# Clinical course and disease outcomes in hospitalized patients with 2019 novel corona virus disease at Ibn- Al Khateeb Hospital in Baghdad, Iraq

Iman A. Mohammed*          FICMS/FM
Abbas H. Ali**             HPD/FM, Family Physician
Jaafer N. Al shenaty**     MRCP

**Abstract:**

**Background:** the novel coronavirus (2019-ncov), formally known as severe acute respiratory syndrome coronavirus 2 (sars-cov-2), the etiological cause of the (corona virus disease 2019) covid-19, appeared in wuhan, hubei province, china. On 11 march 2020, the world health organization (who) declared this disease as a pandemic. As new information on the clinical characteristics, treatment options, and outcomes for covid-19 emerges approximately every hour, physicians should keep themselves up-to-date on this topic.

**Objective:** to study the demographic features, clinical signs and symptoms and certain vital and laboratory findings of covid-19 hospitalized cases; and to identify the used medication, complications, length of stay at the hospital and disease outcomes of confirmed covid-19 cases.

**Patients and methods:** a descriptive cross-sectional study with analytic elements was conducted at ibn-al khateeb hospital, baghdad on covid-19 patients admitted to the hospital from 1st of march to 4th of may 2020. All inpatients of all age groups, diagnosed as covid-19 and had a definite outcome (recovered and discharge or death) during the period of the study were included.

**Results:** the mean age $\pm$ sd for the patients included in the study was = 37.9$\pm$18.85 years, with 51.2% being males. The outcome was statistically significantly associated with age, marital status, hypertension, disease severity at admission and length of stay at hospital.

**Conclusion:** this study found that age was associated with disease outcome. Care, attention and monitoring should be taken into consideration for hypertensive patients. Patients' initial signs and symptoms of dyspnea, weakness and sore throat were significantly associated with disease outcome.

**Key words:** covid-19, rt-pcr, patient outcome .

## Introduction:

Novel coronavirus (2019-nCoV), officially recognized as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the etiological mediator of the (Corona Virus Disease 2019) COVID-19, emerged in Wuhan, Hubei province, China. On 11 March 2020, The World Health Organization (WHO) declared this disease as a pandemic.[1] According to a Chinese study, approximately 80% of patients develop mild disease, and the overall case-fatality rate is around 2.3%.[2] Within two months, the

infection spread rapidly to other countries and regions. Globally, on 5 October 2020, there have been 35,109,317 confirmed cases of COVID-19, including 1,035,341 deaths, reported to WHO.[3] At beginning of the outbreak after China, Italy was the country most influenced by the spreading of COVID-19. Italian epidemiological data updated to 24 March 2020 indicate a very critical situation with a total of 69,176 confirmed infected individuals, 8326 of whom have recovered and 6820 have died.[4] As of 5 October 2020, America is the country most influenced by the spreading of COVID-19 followed by India and Brazil. America epidemiological data indicate a very critical situation with a total of 7,305,270 confirmed infected individuals, 208,064 of whom have died.[3] The difficulties in detecting asymptomatic carriers, who often do not know they are infected, undoubtedly

*\* Training and Human Development Centre, Al-Rusafa Health Directorate .*
*Email: yahyaatheer@gmail.com.*
*\*\* Ibn Al-Kateeb hospital. Email:*
*abbashasanali@gmail.com , jrnr6115@gmail.com.*

facilitates the spread and appearance of unexpected disease foci whose traceability becomes impossible in several cases.5

Corona-viruses are enveloped, non-segmented positive sense RNA viruses whose name is due to projections of club-shaped spikes.6,7 The clinical presentations of the illness vary, but over the course of the disease, most persons with COVID-19 will experience symptoms (fever, dry cough, fatigue, rhinorrhea, myalgia, sore throat, new loss of taste or smell, headache and less frequently diarrhea). The infection will progress, affecting the lower respiratory tract that causes dyspnea, increased respiratory rate, decreased oxygen saturation and finally respiratory failure, septic shock and multi-organ dysfunction.8,9 COVID-19 presents itself after a median incubation time of around 5 days (95% CI, 4.5 to 5.8 days), with a range of 0–24 days and the vast majority (97.5%) of patients being symptomatic within 11.5 days (CI, 8.2 to 15.6 days) from infection.10,11 Initially, the vast majority of patients affected were related to the Wuhan Seafood Market indicating potential exposures to animals and the environment. But soon, spreading from person to person was recorded and became the principal mode of transmission. The infection may be transmitted both asymptomatic and pre-symptomatic patients.12,13

There is currently no COVID-19 vaccine available, and no clear, successful antiviral treatment. While most COVID-19 patients have a mild to moderate course, up to 5-10% may have a serious, potentially life-threatening course. There is an urgent need for effective drugs.14 The vast majority of COVID-19 patients would do well without any treatment, so antiviral treatment is not needed in most cases. However, waiting for patients to get seriously ill before starting therapy may cause us to miss an early treatment window, during which the course of the disease is more modifiable.15,16 As new data about clinical characteristics, treatment options, and outcomes for COVID-19 emerges approximately every hour, physicians who are in the care of patients should keep themselves up to date on this topic. There have been more than 300 clinical trials going on, some of which will be released before the end of 2020. 17Currently, it is strongly recommended that patients be recruited into ongoing trials, which would provide much-needed evidence of the effectiveness and safety of various COVID-19 therapies, since the benefits and harms for most treatments are not yet determined.18

**Objectives:** To identify the demographic features, signs and symptoms and certain vital and laboratory findings among hospitalized COVID-19 cases.
To identify the used medication, complications, length of stay at hospital and outcome of confirmed COVID-19 cases.

**Patients and Methods:**

**Study design and settings:** A descriptive study with an analytic element was conducted at Ibn-Al Khateeb hospital on COVID-19 patients admitted to Ibn Al-Khateeb hospital from 1st of March (first admission of a COVID- 19 case) to 4th of May 2020. This hospital was the only hospital approved to receive COVID-19 patients from other Al-Rusafa hospitals in Baghdad until 4 May 2020. The study enrolled all inpatients treated for COVID-19 and had a definite outcome (death or recovered and discharged) at the early stages of the outbreak.

