characteristic, comorbidity, mortality, Libya.

1. INTRODUCTION

In December 2019, a novel virus ‘Severe Acute Respiratory Syndrome’ i. e. Coronavirus-2 (SARS-CoV-2) emerged, which caused a new infectious disease called Corona Virus 2019 (COVID-19).¹ The earliest case was reported and isolated in Wuhan, the capital of Hubei province in central China. However, due to its dangerous and highly contagious pattern of spreading, with rapid increase in number of cases across the globe, the World Health Organization (WHO) announced the event of the outbreak of COVID-19 as a pandemic on March 11th, 2020.² Egypt was the first African country to be hit by the COVID-19 on 17th of February, 2020 and confirmed to be the first case in the whole continent.³ Whereas the first case of coronavirus in Libya was reported in Tripoli on 24th of March, 2020.⁴ This virus (SARS-CoV-2) was a new Beta coronavirus that belongs to

Coronaviridae family. The genetic sequence of SARS-CoV-2 shares >80% and 50% sequence identity to previously identified SARS-CoV and MERS-CoV respectively which infects humans, bats and other wild animals.⁵ The phylogenetic network analysis of human SARS-Cov-2 genomes revealed three distinct “variants” to the virus, consisting of clusters of closely related lineages, which they labeled as “A”, “B” and “C”. Type A is the ancestor to all other variants and the most cases of this type were found in United States and Australia. The type B which separated by two mutations from ancestor type A was found among patients in China and other countries of East Asia. Patients in Europe predominantly were diagnosed with type C that showed very little linkage to type B.⁶ In Africa, the genomic analysis showed type B in the majority of African SARS-CoV-2.⁷ This infection causes Covid-19 disease, which can be manifested by different symptoms from mild, moderate and severe illness that may lead to death in some serious cases. Although many cases were asymptomatic, many others showed common symptoms including short of breath, fever, and cough. In addition, other symptoms were reported such as weakness, malaise, respiratory distress, muscle pain, sore throat, loss of taste and/or smell.⁸ Male patients infected with the virus had more severe and moderate symptoms than females. That made them at risk especially elderly patients aged 50 years and older. However, the clinical manifestations could significantly affect the prognosis and the severity of Covid-19.⁹ The risk of death due to the Covid-19 infection could be associated with different comorbidities of patients such as hypertension, diabetes, chronic respiratory disease, cardiovascular disease, and cancer.¹⁰ Due to the lack of an effective treatment of the disease, the best practice and support of the patients remain the hope of better management to resist symptoms especially acute hypoxia respiratory

failure.¹¹ Recently, a lot of companies have produced vaccines with different efficacies like Pfizer/BioNTech (95%5); Gamaleya (92%); Moderna (94.5%); and AstraZeneca (70%).¹²

In Libya, the number of confirmed cases of covid-19 was 82,809 with mortality rate 1.4% of 29th November, 2020 according to National Control Disease Centre (NCDC).¹³ In this study, we report the epidemiological and clinical patterns of 143 patients with COVID-19 disease in Alkhomis isolation center, Libya.

2. MATERIALS AND METHODS

Patients: We conducted a retrospective study on the epidemiological characteristics of 143 patients who were hospitalized in the isolation center of Covid-19 in Alkhomis city – Libya. The clinical data of patients were collected from the period of July 10, 2020 to November 26, 2020. All the cases were diagnosed positive with Covid-19 by the central laboratory of the National Control of Disease Center (NCDC) in Tripoli. All the studied cases suffered from severe symptoms and were admitted to the local isolation center in Alkhomis city. The clinical data of the patients were recorded, they included: symptoms, investigations, and the therapeutic plans.

Statistical analysis: The collected data of Covid-19 patients was analyzed by IBM SPSS statistics software version 20. The statistical analysis was performed using Chi-square. Logistic regression models were used to assess the relationship between variables. Results were considered significant when $P < .05$.

Ethics: All the protocol in this study was approved by the Ethics Commission in the isolation center of Alkhomis. Because of the nature of

collected data, the ongoing public health responds to control the outbreak, as well as the importance of sharing the research findings and bridging the knowledge gaps.

3. RESULTS

The most cases of COVID-19 infection were asymptomatic or mild; however, 143 adult patients were hospitalized with severe conditions in the isolation center of Covid-19 in Alkhomis city. Among the hospitalized cases, 38 patients (26.6%) died, and 105 patients (73.4%) were discharged from the center. The patients were 80(55.9%) males, and 63(44.1%) females. The statistical analysis showed that there was no association between gender and death of patients ($P = .631$). The mean of age of patients was 62.57 years which ranged from 20 to 98 years. Table 1 showed the age distribution of patients. The most cases were from the age group of 55-74 years old (42%), and patients of the age group less than 35 years were only 7 patients (5 %). The statistical analysis revealed that there was a significant difference where $P = .403$ between the average age of patients and the death cases 70years ($SD \pm 14.08$). On the other hand, the average age of the survival patients was 59 years ($SD \pm 15.34$) as showed in table2.

