



Covid-19 Infection Among Asymptomatic and Symptomatic Patients in Kuwait

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Abstract

Objective: Discuss the importance of early transmission control at the onset of an epidemic with special reference to healthcare workers in Covid-19 centers.

Summarize the clinical characteristic if fined for Covid -19 patients attending the Covid -19 centers.

Discuss the implication for design of diagnostic strategies for HCWs at risk of COVID-19.

Aim: To assess the prevalence of asymptomatic individuals in this outbreak and to describe the clinical presentation of patients with mild and moderate Covid-19.

To estimate the asymptomatic ratio- the percentage of carriers with no symptoms will improve understanding of COVID-19 transmission and the spectrum of disease it causes, providing insight into epidemic spread.

Keywords: COVID-19; Outbreak; Kuwait

Background

In December 2019, an outbreak of pneumonia of unknown origin was observed in the city of Wuhan, Hubei Province, China. A novel coronavirus, named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was identified as the etiologic agent responsible for the outbreak. Coronavirus disease 2019 (COVID-19), then spread outside of Hubei to different parts of China and too many other countries [1-4,6-9]. The World Health Organization defined it as a pandemic on March 11, 2020 [1,5,10-13].

The clinical spectrum of COVID-19 can range from asymptomatic infection to mild upper respiratory tract illness to severe interstitial pneumonia with respiratory failure and even death. COVID-19 is initially characterized by flu like symptoms of fever, sore throat, cough, and dyspnea [8]. As the disease, progresses then immune mediated organ damage can kick in resulting in multi-organ damage and worsening clinical condition.

Some patients with COVID-19 are a symptomatic and show no significant sign of disease. The Center for Disease Control and Prevention estimates that 35% of COVID-19 cases are asymptomatic, and that 40% of transmission occurs before symptom onset (CDC, 2020). Following the SARS-CoV-2 infection of a healthcare worker, contact screening identified that 56% of those testing positive for SARS-CoV-2 were asymptomatic clearly, these asymptomatic cases may act as a reservoir and are critical to the community spread of the virus [11].

It is estimated that non-severe patients with no symptoms or mild symptoms could represent 30-60% of all infections [13]. These asymptomatic and symptomatic cases are unlikely to seek medical attention or be tested so the exact burden of mild and asymptomatic disease can remain unknown. However, this group forms is critical to the community spread of the virus [11]. Although the number of confirmed asymptomatic cases is small, the actual patient population may be quite high [7].

We aim to identify the asymptomatic vs symptomatic disease burden (COVID-19) in Kuwait and also try to understand the clinical presentation of mildly symptomatic COVID-19 patients. We believe that this information can provide some important clues in improving our future strategies for controlling similar pandemics.

Methods

Study design, setting and duration

- COVID-19 pandemic was centrally managed in Kuwait by dividing the whole country into five health regions.
- We performed a descriptive cross-sectional study over a period of six months in ten community based COVID-19 centers throughout the five health regions in Kuwait during the period from 25/5/2020 to 1/9/2021.
- Ethical clearance and approval to conduct this research was obtained from the MOH research Ethics Committee No (1818/2021).

Inclusion and exclusion criteria

- The inclusion criteria were: (1) All confirmed Covid-19 (Kuwaiti and non-Kuwaiti) patients that attended Covid-19 centers. (2) All age groups. (3) Symptomatic and Asymptomatic positive SARS-CoV-2 PCR diagnostic test.
- The exclusion criteria was all positive Covid-19 patients that not attends COVID-19 Centers for any reason.
- Confirmed COVID-19 case was defined as the one with a positive real-time RT-PCR assay.

Asymptomatic infection was defined as patients with no symptoms such as fever, cough, or diarrhea but had a positive real-time RT-PCR assay.

A pre-symptomatic case was defined as a patient with no symptoms at diagnosis time but during follow-up symptoms developed.

Patients with no symptoms at screening point were defined as the number of asymptomatic patients plus the number of pre-symptomatic patients.

Home isolation policy

The COVID-19 committee in Kuwait implemented a home isolation policy for confirmed COVID-19 cases included that all

positive PCR testing patients should visit the COVID-19 Primary Health Care Centers after receiving SMS messages, should download Shlonik application and to follow the home isolation policy.

