Lateef e*t al*

The Prevalence and Clinical Characteristics of The Healthcare Workers Infected with Sars Cov-2 in Baquba Teaching Hospital, Diyala-Iraq

The Prevalence and Clinical Characteristics of the Healthcare Workers Infected with SARS Cov-2 in Baqubah Teaching Hospital, Diyala-Iraq

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Abstract

Background: In 2019, a novel coronavirus was identified. It first appeared in Wuhan, China and caused a cluster of pneumonia cases. The virus was named severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). The World Health Organization designated the disease COVID-19 (coronavirus disease 2019).

Objective: To find the prevalence of COVID-19 infection among symptomatic frontline and non-frontline healthcare workers, their main complaint and clinical outcomes.

Patients and Methods: This is a cross sectional study done on retrospective data in which all symptomatic healthcare workers in Baqubah teaching hospital were involved in the study and full questionnaire forms were filled. Nasal and throat swabs were taken for polymerase chain reaction test and high-resolution computed tomography were done.

Results: From (1413) symptomatic healthcare workers tested for COVID-19 (185) were positive yielding a (13%) prevalence from the total employed healthcare workers in Baqubah teaching hospital, with (63%) were male. Most of the affected were nurses (63.2%) ,(59.5%) of the affected healthcare workers were non-frontline staff. Fever was the most common symptom and was seen in(79.5%) followed by shortness of breath in(63.8%).The disease course was mild in (83.8%) of the affected healthcare workers and only (2.7%) need admission to the hospital and the mortality rate was (0.5%).

Lateef e*t al*

The Prevalence and Clinical Characteristics of The Healthcare Workers Infected with Sars Cov-2 in Baquba Teaching Hospital, Diyala-Iraq

Conclusion: Most infections among healthcare workers occurred during the last two months of the disease outbreak. The prevalence of the COVID-19 infection among our healthcare workers was high and mostly in non–frontlie staff. Rapid identification of staff with potential infection and routine screening among asymptomatic staff could help protect other healthcare workers.

Keywords: COVID-19; Healthcare workers; Baqubah teaching hospital

Introduction

In 2019, a novel coronavirus was identified. It first appeared in Wuhan, China and caused a cluster of pneumonia cases. The virus was named severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). The World Health Organization designated the disease COVID-19 (coronavirus disease 2019) [1]. Then it was declared a pandemic by the World Health Organization on March 11, 2020. It continues to disrupt life for millions around the globe [2].

An Iraqi family of four who returned from Iran tested positive for the coronavirus in Kirkuk governorate. They were the first Iraqis known to have caught the disease, a day after an Iranian student in the Najaf governorate became Iraq's first confirmed case on February 24th, 2020 [3]. Subsequently, the number of confirmed cases were increased all over the country with over (100,000) confirmed cases and (4,000) deaths countrywide as of July 25th, 2020 [4].

In the fight against COVID-19, Healthcare workers are the most important human resource for hospitals [5]. Healthcare workers (HCWs) potentially experience greater risks for emerging infectious diseases [6-8] due to occupational exposure to sick patients and virus-contaminated surfaces [9]. Contagious HCWs may infect patients, co-workers and family members. Moreover, the removal of ill (HCWs) from duty can threaten essential healthcare staffing during an epidemic [10].

Therefore, infection prevention and quick, accurate diagnosis of potential COVID-19 in (HCWs) are crucial to maintaining hospital operations [11].

Testing of staff at our institution may also have provided a limited snapshot of the SARS-CoV-2 prevalence in the community (i.e. those are not requiring hospital admission) with mild influenza-like illness or persistent cough.

The aim of this study is to find the prevalence of COVID-19 infection among symptomatic frontline and non-frontline healthcare workers, their main complaint and clinical outcomes.

Patients and Methods

This is a cross-sectional study done on retrospective data in which all symptomatic healthcare workers in Baqubah teaching hospital were involved in the study and full questionnaire form was filled including the patient demographic data, clinical features, PCR result, CT result, treatment ,outcome, and history of contact with COVID-19 patients. The period was from May 20th 2020 to July 31st 2020 which is the period where the number of cases increased both in the hospital and the community.

