Coronavirus 2019: 10 Days Outcome in Tertiary Health Care Center in Saudi Arabia: A Retrospective Study Phase One

Abdulaziz O AlSebiheen*, Abdulrahman M AlHumoud, Afaf M AlNefisah, Faisal A AlDughaim, Mohammad A Sabban , Suliman A Aljummah and Abdulaziz S AlAli

Department of Emergency Medicine, King Faisal Specialist Hospital and Research Center in Riyadh, Saudi Arabia

*Corresponding Author: Abdulaziz O AlSebiheen, Department of Emergency Medicine, King Faisal Specialist Hospital and Research Center in Riyadh, Saudi Arabia.

Abstract

Background: Previously studied multi-center study in Saudi Arabia focused on clinical characteristics and outcome in a national study, in our retrospective tertiary care center study. The epidemiological, clinical presentation, laboratory, imaging and outcome of 305 patients will be assessed and examined in a tertiary health care center in Saudi Arabia aiming to discover differences in the mentioned parameters in our population in comparison to the international patients.

Methods: This was a retrospective study (phase one) with aiming to describe and analyze all patients (305) with confirmed SARs-Cov 2 infection admitted in 1st of March till 31st 2020 in terms of clinical presentation, risk assessment and 10 days post admission outcome admitted to King Faisal Specialist Hospital and Research Center (KFSHRC) located Riyadh, Saudi Arabia.

Results: In our study, data analysis of 305 cases in terms of clinical characteristics showed a mean age of 40.6 years, women represented 156 out of 305 (51.1%) of the cases, patients with hypertension, diabetes or combined represent 137 out of 305 (48.9%) of the cases. Immunocompromised cases including transplant, autoimmune, and cancer were 26 out of 305 (8.6%). The mean of Incubation periods was 4.43 days while length of stay was 0.79 days. Vital signs abnormalities include temperature above 38 (32.8%), heart rate above 120 beats per min (16.1%). Laboratory findings suggesting elevation of lymphocytes (40%). Imaging modalities including chest x-rays showed Ground glass opacities with bilateral, peripheral and lower lung zone distribution in 38 out of 305 (12.5%) patients, while CT chest showed a Ground Glass Opacification in 50 out 305 (16.4%) of the patients. Intensive care unit (ICU) length of stay mean of a total of (n = 21) was 9.4 days. Post admission day 10 outcome showed improvement of 252 out of 305 (82.6%) patients and discharged home.

Conclusion: In this retrospective study, the Primary outcome: post admission day 10 outcome showed improvement of 252 out of 305 (82.6%) patients and discharged home. Secondary outcome: The effective measures selected as post admission outcomes showed 2 doses of Tocilizumab 400 mg intravenous every other day is an effective treatment for critical care patients with 88.8% improvement as no non-invasive ventilation or mechanical ventilation needed after adding it to the Hydroxychloroquine with Azithromycin regimen.

Keywords: Saudi Arabia; Covid-19; Coronavirus; Clinical Characteristics; Tocilizumab

Introduction

Coronaviruses belong to the Nidovirales as a superfamily. Nidovirales consist of three families; one of them is coronaviridae that descends into two subfamilies coronavirinae and torovirinae. Corona virinae is subdivided into 4 groups, alpha, beta, gamma, and delta coronavirues. Corona viruses are enveloped in positive sense strand RNA with the largest RNA genome known [1,2].

Corona viruses are named for their character of crown-like Appearance particles (virions) that dot their surface. This family of viruses are able to infect a wide range of vertebrates, and it is one of the major causative agents to viral respiratory infections [3,4]. After the discovery of the novel coronavirus (COVID-19), there are now a total of 7 coronaviruses known to infect humans: 1-Human coronavirus 229E (HCoV-229E). 2-Human coronavirus NL63 (HCoV-NL63) 3-Human coronavirus OC43 (HCoV-OC43) 4-Human coronavirus HKU1. 5-Severe acute respiratory syndrome-related coronavirus (SARS-CoV). 6-Middle East respiratory syndrome-related coronavirus (MERS-CoV). 7-Novel coronavirus (COVID-19, also known informally as Wuhan corona-virus) [5].