**Ethical consideration:** The study was authorized by Al-Rusafa Health Directorate Scientific and Ethical Review Committee. Verbal approval was obtained from the hospital administration with a clarification on the purpose of the research before the research was started.

**Definition of cases, inclusion and exclusion criteria:** All the patients of all age groups, diagnosed as COVID-19 admitted to Ibn Al-Khateeb hospital and had a definite outcome during the period of the study were included. COVID-19 cases diagnosis was done according to interim guidelines set by the World Health Organization on 28 January 2020 and 13 March 2020, clinical management of severe acute respiratory infection when novel corona virus (nCOV- 2019) infection is suspected. Specimens were collected from the upper respiratory tract (URT) as nasopharyngeal and oropharyngeal swabs and 2019-nCoV testing was done by RT-PCR 19,20. Cases with incomplete medical records were excluded.

**Data collection procedure:** Out of 129 patients admitted, 127 patients were included in the study while two were excluded. A standardized data collection form was completed based on the **medical records** of the patients. The form was developed by the study team in English. The study questions and the characteristics of the patients were based on the Ministry of Health, Iraq with similar objectives. The form was filled by trained medical staff working at Ibn Al-Khateeb hospital as members of the researcher team. Cases were identified from infectious diseases control center and **medical records;** Patients were not at the hospital at time of data collection (recovered or died). Demographics (age, sex, education level, occupation, marital status and smoking history), signs and symptoms (fever, convulsions, cough, sore throat, dyspnea, vomiting, headache, diarrhea, rhinorrhea, weakness, cyanosis, irritability and others), certain vital and laboratory

investigations (temperature, pulse rare, oxygen saturation), comorbidity (diabetes mellitus, heart disease, hypertension, chronic lung disease, cancer, chronic renal failure and arthritis), case severity classification (mild, moderate, severe or critical)**21**, treatment (hydroxychloroquine, Tamiflu, kaletra, azithromycin, antibiotics, bronchodilators, antipyretics, corticosteroids, immunomodulators, convalescent plasma, mechanical ventilator, oxygen and others), complications (lung fibrosis, heart failure, renal failure and others) and outcome data were collected. **Outcome**: All patients who received treatment completed a planned therapy, the majority received hydroxychloroquine 400mg for the first day then 200 mg twice daily for 5 days, azithromycin 500mg for the first day then 250mg once daily for 5 days, oseltamivir 150 mg for the first day then 75 mg twice daily for 5 days, antipyretic if axillary body temperature ≥37.5oC, other treatment options were added according to physician judgment. The outcome of COVID-19 patients was either recovered / discharged or death. To declare that the patient is recovered, real technique-polymerase chain reaction (RT-PCR) tests results were collected at the end of the treatment, nasopharyngeal and throat specimens were obtained from patients by using specific kits by a qualified health-staff and sent to the Central Public Health Laboratory in Baghdad for RT-PCR testing. The patient was not discharged unless two PCR-tests were negative at least 24 hours apart. According to the WHO interim guidance, 28 January and 13 March 2020, clinical management of severe acute respiratory infection when novel corona virus (nCOV -2019) infection is suspected, repeat samples of URTs should be obtained in hospitalized patients with confirmed 2019-nCoV infection to demonstrate viral clearance. The frequency of specimen selection may depend on local circumstances but should be done at least every 2 - 4 days until there are two negative consecutive results (URT sample) at least 24 hours apart in a clinically recovered patient 19, 20.

**Statistical analysis:** The statistical analysis was performed using statistical package for social science (SPSS-23). Categorical data was formulated as numbers and percentages, normal distribution numerical data were described as means and standard deviations. The Chi-square and fisher's exact probability tests were used, where necessary. A P value of ≤ 0.05 was considered significance.

**Results:**
The sample size was 127 COVID-19 patients. Of them, 23 (18.1%) were at age group 30-39y with mean age ± SD= 37.9±18.85, male patients were 51.2%, while female patients were 48.4%. According to education level and jobs, we included 121 out of 127 because children <6 years old (the age for entering the school in Iraq) were excluded. There was a statistically significant association between age groups and COVID-19 patients' outcome, as 26.3% of those aged 60 and above died. There was no statistically significant association between gender, education level, job, history of smoking and COVID-19 patients' outcome. Out of 116 COVID-19 patients; 74.1% were married as illustrated in table 1. Out of COVID-19 patients 68.5% does not have any comorbidity, 4.6% of them died. There was a no statistically significant association between having comorbidities and COVID-19 patients' outcome except for hypertension. There was no statistical association between COVID-19 patient outcome and using chronic drugs. 6.3% of COVID-19 patients were severely ill patients, 3.9% were critically ill patients, all critical patients died 100%, whereas 74.8% were mild and 15.0% were moderate, none of them died 0.0%. There was a statistically significant association between patient severity status and COVID-19 patients' outcome as illustrated in table 2. Thirty-one (24.4%) of COVID-19 patients in the study had no signs and symptoms, but were contacts of a positive case. They were investigated and when their test result was positive, they were admitted to hospital. Although there was no statistically significant association between having signs and symptoms and COVID-19 patients' outcome, but there was a statistically significant association between those having sore throat, dyspnea, weakness and COVID-19 patients' outcome, as shown in table 3. After two days of starting treatment, all COVID-19 patients that had normal oxygen saturation recovered (100%), whereas all those with low oxygen saturation died (100%). After completing the treatment; all COVID-19 patients that had normal oxygen saturation recovered (100%), whereas all those with low oxygen saturation died (100%). Also, all COVID-19 patients that has high pulse rate died (100%), while all COVID-19 patients (100%) that had normal pulse rate recovered as demonstrated in table 4. Nine patients (7.1%) refused to receive treatment, but they were admitted because at the beginning of the outbreak, any case with COVID-19 whatever its severity (mild, moderate, severe, critical) must be admitted to the hospital for follow up since the numbers of the cases were small then and such measures were possible. Although there has been no statistically significant association between receiving treatment (in general) and outcome, but there was a significant association between those who received kaletra, antibiotics, corticosteroids, anticoagulants,

plasma, other drugs and outcome. There was no statistically significant association between developing complications outcome. The length of stay at hospital was <=7 days for all patients who died, with a statistically significant association between length of stay at hospital and COVID-19 patients' outcome. The overall mean ± SD was 12.18±6.797 days as shown in table 5.

