# CLINICAL AND EPIDEMIOLOGICAL FEATURES OF 210 COVID-19 PATIENTS IN BABYLON GOVERNORATE DURING 2020

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| Article history: | | Abstract: |
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| | | Coronavirus infection has become a major public health concern. Many studies have reported the clinical and epidemiological features of Coronavirus Disease 2019 (COVID-19), but the data remained inconsistent. This study aimed to study more available data to provide clearer picture to understand the characteristics of coronavirus patients. A total of 210 confirmed Covid-19 patients were included in this study. Data were collected during March 25th to June 24th and the impact of age, comorbidities, gender, contact, travel history, job title, contacts, on the dynamic profile of signs and symptoms in Covid-19 patients were investigated. Results showed that the patients in the age range of <10 - 29 years were mostly asymptomatic. Mild and severe symptoms were the most common in patients aged from 29 to 59 years. (10.63%) of patients aged from 60 to 69 years were asymptomatic and (5.66%), (2.70%), (3.84%) of patients were falling with the simple, mild symptoms, and sever symptoms respectively. Additionally, results showed that there was a significant difference between patients without comorbidities and the severity of COVID-19 infection. Also, there was a substantial association (p < 0.000) between individuals' contacting confirmed COVID-19 patients and the incidence of infections. In summary, the clinical and epidemiological features of Covid-19 patients were non-specific and heterogeneous. The information provided in this study important for understanding the impact of Covid-19. |

## INTRODUCTION

Coronaviruses are positive stranded RNA viruses with a genome of 30 kb encased in a protein envelope. In the last two decades, two shocking coronavirus illness outbreaks have occurred. The Severe Acute Respiratory Syndrome (SARS) in 2003[1] and the Middle East respiratory syndrome (MERS) in 2012 [2]. The Severe Acute Respiratory Syndrome (SARS) has been identified as the main cause of severe pneumonia cases in Wuhan, Hubei Province, China [3]. This disease was termed as Coronavirus Disease (Covid-19) by the World Health Organization (WHO). It has been reported that Covid-19 causes a possible to

the lung, liver, heart, and kidney. Therefore, infections with Covid-19 are at a significant risk to patients due to the prevalence of pneumonia [4]. SARS had cased 44067 confirmed cases of Covid-19 by March 1, 2020 in 117 countries, and 80981 cases in China [5]. In recent, asymptomatic coronavirus infected patients were identified as the possible source of transmission, therefore, the diagnoses and isolation of the virus was the major concern for successfully containing the viral pandemic [6, 7]. Elderly people and those underlying medical disorder including diabetes and hypertension are more likely to get sever Covid-19 infections. It has been shown that patients with diabetes are at higher

rate of morbidity and mortality and they are more likely to be hospitalized and admitted to the intensive health care unit (ICU) [8]. However, it has been shown that men are more susceptible to Covid-19 infection than women and also having a higher mortality rate. It had been shown that [9]. A study in South Korea showed that men mortality rate was nearly double than women [10]. In this study, we investigated the impact of age, comorbidities, gender, contact, travel history, job title, contacts, on the dynamic profile of signs and symptoms in Covid-19 patients.

## METHODOLOGY
### Study design
A total of 210 confirmed Covid-19 patients were included in this study. Data from the patients were collected from the Public Health Laboratory, Babylon Health Department in Iraq during March 25th to June 24th. All enrolled patients were diagnosed with COVID-19 according to the diagnosis and treatment guideline for Covid-19 from the Iraqi Ministry of Health and according to the guideline of the Center for Disease Control and Prevention (CDC). All data (test dates and results of RT-PCR assay) were collected up to the final follow-up date (June 24th, 2020).