Lateef e*t al*

The Prevalence and Clinical Characteristics of The Healthcare Workers Infected with Sars Cov-2 in Baquba Teaching Hospital, Diyala-Iraq

The policy in our hospital is all symptomatic healthcare workers with respiratory complaints, gastrointestinal complaints or fever are seen by physicians and full investigations are done, including nasal and throat swabs for Polymerase Chain Reaction (PCR) test. The patient kept isolated at home pending the investigation result come. All confirmed cases were given (14-21) day sick leave and according to the severity of the disease.

Procedure : Health workers at the laboratory were trained for performing nasal and throat swabs, which include insertion of flexible synthetic nasal fiber into one nostril for 2-3 seconds with rotation for 360 degrees for 10-15 seconds ,the same procedure were done on the other nostril, also wooden stick was applied for throat swab with same procedure used for nasal swab ,both swabs were placed for each viral transport media ,all samples were sent to Diyala –public health laboratory within 1 hour and refrigerated until to be tested later by PCR.

Investigation of samples

All swab samples were tested at Diyala public health laboratory – molecular biology unit with two steps; automated extraction (Dane gene extraction kits) which done by automated extraction device (smart32) and real-time PCR methods (sacace BIOTECHNOLOGIES kits) by analytical

PCR device .The time for results ranged from 6-8 hours, all results were interpreted as positive and negative and send to the hospital.

For those with typical signs and symptoms who had negative (PCR) chest computed tomography was done using Toshiba device.

Statistical analysis

Given the descriptive nature of this study analysis for statistical significance was not performed. Continuous variables were expressed as medians. Categorical variables were summarized as counts and percentages. There were no missing data. All analyses were performed with SPSS statistical software version 25.0.

Results

A total of (1413) symptomatic healthcare workers were tested for COVID-19 from May 20th 2020 to July 31st, 2020. From them (185) staff members were tested positive for COVID-19, yielding an overall prevalence of (13%) from the total number of healthcare workers in the hospital. From them 117 (63%) were male with median age (28).

PCR positive were found in (175) (94.6%) of them, while others 10 (5.4%) were PCR negative, but they had typical signs and symptoms with typical computed tomography (CT) chest findings. Most of affected healthcare workers were nurses 117(63.2%) Table (1).

Lateef e*t al*

The Prevalence and Clinical Characteristics of The Healthcare Workers Infected with Sars Cov-2 in Baquba Teaching Hospital, Diyala-Iraq

Table (1): Demographic characteristics of patients

	Positive PCR n=175		Negative PCR n=10		Total n=185	
	n	n	n	%	n	%
Sex						
Male	113	117	4	40	117	63.2
Female	62	68	6	60	68	36.8
Age group (years)						
20-30	118	123	5	50	123	66.5
31-40	36	38	2	20	38	20.5
41-50	14	16	2	20	16	8.6
51-60	7	8	1	10	8	4.3
Medical profession						
Medical doctor	29	34	5	50	34	18.4
Nurse	113	117	4	40	117	63.2
Other healthcare worker	33	34	1	10	34	18.4

In this study the most affected healthcare workers 110(59.5%) work in non-frontline wards and had no direct contact with SARS COVI-19 positive cases, Table (2).

Table (2): Distribution of the affected healthcare workers according to their workplaces

	Positive PCR		Negative PCR		Total	
	n	%	n	%	n	%
Frontline						
Male	53	76.8	4	66.7	57	76
Female	16	23.2	2	33.3	18	24
Non-Frontline						
Male	57	53.8	3	75	60	54.5
Female	49	46.2	1	25	50	45.5
Total	175	100	10	100	185	100

The most common complaint was fever in 147 (79.5%) of affected healthcare workers and shortness of breath in 118 (63.8%) of them, while 11(5.9%) were asymptomatic. Medical comorbidities like cardiac, pulmonary, immune diseases and tumors were found only in 23 (12.4%) Table (3).

Lateef e*t al*

The Prevalence and Clinical Characteristics of The Healthcare Workers Infected with Sars Cov-2 in Baquba Teaching Hospital, Diyala-Iraq

Table (3): The main symptoms of affected healthcare workers and comorbidities

Symptoms (n=185)	No. (%)
Fever	147 (79.5)
Muscle aches	87 (47)
Difficulty breathing	118 (63.8)
Fatigue	113 (61)
Anosmia	101 (54.6)
Cough	31 (16.8)
Loss of taste	99 (53.5)
Headache	66 (35.7)
Sore throat	47 (25)
GIT symptoms	30 (16)
No symptoms	11 (5.9)
Comorbidities (one or more)	
Chronic lung disease	4 (2.2)
Tumors and immune system disease	7 (3.8)
Diabetes mellitus	8 (4.3)
Hypertension	7 (3.8)

In this study most of the affected healthcare workers 155 (83.8%) develop mild disease course, while only 8 (4.3%) develop severe disease Table (4).