TABLE 1: THE DISTRIBUTIONS OF AGE GROUPS AMONG COVID-19 PATIENTS

Age Group	Number of patients	Percentage %
< 35	7	4.9
35-54	41	28.7
55-74	60	42.0
< 75	35	24.5
Total	143	100.0

TABLE 2: THE STATISTICAL ANALYSIS AND P VALUE OF AGE AND DEATH.

	Value	Df	P value
Pearson Chi-Square	55.899 ^a	54	.403
Likelihood Ratio	67.736	54	.099
Linear-by-Linear Association	12.613	1	.000
N of Valid Cases	143		

The main complains of patients were fever, fatigue, dyspnea and cough. Figure 1 illustrated the most common symptoms in the studied group including dyspnea in 93% of patients, followed by fever (81.8%), fatigue(67.8%), and cough (41.3%).

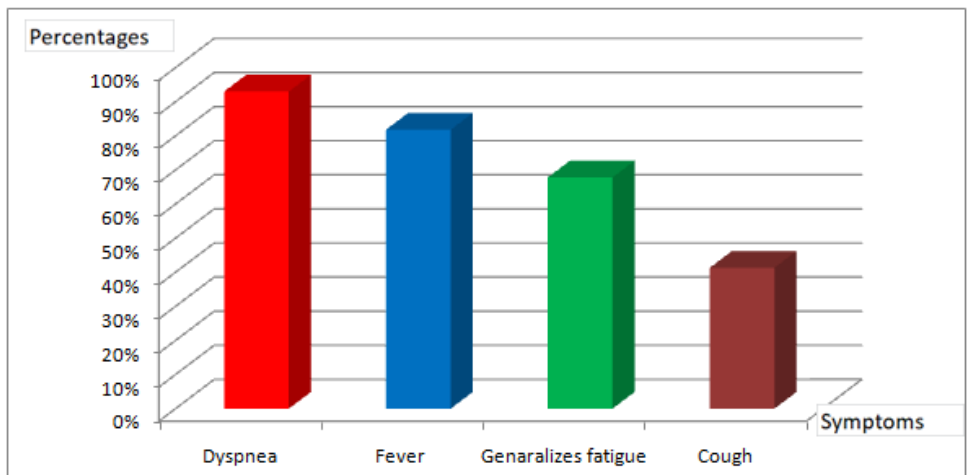


Figure 1: illustrate that the most common symptom with percentages of each symptoms, were percentages correlated to the total number.

The recorded information of the Covid-19 patients showed that the mean of Oxygen saturation or SpO₂ levels were 78% (SD± 15.68) of all patients at admission time. While the Oxygen saturation levels for death cases were 66.76% (SD±16.95) compared with the survival cases which were 82.28% (SD ±7.91).

The comorbidity of the studied Covid-19 patients was varied including diabetes 49%, hypertension 30.1%, and respiratory diseases 2.8%(Figure2). The statistical analysis revealed that there was no significant difference between those diseases and the death of patients($P = .88, .14, \text{ and } .28$) respectively (table3).

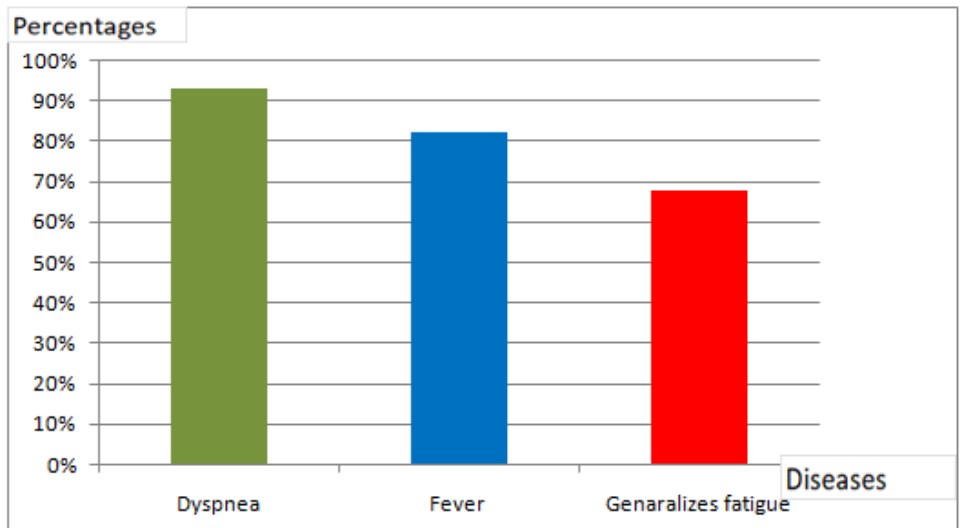


Figure 2: The prevalence of comorbidity among the patients where % correlated to the numbers of patients.