### Data collections and definitions
Throat and/or nasal swabs were obtained at different times to detect the corona viral nucleic acid using the real-time reverse-transcription polymerase-chain-reaction (RT-PCR) assay. The electronic medical record system was used to collect the data (clinical information, and RT-PCR results for corona viral nucleic acid detection). The following information was collected for analysis based on the following parameters: 1. Demographic characteristics such as age, gender, occupation. 2. Clinical characteristics such as comorbidities, symptoms, and date of onset

(defined as the first date when the results were confirmed by RT-PCR), date of hospitalization, and date of discharge. 3. Coronavirus characteristics. 4. Contact and travel history.

### Statistical analysis
Statistical analysis of 210 Covid-19 patients was conducted using the SPSS software version 10.0 (IBM, NY, USA). We presented categorical variables as number (%). Data were analyzed by Pearson's Chi-squared test (P < 0.05).

## RESULTS
We investigated the impact of age, comorbidities, gender, contact, travel history, job title, contacts, on the dynamic profile of signs and symptoms in Covid-19 patients and the results were as follow:

### Age
As indicated in Table 1, the patients in the age range of <10 - 29 years were mostly asymptomatic. For patients with age <10 years, (8.10%) of them had mild symptoms, followed by simple symptoms (7.54%). While we observed that severe symptoms are uncommon in this age group and this results were similar to patients aged from 20 to 29 years. However, among patients aged from 10-19 years, severe symptoms were more common, as the second-highest percent followed by being asymptomatic. For middle-aged patients aged from 29 to 59 years, mild and severe symptoms were the most common. The percentages for older people aged from 60 to 69 years, (10.63%) of them were Asymptomatic, (5.66%), (2.70%), (3.84%) were simple symptoms, mild symptoms, and sever symptoms respectively. Asymptomatic patients who fall in the 70-79 age range had the least percentage, whereas severe symptoms were highly typical for 80-89 years old of Covid-19 patients.

**Table 1.** Characteristics of Covid-19 patients (Age based).

| Age (interval) | Signs and symptoms | | | | |
|---|---|---|---|---|---|
| | Asymptomatic | Simple symptoms | Mild symptoms | Sever symptoms | Total |
| <10 | 13 (13.82%) | 4 (7.54%) | 3 (8.10%) | 1 (3.84%) | 21 (10%) |
| 10-19 | 8 (8.51%) | 1 (1.88%) | 1 (2.70%) | 2 (7.69%) | 12 (5.71%) |
| 20-29 | 31 (32.97%) | 12 (22.64%) | 7 (18.91%) | 3 (11.53%) | 53 (25.23%) |
| 30-29 | 14 (14.89%) | 17 (32.07%) | 13 (35.13%) | 7 (26.92%) | 51 (24.28%) |
| 40-49 | 9 (9.57%) | 8 (15.09%) | 4 (10.81%) | 5 (19.23%) | 26 (12.38) |
| 50-59 | 7 (7.44%) | 5 (9.43%) | 4 (10.81%) | 5 (19.23%) | 21 (10%) |
| 60-69 | 10 (10.63%) | 2 (3.77%) | 4 (10.81%) | 1 (3.84%) | 17 (8.09%) |
| 70-79 | 2 (2.12%) | 3 (5.66%) | 1 (2.70%) | 1 (3.84%) | 7 (3.33%) |
| 80-89 | 0 (0%) | 1 (1.88) | 0 (0%) | 1 (3.84%) | 2 (0.95%) |
| Total | 94 (44.76%) | 53 (25.23%) | 37 (17.61%) | 26 (12.38%) | 210 |

## Comorbidities

Results showed that there was a significant difference between patients without comorbidities and the severity of COVID-19 infection. The majority of clear history patients were asymptomatic (93.61%), followed by simple and mild symptoms. Sever symptoms were less common. Patients with pre-existing medical conditions, on the other hand, were distinguished by their severe symptoms, but without any significant differences (Table 2).