Table (4): Distribution of cases according to the disease severity

MILD	Positive n=149		Negative n=6		Total n=155	
	n	%	n		n	%
Male	95	63.8	4	Male	95	63.8
Female	54	36.2	2	Female	54	36.2
MODERATE	Positive n=20		Negative n=2		Total n=22	
	n	%	n	%	n	%
Male	12	60	1	50	13	59
Female	8	40	1	50	9	41
SEVER	Positive n=6		Negative n=2		Total n=8	
	n	%	n		n	%
Male	2	33.3	2	Male	2	33.3
Female	4	66.7	0	Female	4	66.7

Only 5 (3%) healthcare workers need hospital admission in the COVID-19 words due to severe signs and symptoms with bilateral more than 50% involvement of the lungs with low oxygen saturation on pulse oxymetry Figure (1).

Lateef e*t al*

The Prevalence and Clinical Characteristics of The Healthcare Workers Infected with Sars Cov-2 in Baquba Teaching Hospital, Diyala-Iraq

Figure (1): The percentage of cases who required hospitalization

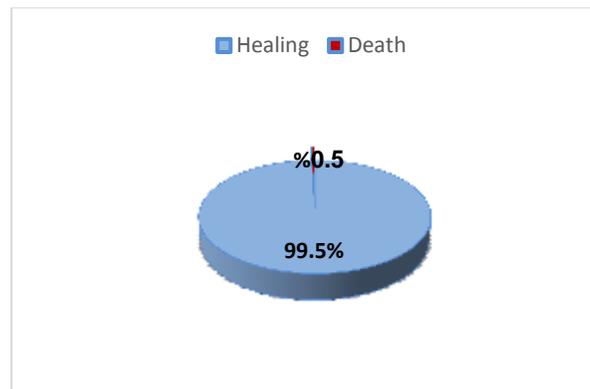About the outcome only one dead healthcare worker which constitutes (0.5%) mortality rate Figure (2).

Figure (2): The mortality rate among healthcare workers

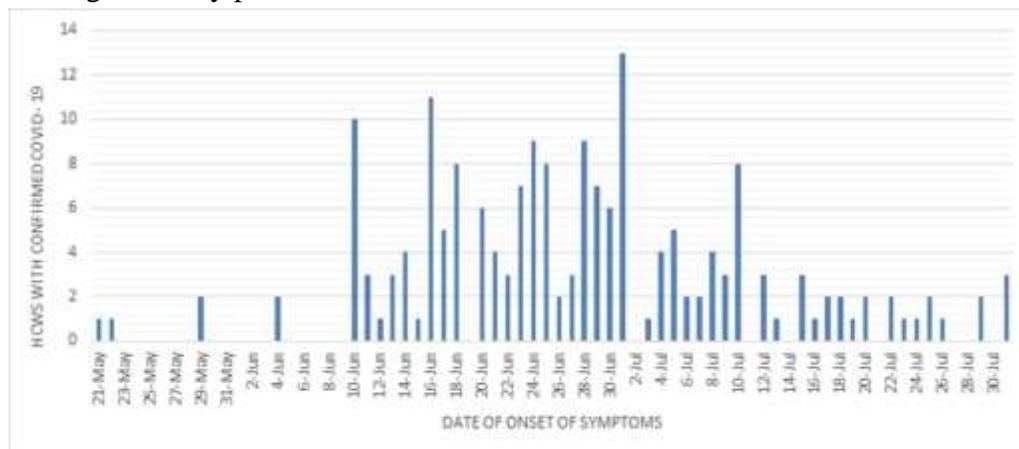The distribution of the affected healthcare workers during the study period was shown in Figure (3).

Figure (3): Date of onset of symptoms for the healthcare workers with confirmed COVID-19

Lateef e*t al*

The Prevalence and Clinical Characteristics of The Healthcare Workers Infected with Sars Cov-2 in Baquba Teaching Hospital, Diyala-Iraq

Discussion

In this study, the prevalence of the affected healthcare workers in Baqubah teaching hospital was (13%) and this was higher than what found in a study from the USA in 2020 [12] in which the prevalence was (5.3%), And also higher than the prevalence found by a study done in Germany in 2020 [13] which found (1%) prevalence. Also, it's higher than what is found in a study from Wuhan, China in 2020 [14] in which the prevalence was (1.1%). But it's lower than the prevalence found in a study from the United Kingdom in 2020 [15] in which the prevalence was (18%). And this difference may be due to the difference in the sample size and time of collection of the sample.