**Table 1: Distribution of COVID-19 hospitalized patients by demographic characteristic and outcome**

| Demographic characteristics | | All Cases | | Recovered | | Died | | P Value |
|---|---|---|---|---|---|---|---|---|
| | | No. | % | No. | % | No. | % | |
| Age group (years) Total (127) Mean ±SD= 37.9±18.85 Median=38 | <30 | 48 | 37.8 | 48 | 100.0 | 0 | 0.0 | 0.030 |
| | 30-39 | 23 | 18.1 | 22 | 95.7 | 1 | 4.3 | |
| | 40-49 | 19 | 15.0 | 18 | 94.7 | 1 | 5.3 | |
| | 50-59 | 18 | 14.2 | 15 | 83.3 | 3 | 16.7 | |
| | 60+ | 19 | 14.9 | 14 | 73.7 | 5 | 26.3 | |
| Gender Total (127) | Male | 65 | 51.2 | 58 | 89.2 | 7 | 10.8 | 0.325 |
| | Female | 62 | 48.8 | 59 | 95.2 | 3 | 4.8 | |
| Education Level Total (121) | None | 35 | 28.9 | 31 | 88.6 | 4 | 11.4 | 0.830 |
| | Primary | 40 | 33.1 | 38 | 95.0 | 2 | 5.0 | |
| | Secondary | 33 | 27.3 | 31 | 93.9 | 2 | 6.1 | |
| | Higher Education | 13 | 10.8 | 11 | 84.6 | 2 | 15.4 | |
| Job Total (121) | Employed | 52 | 43.0 | 47 | 90.4 | 5 | 9.6 | 0.424 |
| | Unemployed | 52 | 43.0 | 48 | 92.3 | 4 | 7.7 | |
| | Retired | 4 | 3.3 | 3 | 75.0 | 1 | 25.0 | |
| | Student | 13 | 10.7 | 13 | 100.0 | 0 | 0.0 | |
| Marital state Total (116) | Married | 86 | 74.1 | 79 | 91.9 | 7 | 8.1 | 0.036 |
| | Unmarried | 20 | 17.2 | 20 | 100.0 | 0 | 0.0 | |
| | Widow / Divorced | 10 | 8.7 | 7 | 70.0 | 3 | 30.0 | |
| Smoker Total (116) | Yes | 16 | 13.8 | 14 | 87.5 | 2 | 12.5 | 0.627 |
| | No | 100 | 86.2 | 92 | 92.0 | 8 | 8.0 | |

**Table 2: Distribution of COVID-19 hospitalized patients by selected clinical characteristic and outcome**

| Comorbidity variables | | All Cases | | Recovered | | Died | | P Value |
|---|---|---|---|---|---|---|---|---|
| | | No. | % | No. | % | No. | % | |
| Case severity at admission | Mild | 95 | 74.8 | 95 | 100.0 | 0 | 0.0 | 0.000 |
| Total (127) | Moderate | 19 | 15.0 | 19 | 100.0 | 0 | 0.0 | |
| | Severe | 8 | 6.3 | 3 | 37.5 | 5 | 62.5 | |
| | Critical | 5 | 3.9 | 0 | 0.0 | 5 | 100.0 | |
| Comorbidity | Yes | 40 | 31.5 | 34 | 85.0 | 6 | 15.0 | 0.071 |
| Total (127) | No | 87 | 68.5 | 83 | 95.4 | 4 | 4.6 | |
| Type of comorbidity | Diabetes | 17 | 34.0 | 14 | 82.4 | 3 | 17.6 | 0.132 |
| Total (51) | Hypertension | 13 | 26.0 | 9 | 69.2 | 4 | 30.8 | 0.010 |
| | Coronary Heart disease | 7 | 14.0 | 6 | 85.7 | 1 | 14.3 | 0.445 |
| | Chronic lung disease | 10 | 20.0 | 10 | 100.0 | 0 | 0.0 | |
| | Chronic renal disease | 1 | 2.0 | 1 | 100.0 | 0 | 0.0 | |
| | Cancer | 1 | 2.0 | 1 | 100.0 | 0 | 0.0 | |
| | Arthritis | 2 | 4.0 | 0 | 0.0 | 2 | 100.0 | |
| Chronic drugs use | Yes | 34 | 26.8 | 30 | 88.2 | 4 | 11.8 | 0.456 |
| | No | 93 | 73.2 | 87 | 93.5 | 6 | 6.5 | |
| Drugs for | Diabetes | 14 | 11.0 | 12 | 85.7 | 2 | 14.3 | 0.303 |
| | Hypertension | 12 | 9.4 | 9 | 75.0 | 3 | 25.0 | 0.053 |
| | Heart disease | 7 | 5.5 | 6 | 85.7 | 1 | 14.3 | 0.445 |
| | Corticosteroids | 9 | 7.1 | 9 | 100.0 | 0 | 0.0 | |
| | Renal failure | 1 | 0.8 | 1 | 100.0 | 0 | 0.0 | |
| | Chemotherapy | 1 | 0.8 | 1 | 100.0 | 0 | 0.0 | |