**Table 2.** Characteristics of Covid-19 patients (Comorbidities based).

| Comorbidities | Signs and symptoms | | | | |
| | Asymptomatic | Simple symptoms | Mild symptoms | Sever symptoms | Total |
|---|---|---|---|---|---|
| None | 88 (93.61%) | 45 (84.90%) | 32 (86.48%) | 19 (73.07%) | 184 (87.61%) |
| Diabetes | 1 (1.06%) | 2 (3.77%) | 0 (0%) | 3 (11.53%) | 6 (2.85%) |
| Hypertension | 1 (1.06%) | 2 (3.77%) | 2 (5.40%) | 0 (0%) | 5 (2.38%) |
| Hypertension+Diabetes | 1 (1.06%) | 0 (0%) | 1 (2.70%) | 2 (7.69%) | 4 (1.90%) |
| Chronic lung disaese | 0 (0%) | 1 (1.88%) | 0 (0%) | 1 (3.84%) | 2 (0.95%) |
| Hypertension+diabetes+cardiovascular disease | 0 (0%) | 2 (3.77%) | 1 (2.70%) | 0 (0%) | 3 (1.42%) |
| parkinson's disease | 0 (0%) | 0 (0%) | 1 (2.70%) | 0 (0%) | 1 (0.47%) |
| diabetes+kidny disease | 0 (0%) | 1 (1.88%) | 0 (0%) | 0 (0%) | 1 (0.47%) |
| Hypertension+breast cancer+radiotherpy | 0 (0%) | 0 (0%) | 0 (0%) | 1 (3.84%) | 1 (0.47%) |
| Cardiovascular disease | 1 (1.06%) | 0 (0%) | 0 (0%) | 0 (0%) | 1 (0.47%) |
| Hypertension+diabetes+cardiovascular disease+cancer | 1 (1.06%) | 0 (0%) | 0 (0%) | 0 (0%) | 1 (0.47%) |
| Aautoimmunodisease | 1 (1.06%) | 0 (0%) | 0 (0%) | 0 (0%) | 1 (0.47%) |
| Total | 94 (44.76%) | 53 (25.23%) | 37 (17.61%) | 26 (12.38%) | 210 |

## Gender

In this study, we determined that there were no significant differences in terms of infection incidence between male and female. For male, patients with a simple symptoms and sever symptoms were nearly having a similar percentages (69.81%), (65.38%) respectively. While (54.05%) of patients were experienced mild symptoms, and (55.31%) were asymptomatic. For female, patients with asymptomatic, simple symptoms, mild symptoms, and severe symptoms were (44.68 %), (30.18 %), (45.94 %), and (34.61 %) respectively (Table 3).

**Table 3.** Characteristics of Covid-19 patients (Gender based).

| Gender | Signs and symptoms | | | | |
| | Asymptomatic | Simple symptoms | Mild symptoms | Sever symptoms | Total |
|---|---|---|---|---|---|
| male | 52 (55.31%) | 37 (69.81%) | 20 (54.05%) | 17 (65.38%) | 126 (60%) |
| female | 42 (44.68%) | 16 (30.18%) | 17 (45.94%) | 9 (34.61%) | 84 (40%) |
| Total | 94 (44.76%) | 53 (25.23%) | 37 (17.61%) | 26 (12.38%) | 210 |

## Contact

Results showed that there was a substantial association (p < 0.000) between individuals' contacting confirmed COVID-19 patients and the incidence of infection, but there was no correlation with the severity of the infection. The vast majority of contacts (87.23%) had no symptoms. Simple and mild symptoms had similar percentages (54.71%), (54.05%) respectively. Severe symptoms were the least common. In contrast, severe symptoms were the

most common in the remaining patients (57.96%) who were not in contact with (COVID-19) patients, while asymptomatic were less common (Table 4).