Most of the affected healthcare workers in our study were nurses (63.2%) and this agrees with the study from Wuhan, China in 2020 [14] in which the nurses affected (54.6%) but it's higher than what found in studies from the United Kingdom [15] and Germany [13] in 2020 which show that nurses form (48% and 28%) respectively.

In this study, most of the affected healthcare workers (59.5%) work in non-frontline wards and this agrees with the study from Wuhan, China in 2020 [14]in which the non-frontline workers compose (84.5%). But it disagrees with the study from USA in 2020 [12] in which the non-frontline workers compose only (33.5%) of the affected healthcare workers. And another study from the USA in 2020 [16] shows that (77.1%) of the affected healthcare workers were from frontline staff.

Fever was the most common complaint and seen in (79.5%) of the cases followed by shortness of breath in (63.8%) of them. And this agrees with the study from Wuhan, China in 2020 [14] in which fever was the most frequent complaint, and seen in (60.9%). While other studies from the USA [12,16] and Germany [13] showed that fever was not the most common complaint and seen in only (38.4%,41.7% and 53%, respectively).

Medical comorbidities like cardiac, pulmonary, immune diseases and tumors were found only in (12.4%) and this was comparable to the percentage seen in the studies from the USA [12] and Wuhan, China [14] in which the percentage of the healthcare workers who had chronic medical illnesses were see (12.4% and 12.7%, respectively) but it is lower than that found by another study from the USA [16] which found that (47.9%) of the healthcare workers had chronic medical illnesses.

Most of the affected healthcare workers in this study had a mild disease course and this agrees with the study from the Germany [13] which revealed that most healthcare workers with COVID-19 experienced mild disease. And the other study from Wuhan, China in 2020[14] which revealed that (84.5%) of the affected healthcare workers with COVID-19 had non severe disease.

Also (2.7%) of the affected healthcare workers were required hospitalization in this study. And it is comparable to the finding in the studies from the USA [12] and Germany [13] which revealed a hospitalization rate of (3.2% and 2%, respectively). But it is higher than the rate found by the study from the United Kingdom in 2020 [15] which state that none of the staff who tested positive for SARS-CoV-2 required hospital admission at the time of their positive result. And it is

Lateef e*t al*

The Prevalence and Clinical Characteristics of The Healthcare Workers Infected with Sars Cov-2 in Baquba Teaching Hospital, Diyala-Iraq

lower than the rate found by another the USA study in 2020 [16] which revealed that hospitalization rate was (6.3%).

About the mortality rate in our study it was (0.5%), which is lower than that found in the study from Wuhan, China in 2020 [14] which showed a mortality rate of (0.9%). But it is higher than the other studies from the USA [12,16], Germany [13] and United Kingdom [15] in 2020 when all of them showed a that mortality rate was zero.

Conclusions

Most infections among healthcare workers occurred during the last two months of the disease outbreak and it is the time of increase in the infection rates all-over the country. That the prevalence of the COVID-19 infection among our healthcare workers was high and mostly in non–frontt-line staff so full personal protective measures were needed with good personal hygiene. Rapid identification of staff with potential infection and routine screening among asymptomatic staff could help protect other healthcare workers.

Recommendations

1-That good personal hygiene and wearing personal protective equipment(PPE) were very important for all healthcare workers not only for frontline one.

2-Contineous full training courses on who to use(PPE) were needed.

3-Another study needed to follow those infected staff for any future complications.

4-Increasing laboratory capacity to allow widespread testing of the staff could be

a vital tool in achieving adequate staffing during the COVID-19 outbreak, and

reducing the risk of transmission to vulnerable patients.

Source of funding: Nill

Ethical clearance: This study was granted ethical approval from the Ethical Committee of the Collage of Medicine at Diyala medical University.

Conflict of interest: The author declares that there is no conflict of interest regarding the publication of this article.

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Lateef e*t al*

The Prevalence and Clinical Characteristics of The Healthcare Workers Infected with Sars Cov-2 in Baquba Teaching Hospital, Diyala-Iraq

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