**Table 3: Distribution of COVID-19 hospitalized patients by signs and symptoms and outcome**

| Signs & symptoms | All Cases | | Recovered | | Died | | P Value |
|---|---|---|---|---|---|---|---|
| Total (127) | No. | % | No. | % | No. | % | |
| Yes | 96 | 75.6 | 87 | 90.6 | 9 | 9.4 | 0.449 |
| No | 31 | 24.4 | 30 | 96.8 | 1 | 3.2 | |
| Fever at presentation | 69 | 54.3 | 62 | 89.9 | 7 | 10.1 | 0.243 |
| Cough | 71 | 55.9 | 64 | 90.1 | 7 | 9.9 | 0.511 |
| Sore throat | 36 | 28.3 | 30 | 83.3 | 6 | 16.7 | 0.030 |
| Dyspnea | 35 | 27.6 | 26 | 74.3 | 9 | 25.7 | 0.000 |
| Weakness | 30 | 23.6 | 22 | 73.3 | 8 | 26.7 | 0.000 |
| Vomiting | 2 | 1.6 | 2 | 100.0 | 0 | 0.0 | - |
| Headache | 14 | 11.0 | 14 | 100.0 | 0 | 0.0 | - |
| Diarrhea | 5 | 3.9 | 5 | 100.0 | 0 | 0.0 | - |
| Rhinorrhea | 15 | 11.8 | 15 | 100.0 | 0 | 0.0 | - |
| Loss of smell | 1 | 0.8 | 1 | 100.0 | 0 | 0.0 | - |
| Cyanosis | 1 | 0.8 | 1 | 100.0 | 0 | 0.0 | - |
| Convulsion | 1 | 0.8 | 1 | 100.0 | 0 | 0.0 | - |
| Irritability | 1 | 0.8 | 1 | 100.0 | 0 | 0.0 | - |
| Chest pain | 1 | 0.8 | 0 | 100.0 | 1 | 10.0 | - |

**Table 4: Distribution of COVID-19 hospitalized patients by selected vital signs and laboratory findings (two days of starting treatment and final) and outcome**

| Certain vital & laboratory findings | | All Cases | | Recovered | | Died | |
|---|---|---|---|---|---|---|---|
| Total (127) | | No. | % | No. | % | No. | % |
| Two days of starting treatment | | | | | | | |
| Temperature | Normal | 89 | 70.1 | 89 | 100.0 | 0 | 0.0 |
| | Fluctuating | 30 | 23.6 | 27 | 90.0 | 3 | 10.0 |
| | High | 8 | 6.3 | 1 | 12.5 | 7 | 87.5 |
| Oxygen saturation | Normal | 109 | 85.8 | 109 | 100.0 | 0 | 0.0 |
| | Fluctuating | 10 | 7.9 | 8 | 80.0 | 2 | 20.0 |
| | Low | 8 | 6.3 | 0 | 0.0 | 8 | 100.0 |
| Pulse rate | Normal | 114 | 89.8 | 114 | 100.0 | 0 | 0.0 |
| | Fluctuating | 6 | 4.7 | 3 | 50.0 | 3 | 50.0 |
| | High | 7 | 5.5 | 0 | 0.0 | 7 | 100.0 |
| ECG | Normal | 122 | 96.1 | 116 | 95.1 | 6 | 4.9 |
| | Abnormal | 5 | 3.9 | 1 | 20.0 | 4 | 80.0 |
| Liver function test | Normal | 126 | 99.2 | 117 | 92.9 | 9 | 7.1 |
| | Abnormal | 1 | 0.8 | 0 | 0.0 | 1 | 100.0 |
| Renal function test | Normal | 126 | 99.2 | 117 | 92.9 | 9 | 7.1 |
| | Abnormal | 1 | 0.8 | 0 | 0.0 | 1 | 100.0 |
| Final / after completing treatment | | | | | | | |
| Temperature | Normal | 115 | 90.6 | 115 | 100.0 | 0 | 0.0 |
| | Fluctuating | 3 | 2.4 | 2 | 66.7 | 1 | 33.3 |
| | High | 9 | 7.1 | 0 | 0.0 | 9 | 100.0 |
| Oxygen saturation | Normal | 115 | 90.6 | 115 | 100.0 | 0 | 0.0 |
| | Fluctuating | 3 | 2.4 | 2 | 66.7 | 1 | 33.3 |

| | | No. | % | No. | % | No. | % |
|---|---|---|---|---|---|---|---|
| | Low | 9 | 7.1 | 0 | 0.0 | 9 | 100.0 |
| Pulse rate | Normal | 115 | 90.6 | 115 | 100.0 | 0 | 0.0 |
| | Fluctuating | 3 | 2.4 | 2 | 66.7 | 1 | 33.3 |
| | High | 9 | 7.1 | 0 | 0.0 | 9 | 100.0 |
| ECG | Normal | 120 | 94.5 | 116 | 96.7 | 4 | 3.3 |
| | Abnormal | 7 | 5.5 | 1 | 14.3 | 6 | 85.7 |
| Liver function test | Normal | 126 | 99.2 | 117 | 92.9 | 9 | 7.1 |
| | Abnormal | 1 | 0.8 | 0 | 0.0 | 1 | 100.0 |
| Renal function test | Normal | 126 | 99.2 | 117 | 92.9 | 9 | 7.1 |
| | Abnormal | 1 | 0.8 | 0 | 0.0 | 1 | 100.0 |