**Table 4.** Characteristics of Covid-19 patients (Contact based).

| Contact | Signs and symptoms | | | | |
|---|---|---|---|---|---|
| | Asymptomatic | Simple symptoms | Mild symptoms | Sever symptoms | Total |
| YES | 82 (87.23%) | 29 (54.71%) | 20 (54.05%) | 11 (42.30%) | 142 (67.61%) |
| NO | 12 (12.76%) | 24 (45.28%) | 17 (45.94%) | 15 (57.96%) | 68 (32.38%) |
| Total | 94 (44.76%) | 53 (25.23%) | 37 (17.61%) | 26 (12.38%) | 210 |

**Travel history**
(95.71%) of the patients had not been abroad, and the severity of the disease among those patients were nearly similar. Patients with active travel history were also had no significant differences in the severity of the disease (Table 5).

**Table 5**. Characteristics of Covid-19 patients (Travel history based).

| Travel history | Signs and symptoms | | | | |
|---|---|---|---|---|---|
| | Asymptomatic | Simple symptoms | Mild symptoms | Sever symptoms | Total |
| YES | 3 (3.19%) | 2 (3.77%) | 2 (5.40%) | 2 (7.69%) | 9 (4.28%) |
| NO | 91 (96.80%) | 51 (96.22%) | 35 (94.59%) | 24 (92.30%) | 201 (95.71%) |
| Total | 94 (44.76%) | 53 (25.23%) | 37 (17.61%) | 26 (12.38%) | 210 |

**Job title**
Housewives made up the majority of patients that took part in the study. Frontline workers, such as health workers (18.57%), critical retail personnel (18.09%) ranked as second-highest numbers among patients. Other categories with lower percentages were students, police officers, soldiers, children, and instructors. Retired, handicapped, employees came with the following percentages; (3.80%), (0.95%), (4.28%) respectively. However, no significant relationship was observed in the term of the severity of the disease (Table 6).

**Table 6.** Characteristics of COVID-19 patients (Job based).

| Job title | Signs and symptoms | | | | |
|---|---|---|---|---|---|
| | Asymptomatic | Simple symptoms | Mild symptoms | Sever symptoms | Total |
| EARNER | 14 (14.89%) | 11 (20.75%) | 7 (18.91%) | 6 (23.07%) | 38 (18.09%) |
| RETIRED | 4 (4.25%) | 3 (5.66%) | 0 (0%) | 1 (3.84%) | 8 (3.80%) |
| HOUSEWIFE | 17 (18.08%) | 10 (18.86%) | 14 (37.83%) | 7 (26.92%) | 48 (22.58%) |
| STUDENT | 18 (19.14%) | 4 (7.54%) | 4 (10.81%) | 2 (7.69%) | 28 (13.33%) |
| HANDICAPPED | 0 (0%) | 0 (0%) | 1 (2.70%) | 1 (3.84%) | 2 (0.95%) |
| CHILD | 6 (6.38%) | 3 (5.66%) | 2 (5.40%) | 1 (3.84%) | 12 (5.71%) |
| EMPLOYEE | 4 (4.25%) | 3 (5.66%) | 1 (2.70%) | 1 (3.84%) | 9 (4.28%) |
| SOLDUER | 5 (5.31%) | 3 (5.66%) | 3 (8.10%) | 3 (11.53%) | 14 (6.66%) |
| HEALTH CARE WORKER | 23 (24.46%) | 10 (18.86%) | 4 (10.81%) | 2 (7.69%) | 39 (18.57%) |
| POLICEMAN | 2 (2.12%) | 3 (5.66%) | 1 (2.70%) | 0 (0%) | 6 (2.85%) |
| TEACHER | 1 (1.06%) | 3 (5.66%) | 0 (0%) | 2 (7.69%) | 6 (2.85%) |
| Total | 94 (44.76%) | 53 (25.23%) | 37 (17.61%) | 26 (12.38%) | 210 |

## Outcomes

The majority of COVID-19 patients (96.19%) had recovered. Among the recovered people, (98.93%) were asymptomatic, (96.22%) had simple symptoms, (91.98%) with mild symptoms, and lastly (92.30) had severe symptoms. Only (3.80%) of patients have passed away. The most common symptoms for dead patients were mild and severe symptoms (Table 7).