TABLE 3: THE PREVALENCE OF COMORBIDITY AMONG THE PATIENTS AND P VALUE.

The disease	Number of patient	The percentage%	<i>P</i> value
Diabetes	70	49	0.88
Hypertension	43	30.1	0.14
respiratory diseases	4	2.8	0.28

4. DISCUSSION AND CONCLUSION

Our study described the epidemiological and clinical characteristics of Covid-19 of 143 Covid-19 patients whom were admitted to the isolation

center of Covid-19 in Alkhomis city. This study showed that the mortality rate was 26.6% which is similar to the rate recorded by Tanoria et al in Madrid, Spain which was 27%. In addition, the rate of death cases in Northern Italy was 29.7% which was more than our rate by almost 3%.¹⁴

Regarding the role of gender in Covid-19 infection, our data showed that males were more infected than females. This was different from the Hu et al study in China, who found that infected females were 52.1% and males were 47.8%.¹⁵ A study of Islam et al was in agreement with our finding which showed that males were more infected by Covid-19 than females (59.6% and 40.4% respectively).¹⁰ The statistical analysis of our data indicated that there was no association between gender and death cases.

According to the age of the studied Covid-19 patients, the age group of 55-74 years represented 42% of the total patients. The age group of 35-54 years had 28.7% of the patients, while the group aged less than 35 years was 5%. This data indicated that patients older than 55 years were likely at risk to be infected by Covid-19 and admitted to isolation center.

China, Chen et al from Wuhan, China, reported that the median age of mortality due to Covid-19 was 68 years, whereas, the median age of recovered cases was 51 years.¹⁶ Our results showed the average age of mortality was 70 years while the recovered age was 59 years which greater than the mentioned study in China. The study of Onder et al in Italy, revealed that the average age of death cases of Covid-19 was 79.5 years which was 10 to 12 years more than what was reported in China and Libya.¹⁷

The prevalence of the clinical symptoms of 143 Covid-19 patients were dyspnea by 93%, followed by fever 81.8%, fatigue 67.8%, and cough

41.3%. This was in contrast with meta-analysis done by Islam et al of 55 studies in 10014 cases where fever was 81.73%, cough 65.41%, dyspnea 51.50%, and fatigue 38.34% in the severe patients. This disparity is a result of the huge numbers of patients in different countries.¹⁰

Oxygen saturation (SpO₂ level) is a risk factor of death due to Covid-19 patients. The mean of SpO₂ level in dead patients was 66.76% while in the survival patients was 82.28%. This result was in agreement with the study carried out by Mikami et al who classified low SpO₂ level less than 92% as a risk factor in in-patient hospital mortality. The average level of SpO₂ of all patients in the isolation center in Al-Khomis city was low and estimated as 78%. This reflected the status of the admitted Covid-19 patients with severe symptoms of hypoxia.¹⁸

Several studies were conducted in different countries on the epidemiological factors of Covid-19 patients such as gender, age and comorbidity have a potentially important impact on the prognosis of the disease. Fang et al found that the Covid-19 disease severity was associated with hypertension, diabetes, cardiovascular disease, respiratory system disease, and chronic kidney disease.¹⁹ The other meta-analysis study conducted by Bajgain et al estimated hypertension (27.4%), diabetes (17.4%), and respiratory disease(7.5%) in overall covid-19 patients.²⁰ Although those percentages were changed from country to country, it was completely different in our study where diabetes estimated with 49%, hypertension 30.1%, and respiratory diseases 2.8% of all studied patients. Furthermore, the comorbidity associated with Covid-19 was not correlated with the mortality rate of the patients.

5. RECOMMENDATIONS

All Covid-19 patients with SpO₂ level less than 95% should have medical interventions to control the hypoxia and prevent the patients from the severe consequences of the disease. In addition, patients aged 60 years old and up should be included in the program of Corona Virus vaccination regardless the presence of comorbidities. More epidemiological studies on Covid-19 patients should be done in different regions of Libya to evaluate the burden of the disease.

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