**Table 5: Distribution of COVID-19 hospitalized patients by treatment, complications and outcome**

| Variables | Total | | Recovered | | Died | | P value |
|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | |
| Treatment Total (127) | | | | | | | |
| Yes | 118 | 92.9 | 108 | 91.5 | 10 | 8.5 | 1.000 |
| No | 9 | 7.1 | 9 | 100.0 | 0 | 0.0 | |
| Hydroxychloroquine | 103 | 81.1 | 93 | 90.3 | 10 | 9.7 | 0.206 |
| Tamiflu | 108 | 85.0 | 98 | 90.7 | 10 | 9.3 | 0.357 |
| Kaletra | 7 | 5.5 | 3 | 42.9 | 4 | 57.1 | 0.001 |
| Azithromycin | 109 | 85.5 | 99 | 90.8 | 10 | 9.2 | 0.204 |
| Antibiotic | 30 | 23.6 | 22 | 73.3 | 8 | 26.7 | 0.000 |
| Bronchodilator | 28 | 22.0 | 24 | 85.7 | 4 | 14.3 | 0.151 |
| Antipyretic | 62 | 48.8 | 55 | 88.7 | 7 | 11.3 | 0.199 |
| Corticosteroids | 7 | 5.5 | 4 | 57.1 | 3 | 42.9 | 0.011 |
| Convalescent Plasma | 4 | 3.1 | 2 | 50.0 | 2 | 50.0 | 0.031 |
| Oxygen | 33 | 26.0 | 23 | 69.7 | 10 | 30.3 | 0.000 |
| Mechanical ventilator | 3 | 2.3 | 0 | 0.0 | 3 | 100.0 | - |
| Anticoagulant | 5 | 3.9 | 2 | 40.0 | 3 | 60.0 | 0.003 |
| Other drugs | 4 | 3.1 | 2 | 50.0 | 2 | 50.0 | 0.031 |
| Complications | | | | | | | |
| Total (127) | | | | | | | |
| Yes | 2 | 1.6 | 1 | 50.0 | 1 | 50.0 | 0.152 |
| No | 125 | 98.4 | 116 | 92.8 | 9 | 7.2 | |
| Heart failure | 1 | 0.8 | 0 | 0.0 | 1 | 100.0 | - |
| CVA | 1 | 0.8 | 1 | 100.0 | 0 | 0.0 | - |
| Length of hospital stay (days) | | | | | | | |
| Total (127) Mean ±SD = 12.1 ± 6.80 | | | | | | | |
| <=7 | 34 | 26.8 | 24 | 70.6 | 10 | 29.4 | |
| 8-14 | 61 | 48.0 | 61 | 100.0 | 0 | 0.0 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 15-21 | 16 | 12.6 | 16 | 100.0 | 0 | 0.0 | 0.000 |
| >21 | 16 | 12.6 | 16 | 100.0 | 0 | 0.0 | |

**Discussion:**

COVID-19 is one of the important public health issues that have implications for a significant number of morbidity and mortality. A sample of 127 positive COVID-19 hospitalized cases has been included in our study (117 recovered and discharged and 10 died), case fatality rate in our study=7.87%. As in the Al-Rusafa Health Directorate, we lack epidemiological research on the outcome of COVID-19 and the factors associated with it, our analysis identified in detail the major differences in demographic, clinical characteristics, diagnosis, other vital and laboratory findings and complications among patients who died of COVID-19 and those who recovered from it. We directed this study to identify the present public health problem. In our study the highest proportion of our sample was between 30-39 years (18.1%) with median of 38 years and mean age of 37.9 year. Our median of age is similar to a study done at 3 tertiary hospitals in Wuhan, China (median= 38) 22 and much lower than a study done in Lombardy Region, Italy with a (median =63) 23 and also, lower than a study done on 323 hospitalized patients in china (median=61).24 In our study male percentage was a bit higher than female (51.0% vs 48.8%) which is similar to a study conducted on 107 patients infected with the novel coronavirus, SARS-CoV-2, and discharged from two hospitals in Wuhan, China (male ratio 53.3%).25 But it is lower than a study conducted in America at New York (male ratio 60.3%).26 and lower than a study conducted in a teaching hospital in Italy (male ratio 63%) 27 and also, lower than a study conducted in united states of America (male ratio 75%).28 In our study non-smokers percentage among COVID-19 were more than smokers (86.2%) similar to a study conducted on 323 COVID-19 Hospitalized Patients in Wuhan, China (88.2%)24. In our study; (31.5%) of our COVID-19 cases had comorbidities which is much less than a study done in China on 113 deceased patients with coronavirus disease2019 (49%) 29 and much less than a study conducted in in Lombardy Region, Italy (63%).23 This variation in percentages may be due to that these countries do not follow a healthy life style. There was a significant association between age and COVID-19 patient outcome, most deaths were in older age groups. This is consistent with a study done on 107 infected patients with COVID-19 in china (p value<0.001)25 and another study done also in Wuhan, China (p value<0.0001).30 One of the potential causes for this phenomenon may be that aging is associated with various structural and functional changes in the respiratory tract, resulting in reduced lung capacity, altered pulmonary remodeling, reduced regeneration and increased susceptibility to pulmonary disease 31 Or it may be due to the fact that the elderly are physically weak and have many comorbidities that not only raise the risk of pneumonia, but also affect the prognosis and immune response as new corona virus emerges 32. There was no statistical association between male and female ratio, smoking history and patient outcome, this is inconsistent with a study done in Wuhan, China to detect clinical characteristic of fatal and recovered cases of corona virus 2019 (male: female p value<0.001).33 A study done in Wuhan, China to study the factors related with disease outcome in COVID-19 hospitalized patient (male: female p value=0.517, smoking history p value= 0.018).22 In our study there was a statistically significant association between marital status and COVID-19 patient outcome (p value= 0.002), most married patients recovered and discharged 79 out of 86 (91%), while one divorce which is the only divorce patient admitted with COVID-19 and died (100%), this might be due to that absence of husband may cause emotional depression which affect the immune response of the body to fight the virus. Comorbidities, primarily cardiovascular disorders and chronic lung disorders, have been described as essential to affect mortality in hospitals in critically ill patients.34 In our study, there was no statistically significant association between having comorbidities and patient outcome (p value= 0.071), but there was a significant association between those having hypertension and COVID-19 patients' outcome (p value= 0.010), but no association between having coronary heart disease, diabetes mellitus and COVID-19 outcome. A theory is that the 2019-nCoV virus, which is linked to the ACE (angiotensin converting enzyme) inhibitors used in these patients, has produced more hypertensive patients. ACE inhibitors could indirectly increase the receptors of cell ACE2, which could be the receptors for 2019-nCoV. This is consistent with a study done on adult Wuhan, China (hypertension p value=0.000) 35 and consistent with a study done in Wuhan, China to asses clinical characteristics of fatal and recovered cases of COVID-19 regarding hypertension (p value <0.001) but inconsistent regarding comorbidity (p value<0.001) and heart disease (p value=0.031). 33