**Table 7.** Characteristics of Covid-19 patients (Outcomes based).

| Outcomes | Signs and symptoms | | | | Total |
|---|---|---|---|---|---|
| | Asymptomatic | Simple symptoms | Mild symptoms | Sever symptoms | |
| DIED | 1 (1.06%) | 2 (3.77%) | 3 (8.10%) | 2 (7.69%) | 8 (3.80%) |
| RECOVERED | 93 (98.93%) | 51 (96.22%) | 34 (91.98%) | 24 (92.30) | 202 (96.19%) |
| Total | 94 (44.76%) | 53 (25.23%) | 37 (17.61%) | 26 (12.38%) | 210 |

## Correlations

The table below illustrates the Pearson correlation between different parameters that have been taken into consideration in this study. Pearson correlation analysis showed that gender has a link (p <0.05) with occupations, and the same relationship has been observed between signs and symptoms, age of patients, and outcomes. Nonetheless, a stronger link (p <0.01) has been noticed between age of patients, contact, and outcomes with comorbidities. Additionally, career showed a connection with contact. Furthermore, travel history, outcomes, comorbidities, signs and symptoms showed a close correlation with contact. Lastly, travel history was found to have an intense correlation with outcomes (Table 8).

**Table 8.** Correlations between different parameters in Covid-19 patients.

| | | Gender | AGE GROUP | JOB TITTLE | CONTACT | TRAVEL HISTORY | OUTCOME | COMORBIDITIS | SIGNES AND SYMPTOMS |
|---|---|---|---|---|---|---|---|---|---|
| Gender | Pearson Correlation | 1 | .006 | -.169-* | -.046- | .077 | .010 | .084 | -.046- |
| | Sig. (2-tailed) | | .927 | .014 | .510 | .268 | .884 | .227 | .508 |
| | N | 210 | 210 | 210 | 210 | 210 | 210 | 210 | 210 |
| AGE GROUP | Pearson Correlation | .006 | 1 | -.298-** | .306** | -.042- | -.329-** | .335** | .170* |
| | Sig. (2-tailed) | .927 | | .000 | .000 | .548 | .000 | .000 | .014 |
| | N | 210 | 210 | 210 | 210 | 210 | 210 | 210 | 210 |
| JOB TITTLE | Pearson Correlation | -.169-* | -.298-** | 1 | -.309-** | .058 | .117 | -.117- | -.094- |
| | Sig. (2-tailed) | .014 | .000 | | .000 | .402 | .090 | .090 | .177 |
| | N | 210 | 210 | 210 | 210 | 210 | 210 | 210 | 210 |
| CONTACT | Pearson Correlation | -.046- | .306** | -.309-** | 1 | -.306-** | -.234-** | .191** | .352** |
| | Sig. (2-tailed) | .510 | .000 | .000 | | .000 | .001 | .005 | .000 |