The COVID-19 Primary Health Care Centers had private consultation entry and exit clinic rooms with, and was under the operation of a licensed and well-trained medical team included (physicians and nursing staff, pharmacists, Lab technician, x-ray technician and administrative), who were trained of the principal infection control measures required for suspected COVID-19 cases. The medical team available daily 12/6 via 6-h shifts.

The COVID-19 Primary Health Care Centers had security staff for the supervision with a 24 hrs shift.

The COVID-19 Primary Health Care Centers was provided by basic necessary medical equipment at the facilities like oximetry, blood pressure monitors, thermometers, an equipped emergency rooms with cardiopulmonary resuscitation cart and ECG machines, pharmacy provided with medications like vitamin C, vitamin D, zinc, paracetamol.etc. and x-ray room equipped with chest x-ray machine.

All Staff had a special place to change and put on PPE before and after entering the clinics.

On arrival, all patients were signed a pledge to follow home isolation and Shlonik application and the infection control measures if the home is suitable for isolation.

If home is not suitable for isolation or patient cannot be committed to home isolation policy patients was send for institutional isolation.

All patients that visit the COVID-19 Primary Health Care Centers were documented through COVID electronic medical records.

COVID-19 patients who had normal investigation and no risk group took consent for compliance, send for 10-days period home isolation after implementation of Shlonik APP, and followed by phone calls every 72 hrs.

Those patients who had normal investigation and high risk group for severe disease followed by phone calls every 48 hrs on days 4,7 and 10.

Those patients who had deterioration of symptoms or any abnormal clinical assessment like respiratory distress, abnormal CBC results, abnormal Blood pressure, abnormal respiratory rate, abnormal heart rate...etc., had low oxygen saturation, or had chest x-ray abnormalities referred to ER in local hospital and continue phone calls follow up within 24 hrs.

At each follow up calls physician evaluate a patient’s symptoms including respiratory status and his general condition and medication.

At the end of the 10-days period of home isolation each patients visited the COVID-19 Primary Health Care Centers again to check that he is free of any symptoms and to release home isolation certificate, those who remained symptomatic another 4 days isolation can be given.

Study type

Retrospective cross-section cohort study.

We extracted epidemiological, demographic and clinical data from a central COVID-19 database grouped patients into symptomatic and asymptomatic groups according to their clinical symptoms including fever, cough, sore throat, vomiting, diarrhea, loss of smell/taste and others.

Statistical methods

Data were analyzed by using SPSS software, version 21. Chi square test was used, + ve difference was statistically significant if p < 0.05.

Results

Demographic and baseline data

The study included 345,530 PCR positive COVID-19 patients. Only 53.6% of these patients were symptomatic and the remaining 46.3% were asymptomatic as shown in table 1.

184,900 of PCR positive patients were Kuwaiti (53.5%) and 160,630 were non-Kuwaiti (46.4%) as shown in table 1. The symptoms reported by all of the confirmed cases were shown in table 4.

Of the 345,530 who tested positive 174,917 were females (50.6%) and 170,613 were males (49.3%) as shown in table 3.

Age range was 1-90 years, and the median age was 44 year in symptomatic and asymptomatic. Majority of infections (symptomatic and asymptomatic) were in the 21-40 years age group as shown in table 4.

Distribution of symptoms in COVID-19 patients according to the health area

The distribution of symptomatic and asymptomatic infections varied by the region from which patients came as shown in table 2.

Regions of Ahmadi showed higher symptomatic infections in contrast to Hawali region who showed higher rates of asymptomatic infections.

Regions of Jahra showed lower symptomatic infections in contrast to Capital region showed lower rates of asymptomatic infections.