Inconsistent with a study done in United States (hypertension p value=0.31). 28  In our study there was no statistically significant association between patients using chronic drugs such as antidiabetic, heart disease drugs and antihypertensive drugs in COVID-19 patient outcome (p value= 0.303, 0.445 and 0.053 respectively). This is inconsistent with a study done in china to assess if metformin was associated with mortality in diseased hospitalized patients with COVID-19, the in-hospital mortality of 2.9% (3/104) in the metformin group was markedly decreased compared with the mortality of 12.3% (22/179) in the no-metformin group (p value= 0.01). 36 As differences in factors influencing outcomes have been observed among global populations, we hypothesize that factors such as pollution, social economic variables, genetics, population co-morbidities, and availability of health status and infrastructure can all impact the COVID-19 morbidity and mortality observed across different regions. It is necessary to understand differences between the patient characteristics across different regions in order to enable better clinical awareness and allocation of medical resources. Incidence of symptoms including fever, convulsions, cough, vomiting, headache, diarrhea, rhinorrhea, cyanosis, irritability and smell loss did not vary substantially between patients who died and recovered, while sore throat, dyspnea, and fatigue were more common among those who died (p value = 0.030, 0.000, 0.000, respectively). It is easy to understand that in pulmonary disease, dyspnea also means poor prognosis and the criterion for determining COVID-19 severity. Furthermore, the vital signs data showed that most of the deceased patients had tachycardia and/or tachypnoea as well as initial saturation of blood oxygen in the death group was lower than in the recovered group. Such signs and symptoms suggested that the majority of the deceased were in serious or critical condition upon admission, and the onset of such symptoms could help physicians recognize patients at risk of poor outcome, so it is easy to understand that progressive hypoxemia also indicates poor prognosis in pulmonary diseases, so hypoxemia measures are already used to evaluate COVID-19 severity.37 Our results were consistent with a study done on adult, Wuhan (dyspnea p value=0.000 and fever p value=1.000). 35 A study done in the United States confirmed that there is no risk in having any sign and symptoms and in COVID-19 patient outcome.28 In assessing patient severity status at admission, most of the recovered patients were in mild state at admission 81.2%, while all patients in the

"death" group were admitted to hospital in a severe or critical state which may lead to poor prognosis, this makes a significant difference between patient severity status and outcome (p value=0.000). This difference possibly caused by rapid progression of COVID-19 in severe and critical cases to death. In our study, using treatment does not make a statistically significant difference in COVID-19 patient outcome (P value=1.000), except for some treatment options such as Kaletra, antibiotics, corticosteroids, anticoagulant and plasma (p value=0.001, 0.000, 0.011, 0.003 and 0.031 respectively). Regarding treatment protocol, our study results were consistent with a study done in Wuhan, China to identify factors related with disease outcome in COVID-19 hospitalized patient (treatment protocol p value=0.371) but inconsistent with the using of glucocorticoids (p value= 0.075) 22 and consistent with a study done on 323 COVID-19 patients (Kaletra p value<0.001 and glucocorticoids p value<0.001). 24 Also inconsistent with a study done in United States (hydroxychloroquine p value=0.02, azithromycin p value=0.04 and steroids p value=0.2). 28 One drawback of our study is that a limited sample size and the two groups varied in their initial conditions. Thus, these findings do not include definitive evidence on the efficacy of the various treatments. More work is needed on the need to use antibiotics prophylactically, and the time to use them in patients with viral pneumonia. Previous research of corticosteroid therapy show that high doses of corticosteroids do not decrease SARS mortality but appear to cause severe adverse reactions.38  Further studies are required to examine the importance, dosage, and timing of corticosteroid therapy in infection with nCOV in 2019.  Length of stay at hospital differs significantly between recovered and died groups, all patients in died group had a length of stay at hospital <=7 days, this might be due to that all patients in this group arrived to hospital at severe or critical state, where no beneficial from any interventions and end in poor prognosis and death. This is consistent with a study done in United States (p value=0.03), 28 and a study done in Wuhan, China to assess clinical characteristics of fatal and recovered cases of COVID-19 (Length of stay p value<0.001), 33 but inconsistent with a study done on 107 patients infected with COVID-19 in Wuhan, China (length of stay p value= 0.561). 25 The mortality rate is estimated only for patients who have been discharged alive or died by the end point of the study. At the research conclusion, many patients were already in the hospital. We expect that recorded mortality rates

will decrease as these patients complete their stay in hospital. Our analysis was performed in a single-center hospital. Therefore, a large-scale multicenter study with additional researchers is required. Currently the correct COVID-19 diagnosis and treatment methods are still under review. Early detection and adaptive monitoring of prognostic factors are important if COVID-19 is to be handled more effectively.

**Conclusions:**
This research found a significant association of disease outcome with age. Old patients need to be closely supervised and treated to reduce their mortality by taking appropriate medical therapy. Also, a special care, attention and monitoring should be taken inconsideration to hypertensive patients, and to patients' initial signs and symptoms including dyspnea, weakness and sore throat because they were significantly associated with disease outcome. Patients who admitted to the hospital at severe or critical state with poor vital and laboratory findings should be followed continuously.

**Authors'contributions:**
Study conception, design, data analysis, data interpretation, drafting manuscript, critical revision by Dr. Iman Ahmed Mohammed.
Data collection by Dr.Abbas Hasan Ali and Dr. Jaafer Naseer Al shenaty.