|  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
|  | N | 210 | 210 | 210 | 210 | 210 | 210 | 210 | 210 |
| TRAVEL HISTORY | Pearson Correlation | .077 | -.042- | .058 | -.306-** | 1 | .204** | -.123- | -.071- |
|  | Sig. (2-tailed) | .268 | .548 | .402 | .000 |  | .003 | .075 | .303 |
|  | N | 210 | 210 | 210 | 210 | 210 | 210 | 210 | 210 |
| OUTCOME | Pearson Correlation | .010 | -.329-** | .117 | -.234-** | .204** | 1 | -.122- | -.146-* |
|  | Sig. (2-tailed) | .884 | .000 | .090 | .001 | .003 |  | .077 | .035 |
|  | N | 210 | 210 | 210 | 210 | 210 | 210 | 210 | 210 |
| COMORBIDITIS | Pearson Correlation | .084 | .335** | -.117- | .191** | -.123- | -.122- | 1 | .072 |
|  | Sig. (2-tailed) | .227 | .000 | .090 | .005 | .075 | .077 |  | .298 |
|  | N | 210 | 210 | 210 | 210 | 210 | 210 | 210 | 210 |
| SIGNES AND SYMPTOMS | Pearson Correlation | -.046- | .170* | -.094- | .352** | -.071- | -.146-* | .072 | 1 |
|  | Sig. (2-tailed) | .508 | .014 | .177 | .000 | .303 | .035 | .298 |  |
|  | N | 210 | 210 | 210 | 210 | 210 | 210 | 210 | 210 |
| *. Correlation is significant at the 0.05 level (2-tailed). |  |  |  |  |  |  |  |  |
| **. Correlation is significant at the 0.01 level (2-tailed). |  |  |  |  |  |  |  |  |

## DISCUSSION

This is a large-scale report of 210 confirmed Covid-19 patients by RT-PCR test. This data and results are significant in providing valuable information on dynamic profile of Covid-19 infected patients. Our data suggest that age has no substantial impact on COVID-19 incidence. According to (WHO), all individuals of different ages are at the risk of being infected by COVID19. However, elderly is at higher risk of more serious and perhaps deadly illness. Interestingly, our results showed patients' age didn't impact the clinical characteristics and prognosis of the disease. This is maybe due to the fact that some elderly is healthy with no pre-existing medical conditions or at a good immune status. It has been reported that elderly are extremely affected by Covid-19 is due to the malfunctioning of their immune system. The immune system must achieve very important activities, such as recognize, alert, destroy, and clear the virus in order to suppress and remove the infections and these activities may not be achieved properly in elderly individuals [11]. However, comorbidities are another detrimental factor that showed a significant Person value (p < 0.043) in our study. It has been shown that older adult and those with any medical history such as hypertension and diabetes has been found to have a sever covid-19 infections [8]. To enter the cell, coronavirus uses ACE-2 receptors, which present on the surface of the host cell. Certain comorbidities are linked to increased ACE-2 receptor expression, which entrance the viral entry into host cell [12]. Thus, the observed correlation between severity of Covid-19 infection and older age, poorer blood pressure control, and cardiovascular disease could be explained [13]. It has been also reported that chronic respiratory diseases (CRD) increasing the severity of COVID-19 symptoms. Infected COVID-19 patients with CRD suffered higher ventilator-associated pneumonia and pulmonary embolism. When coronavirus infects patients with CRD then they need a high medical care and also they had a higher fatality rate [14].

Additionally, Gender is also considered a determining factor for COVID-19 infection. Male have greater expression of angiotensin-converting enzyme-2 (ACE 2; coronavirus receptors) than female, indicating sex-based immunological differences caused by sex hormone and the X chromosome. Furthermore, gender behavior (lifestyle), for example, higher levels of smoking and drinking among males compared to women, contributes to the inequality in the number of

deaths. Finally, a study has shown that women are more responsible than men when it comes to the Covid-19 pandemic. Men have more attitudes, which contribute increase the possibility of getting infections such as frequent hand washing, face mask use, and stay-at-home orders [15]. Indeed, our findings confirm this fact as male patients are more included in our study than female. Moreover, the majority of patients included in this study has no active travel history and were asymptomatic. However, most of those who had been abroad experienced severe symptoms, and this maybe they catch a potent variant of coronavirus in comparison to the one that has been spread in the local. In this study, participants have also been sorted according to their occupations. Some jobs put people at higher risk of COVID-19 infection. Frontline workers such as health professionals, critical retail workers, policemen, soldiers, and other essential careers to the community have made the largest number of patients in our study. The fatality rate of COVID-19 patients in our study showed that only 3.80% of patients died and the rest were survived the disease

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