Patient symptomatic/ Asymptomatic	Kuwaiti N (% of total)	Non-Kuwaiti N (% of total)	Total Kuwaiti and Non-Kuwaiti (% of total)
Symptomatic	107,979 (31.2%)	77,462 (22.4%)	185,441 (53.6%)
Asymptomatic	76,921 (22.2%)	83,168 (24%)	160,089 (46.3%)
Total	184,900 (53.5%)	160,630 (46.4%)	345,530

Table 1

Health area	Symptomatic N (% of total)	A-symptomatic N (% of total)	Total (symptomatic and Asymptomatic) N (% of total)	Overall P- value
Capital	36,415 (10.5%)	13,349 (3.8%)	49,764 (14.4%)	0.220
Hawali	46,779 (13.5%)	52,150 (15 %)	84,862 (24.5%)	
Farwaniya	23,006 (6.6%)	48,191 (13.9%)	71,197 (20.6%)	
Ahmadi	65,633 (18.9%)	20,811 (6 %)	86,444 (25%)	
Jahra	21,467 (6.2%)	26,129 (7.5%)	47,596 (13.7%)	
Total	184,900 (54%)	160,630 (46%)	345,530	

Table 2

Symp/Asymp	Nationality	Gender	Total %	P-value
Symptomatic	Kuwaiti	Male	42,536 (12.3%)	0.157
		Female	65,443 (18.9%)	
	Non-Kw	Male	40,647 (11.7%)	
		Female	36,815 (10.6%)	
Asymptomatic	Kuwaiti	Male	38,226 (11.06%)	
		Female	38,695 (11.1%)	
	Non-Kw	Male	49,204 (14.2%)	
		Female	33,694 (9.8%)	

Table 3

Age group	Kuwaiti N (% of total)	Non-Kuwaiti N (% of total)	Total Kuwaiti and Non-Kuwaiti (% of total)	p-value
0-20Y	41,413 (11.9%)	11,537 (3.33%)	52.95 (15.3%)	0.213
21-40Y	85,429 (24.7%)	84,777 (24.5%)	170.206 (49.25%)	
41-60 Y	45,239 (13%)	58,161 (16.8%)	103.4 (29.92%)	
Above 60 Y	12,819 (3.7%)	6,152 (1.7%)	18,971 (5.49%)	
Total	184.9	160.63	345.53	

Table 4

Distribution of symptoms in COVID-19 patients

Coughing was the most common reported symptoms (23.9%), followed by fever (15.2%), smell and taste loss (13.6%), sore throat (8.83%) and GIT symptoms like vomiting and diarrhea (3.5%) as

shown in table 6. Other symptoms like bone ache, headache, chest pain, sleep disturbances, and difficult breathing represent (27.1%) of the total symptoms as shown in table 5.

Symptoms presented by the patients	Kuwaiti N (% of total)	Non-Kuwaiti N (% of total)	Total Kuwaiti and Non-Kuwaiti (% of total)	P value
Fever	30,981 (8.9%)	21,723 (6.2%)	52,704 (15.2%)	0.224
cough	43,612 (12.6%)	39,259 (11.3%)	82,907 (23.9%)	
Sore throat	18,265 (5.2%)	12,258 (3.5%)	30,523 (8.83%)	
Vomiting/diarrhea	7,532 (2.1%)	4,598 (1.3%)	12,130 (3.51%)	
Loss of smell/taste	32,303 (9.3%)	15,020 (4.3%)	47,323 (13.6%)	
others	57,669 (16.6%)	36,004 (10.4%)	93,673 (27.1%)	
Total	190,362	128,898	319,260	

Table 5

Comorbidities	Kuwaiti N (% of total)	Non-Kuwaiti N (% of total)	Total Kuwaiti/non-Kuwaiti % N (%)	P-value
Lung diseases	3,646 (1.05%)	781 (0.226%)	4,427 (1.2%)	0.231
CVD (heart failure, uncontrolled hypertension, IHD)	4,236 (1.2%)	2,607 (0.75%)	6,843 (1.9%)	
Cancer	171 (49.4%)	73 (21.1%)	244 (0.07%)	
Bone marrow disease	93 (26.9%)	40 (11.5%)	133 (0.03%)	
Immunodeficiency	165 (47.7%)	41 (11.8%)	206 (0.05%)	
HIV/Aids	12 (3.4%)	5 (1.4%)	17 (0.004%)	
Uncontrolled Diabetes	3,092 (0.89%)	1,802 (0.52%)	4,894 (1.4%)	
Kidney disease	360 (0.104%)	123 (35.5%)	483 (0.13%)	
Prolonged use of steroids	488 (0.141%)	98 (28.3%)	586 (0.16%)	
Late pregnancy	740 (0.104%)	247 (71.4%)	987 (0.285)	