**References:**
*1. The opening remarks by the Director-General of the WHO at COVID-19 media briefing: 11 March 2020. Released 11 March 2020. 30 March 2020 Accessed. https:/www.who.int/dg/speeches/detail/ who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19--11-march-2020.*
*2. Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: summary of a report of 72 314 cases from the Chinese Center for Disease Control and Prevention. JAMA. 2020 Feb 24. doi: 10.1001/jama.2020.2648.*
*3. World health organization (2020). WHO Coronavirus Disease (COVID-19) Dashboard. https://covid19.who.int/table*
*4. Mungroo MR, Khan NA, Siddiqui R. Novel Coronavirus: Current Understanding of Clinical Features, Diagnosis, Pathogenesis, and Treatment Options. Pathogens (Basel, Switzerland). 2020 Apr;9(4).*

*5. Li R., Pei S., Chen B., Song Y., Zhang T., Yang W., et al. Substantial undocumented infection facilitates the rapid dissemination of novel coronavirus (SARS-CoV2) Science. 2020:1–9.*
*6. Zhou P, Yang XL, Wang XG, Hu B, Zhang L, Zhang W, et al. A pneumonia outbreak associated with a new coronavirus of probable bat origin. Nature. 2020;579(7798):270–3.*
*7. Letko M, Marzi A, Munster V. Functional assessment of cell entry and receptor usage for SARS-CoV-2 and other lineage B beta coronaviruses. Nat Microbiol. 2020. https://doi.org/10.1038/s41564-020-0688-y.*
*8. World Health Organization (2020). Q&A on coronaviruses (COVID-19) https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-coronaviruses.*
*9. Center for Disease Control and Prevention. Interim Clinical Guidance for Management of Patients with Confirmed Coronavirus Disease (COVID-19) https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-guidance-management-atients.html*
*10. Guan WJ, Ni ZY, Hu Y, Liang WH, Ou CQ, He JX, et al. Clinical characteristics of coronavirus disease 2019 in China. N Engl J Med. 2020. https://doi.org/10. 1056/NEJMoa2002032.*
*11. Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, et al. Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. N Engl J Med. 2020. https://doi.org/10.1056/NEJMoa2001316.*
*12. Chan JF, Yuan S, Kok KH, To KK, Chu H, Yang J, et al. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating personto-person transmission: a study of a family cluster. Lancet. 2020;395(10223): 514–23.*
*13. Rothe C, Schunk M, Sothmann P, Bretzel G, Froeschl G, Wallrauch C, et al. Transmission of 2019-nCoV infection from an asymptomatic contact in Germany. N Engl J Med. 2020;382(10):970–1. G.*
*14. Hoffmann C. Treatment. In: Kamps BS, Hoffmann C, eds. Covid Reference, Edition 2020-2. SteinHauser Verlag; Amedeo, Germany; 2020. Website www.covidreference.com [accessed 12 April 2020].*
*15. Uyeki TM, Bernstein HH, Bradley JS, Englund JA, File TM, Fry AM, et al. Clinical practice guidelines by the infectious diseases society of America: 2018 update on diagnosis, treatment, chemoprophylaxis, and institutional outbreak management of seasonal influenza. Clinical Infectious Diseases 2019; 68: e1. doi: 10.1093/cid/ciy866.*

16. *Chan KS. Treatment of severe acute respiratory syndrome with lopinavir/ritonavir: a multicenter retrospective matched cohort study. Hong Kong Medical Journal 2003; 9: 399-406.*

17. *World Health Organization (2020). "Solidarity" clinical trial for COVID-19 treatments [online]. Website https://www.who.int/ emergencies/diseases/novel-coronavirus-2019/global-research-on-novel-coronavirus-2019-ncov/solidarity-clinical-trial-for-covid-19treatments [accessed 12 April 2020].*

18. *Bhimraj A, Morgan RL, Shumaker AH, Lavergne V, Baden L, Cheng VC, et al. Infectious Diseases Society of America Guidelines on the Treatment and Management of Patients with COVID-19 Infection [online]. Website https://www.idsociety.org/globalassets/idsa/ practice-guidelines/covid-19/treatment/idsa-covid-19-gl-tx-and-mgmt-4-11-20-1058-am-edt.pdf [accessed 12 April 2020].*

19. *World Health Organization interim guidance 28 January 2020, clinical management of severe acute respiratory infection when novel corona virus (nCOV -2019) infection is suspected. https://apps.who.int/iris/handle/10665/330893.*

20. *World Health Organization interim guidance 13 March 2020, clinical management of severe acute respiratory infection when novel corona virus (nCOV -2019) infection is suspected. https://apps.who.int/iris/handle/10665/331446.*

21. *World Health Organization. (2020). Clinical management of COVID-19: interim guidance, 27 May 2020. World Health Organization. https://apps.who.int/iris/handle/10665/332196*

22. *Liu W, Tao ZW, Wang L, Yuan ML, Liu K, Zhou L, et al. Analysis of factors associated with disease outcomes in hospitalized patients with 2019 novel coronavirus disease. Chin Med J (Engl). 2020;133(9):1032-1038.*

23. *Grasselli G, Zangrillo A, Zanella A, Antonelli M, Cabrini L, Castelli A, et al. Baseline Characteristics and Outcomes of 1591 Patients Infected With SARS-CoV-2 Admitted to ICUs of the Lombardy Region, Italy [published online ahead of print, 2020 Apr 6]. JAMA. 2020;323(16):1574-1581. doi:10.1001/jama.2020.5394.*

24. *Hu L, Chen S, Fu Y, Gao Z, Long H, Wang JM, et al. Risk Factors Associated with Clinical Outcomes in 323 COVID-19 Hospitalized Patients in Wuhan, China. Clin Infect Dis. 2020 May 3: ciaa539. doi: 10.1093/cid/ciaa539. Epub ahead of print. PMID: 32361738; PMCID: PMC7197620. et al. Risk Factors Associated with Clinical Outcomes in 323 COVID-19 Hospitalized Patients in Wuhan, China, Clinical Infectious Diseases, ciaa539, https://doi.org/10.1093/cid/ciaa539.*

25. *Wang D, Yin Y, Hu C, Liu X, Zhang X, Zhou S, et al. Clinical course and outcome of 107 patients infected with the novel coronavirus, SARS-CoV-2, discharged from two hospitals in Wuhan, China. Crit Care. 2020;24(1):188. Published 2020 Apr 30. doi:10.1186/s13054-020-02895-6.*

26. *Richardson S, Hirsch JS, Narasimhan M, Crawford JM, McGinn T, Davidson KW, et al. Presenting Characteristics, Comorbidities, and Outcomes Among 5700 Patients Hospitalized With COVID-19 in the New York City Area. JAMA. 2020;323(20):2052–2059. doi:10.1001/jama.2020.6775.*