Table 6

Distribution of co-morbidities in COVID-19 patients

About 5.4% of the included patients had at least one comorbidity, CVD including heart failure, uncontrolled hypertension, IHD was the most common comorbidity (1.9%) followed by uncontrolled Diabetes (1.4%), lung disease (1.2%), Cancer (0.07), Immunodeficiency (0.05%), Bone marrow disease (0.03%), Kidney disease (0.13%), Prolonged use of steroids (0.16%), late pregnancy (0.28%) and the least reported comorbidity was HIV/Aids (0.004) as shown in table 6.

There was no statistically significant association between any of the patients’ characteristics and symptomatology (p-value = 0.231).

Discussion

The presented study showed that out of the 345,530 only 185,441(53.6%) were symptomatic while the remaining 160,089(46.3%) were asymptomatic.

Asymptomatic Covid-19 is one of the features of this pandemic. The number of asymptomatic COVID-19 patients reported here is greater than those estimated by other studies, where they were 46.3% for Kuwaiti and non-Kuwaiti while it was 12.1 percentage in Saudi Arabia, [8] and 27.7%, 8.6%, 7.9% respectively in China [6,7,22].

Analysis showed that symptomatic adults COVID-19 patients were mostly up to 27.6% and up to 6.9% in children less than 20 years, which is similar to previous research results that showed children symptoms were relatively mild [22].

The clinical presentation of symptomatic patients showed that fever was present in 15.2% patients which is less than a large study of adults infected by SARS-CoV-2 who had fever in 78% on presentation [23] and 75,7% in other study [19].

Patients presented with cough was present in 23.9% which is less than another study who had cough in 82.2% [19] and 55.6% [13] on presentation.

Sore throat was present in 8.83% patients, which is less than another study who had sore throat in 12.4% [1].

GIT symptoms like vomiting and diarrhea was present in 3.5% patients, which is similar to other study [9,23].

Smell and taste loss was present in 13.6% patients which is less than a previous study reported in Saudi Arabia [8] and other study in Belgium [19].

Other symptoms like bone ache, headache, chest pain, sleep disturbances, and difficult breathing was present in 27.1% patients.

About 5.4% of the included patients had comorbidities and this is less in contrast to the cited percentage of 32%-93% in different studies [10].

Hypertension and diabetes mellitus was the most comorbidities in patients with Covid-19 in other studies [13].

Conclusion

- The finding of this study showed that percentage of symptomatic Covid-19 patients more than asymptomatic but both of them need to be isolated as early as possible for observation as a source of infection and to control the transmission of Covid-19.
- Preventive medicine physician should follow the close contacts of positive Covid-19 patients to avoid secondary transmission.
- In this study we find that fever and cough remain the most prevalent symptoms of adults infected by SARS-CoV-2.
- Our research recommendation for further studies are implementation of this study in a wider level on the prevalence of COVID-19 infections and reviewing the preventive and management strategy.

Recommendation

Based on the finding of this study, there are recommendation to follow in future:

Policy makers

- Encourage health education in the community regarding infection control measures (e.g. hand hygiene, wearing masks and following MOH instruction)for early transmission control.

- The managers in Primary Health Care Centers should give more attention on Post Covid-19 sequale and complication after home isolation by establishing post - Covid-19 syndrome clinics.
- Design a diagnostic strategy for HCWs at risk of Covid-19.
- Revise protocols regarding the use of rapid point- of care diagnostic testing, effective antiviral therapies, and eventually a safe vaccine.

Health care workers

- The staff should be aware of clinical manifestation of Covid-19 symptoms for early screening and isolation to avoid spread of infection.
- The staff should use self-assessment tools-patient education materials for infection control and self-home isolation.
- All staff should be compliant to the infection control measures including PPE.

Other future research's

Further studies are needed in a wider level considering the socio-demographic characteristics of covid-19 cases and contacts.

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