27. *Colaneri M, Sacchi P, Zuccaro V, Biscarini S, Sachs M, Roda S, et al. Clinical characteristics of coronavirus disease (COVID-19) early findings from a teaching hospital in Pavia, North Italy, 21 to 28 February 2020. Euro Surveill. 2020;25(16): pii=2000460.*

28. *Aggarwal S, Garcia-Telles N, Aggarwal G, Lavie C, Lippi G, & Henry B. (2020). Clinical features, laboratory characteristics, and outcomes of patients hospitalized with coronavirus disease 2019 (COVID-19): Early report from the United States, Diagnosis, 7(2), 91-96. doi: https://doi.org/10.1515/dx-2020-0046.*

29. *Chen T, Wu D, Chen H, Yan W, Yang D, Chen G, et al. Clinical characteristics of 113 deceased patients with coronavirus disease 2019: retrospective study BMJ 2020; 368: m1091.*

30. *Zhou F, Yu T, Du R, Fan G, Liu Y, Liu Z, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study [published correction appears in Lancet. 2020 Mar 28;395(10229):1038] [published correction appears in Lancet. 2020 Mar 28;395(10229):1038]. Lancet.2020;395(10229):1054-1062. doi:10.1016/S0140-6736(20)30566-3.*

31. *Cho SJ, Stout-Delgado HW. Aging and lung disease. Annu Rev Physiol 2020; 82:433–459. doi: 10.1146/annurev-physiol-021119-034610.*

32. *Cilloniz C, Polverino E, Ewig S, Aliberti S, Gabarrus A, Menendez R, et al. Impact of age and comorbidity on cause and outcome in community-acquired pneumonia. Chest 2013; 144:999–1007. doi: 10.1378/chest.13-0062.*

33. Deng Y, Liu W, Liu K, Fang YY, Shang J, Zhou L, et al. Clinical characteristics of fatal and recovered cases of coronavirus disease 2019 in Wuhan, China: a retrospective study. Chin Med J (Engl). 2020;133(11):1261-1267.

34. Adha KS, Zhao K, Quraishi SA, Kurth T, Eikermann M, Kaafarani HM, et al. The Deyo-Charlson and Elixhauser-van Walraven comorbidity indices as predictors of mortality in critically ill patients. BMJ Open 2015; 5: e008990doi: 10.1136/bmjopen-2015-008990.

35. Li X, Xu S, Yu M, Wang K, Tao Y, Zhou Y, et al. Risk factors for severity and mortality in adult COVID-19 inpatients in Wuhan [published online ahead of print, 2020 Apr 12]. J Allergy Clin Immunol. 2020; S0091-6749(20)30495-4. doi: 10.1016/j.jaci.2020.04.006.

36. Luo P, Qiu L, Liu Y, Liu XL, Zheng JL, Xue HY, et al. Metformin Treatment Was Associated with Decreased Mortality in COVID-19 Patients with Diabetes in a Retrospective Analysis [published online ahead of print, 2020 May 21]. Am J Trop Med Hyg. 2020;10.4269/ajtmh.20-0375. doi:10.4269/ajtmh.20-0375.

37. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet 2020; 395:497–506. doi: 10.1016/S0140-6736(20)30183-5.

38. Levy MM, Baylor MS, Bernard GR, Fowler R, Franks TJ, Hayden FG, et al. Clinical issues and research in respiratory failure from severe acute respiratory syndrome. Am J Respir Crit Care Med 2005; 171:518-526. doi: 10.1164/rccm.200405-621WS.

**المسار السريري ونتائج المرض في المرضى المصابين بمرض فيروس كورونا المستجد 2019 في مستشفى ابن الخطيب في بغداد، العراق**

د. ايمان احمد محمد

د.عباس حسن علي

د.جعفر ناصر الشيناتي

**الخلاصة:**

**خلفية البحث:** ظهرت الفيروسات التاجية الجديدة المعروفة باسم المتلازمة التنفسية الحادة الوخيمة 2، العامل المسبب لمرض فيروس كورونا المستجد، في ووهان، الصين. في 11 مارس 2020، أعلنت منظمة الصحة العالمية هذا المرض بأنه جائحة. نظرًا لظهور بيانات جديدة حول الخصائص السريرية وخيارات العلاج ونتائج فيروس كورونا المستجد 2019 كل ساعة تقريبًا، يجب على الأطباء مواكبة التطورات في هذا الموضوع.

**الاهداف:** التعرف على المسار السريري والعوامل الديموغرافية لمرضى فيروس كورونا المستجد 2019وتاثيرها على نتيجة المرض للمصابين بمرض فيروس كورونا المستجد 2019 في مستشفى ابن الخطيب في بغداد، العراق.

**المرضى والمنهجية:** اجريت دراسة وصفية مع عناصر تحليلية لمرضى فيروس كورونا المستجد الذين تم إدخالهم إلى مستشفى ابن الخطيب في الفترة من 1 ابريل حتى 4 نيسان 2020 وكان لديهم نتائج محددة. تم تضمين جميع المرضى الداخليين من جميع الفئات العمرية، الذين تم تشخيصهم على أنهم مصابون بفيروس كورونا امستجد 2019 وكان لديهم نتيجة مؤكدة (شُفوا وأخرجوا أو توفوا).

**النتائج:** متوسط العمرمع معدل الانحراف18.851 ± 37.9 سنة، كانت نسبة الذكور من المصابين 51.2%, كانت نتيجة فيروس كورونا المستجد مرتبطة بشكل ثابت مع العمر والحالة الزوجية والمرضى المصابين بارتفاع ضغط الدم وطول فترة البقاء بالمستشفى و شدة حالة المريض.

**الاستنتاجات:** اثبتت الدراسة أن العمر له علاقة وثيقة مع نتائج المرض. يجب الانتباه والمراقبة مع مراعاة لمرضى ارتفاع ضغط الدم، العلامات الأولية للمرضى وأعراض ضيق التنفس والضعف والتهاب الحلق لأنها مرتبطة بشكل كبير بنتائج المرض

**مفتاح الكلمات:** فيروس كورونا المستجد، تقنية تفاعل البلمرة المتسلسل بتقنية حقيقية، نتيجة المريض .