Severe Acute Respiratory Syndrome Related Coronavirus 2 (SARs-Cov-2) which is known as a novel coronavirus that caused Coronavirus Disease 2019. The story starts in November 2002 when SARS-Cov started its outbreak in Guangdong, China, then followed by MERS-Cov in Saudi Arabia June 2012. Until the last version of this family COVID-19 are detected in December 2019 in Wuhan, Hubei Province, China start to invade the world until it reached to 185 countries and 339645 cases all over the world within 3 months this represent real global health threat it may lead to crash of all health system around the world. A lot of countries started to take precautions such as closing schools, shutting down all unnecessary shops, and applying curfew for all citizens in countries. This reminds us about what happened in 1918 when the Spanish flu H1N1 pandemic led to similar precautions taken nowadays [6-8].

Literature Review

Wang D., *et al.* (2020) described the epidemiological, clinical, laboratory and outcome in hospitalized patients described in retrospective, single-center case series of 138 consecutive hospitalized patients with confirmed novel corona infected pneumonia at Zhongnan Hospital of Wuhan University in Wuhan China from January 1 to January 28, 2020 and resulted in finding the following data. Median age was 56 years and 75 out of 138 were men (54.3%). Common symptoms were fever in 136 (98.6%), fatigue in 96 (69%) and dry cough in 82 patients (59.4%). The median time from first symptom to dyspnea was 5.0 days, to hospital admission was 7.0 days and to ARDs was 8.0 days. Lymphopenia (0.8 × 109/L) occurred in 97 (70.3%). Chest computed tomographic scans showed bilateral patchy shadows or ground glass opacity in the lungs of all patients. Most of the patients received Oseltamivir 124 (89.9%) and many received antibiotics including moxifloxacin 89 (64.4%), ceftriaxone 34 (24.6%) and azithromycin 25 (18.1%) and glucocorticoid therapy in 62 patients (44.9%). The outcome of this study showed 36 of the patients were transferred to Intensive care unit (ICU) due to complications including acute respiratory distress syndrome 22, arrhythmia in 16, and shock in 11 patients as of February 3, 47 patents were discharge with median hospital stay of 10 days, 6 died and the remaining patients were still hospitalized [9].

Alsofayan Y.M and Colleagues (2020) described the clinical characteristics of COVID-19 in Saudi Arabia; a national multi-center retrospective study of 1519 cases with epidemiological parameters including median age of 36 years as men represent 54.3% of the cases, incubation period of 6 days. The most common symptoms were cough (89.4%), fever (85.6%), and sore throat (81.6%). Out of 1519 cases, the patients had comorbidities including diabetic (7.6%) and Hypertensive (8.8%). Patients with vital signs abnormalities represent 20.3% with temperature > 38^{0}C, 1.6% with heart rates > 125 beats/min, and 4.7% with respiratory rates > 24 breaths/min. Laboratory findings suggested lymphocytopenia in 37.5% of all cases. While for the disposition 71.6% of patients were admitted to hospitals and 4.7% in intensive care units [10].

The epidemiological, clinical presentation, laboratory, imaging and outcome of 305 patients will be assessed and examined in a tertiary health care center in Saudi Arabia aiming to discover differences in the mentioned parameters in our population in comparison to the international patients.

Aim of the Study

This study was made to evaluate and record the differences of many parameters including but not limited to clinical presentation and outcome between COVID 19 confirmed admitted patients in March 2020 in a tertiary health care center in Saudi Arabia and compare it to the international data aiming to find a solid evidence which contributes in overcoming the crisis of the large global outbreak of COVID-19.

Methods

This was a Retrospective study with aiming to describe and analyze all patients (305) with confirmed SARs-Cov 2 infection (positive result by polymerase chain reaction testing of a nasopharyngeal sample) admitted in March 2020 in terms of clinical presentation, risk assessment and 10 days post admission outcome admitted to King Faisal Specialist Hospital and Research Center (KFSH and RC) located Riyadh by using PowerChart and patients' paper files. Inclusion criteria All confirmed COVID-19 admitted patients of all ages (adult and pediatrics) and pregnant women in KFSH and RC in Riyadh in March 2020. The stored data will be managed and analyzed by a biostatistician

Results

In our study, data analysis of 305 cases in terms of clinical characteristics showed a mean age of 40.6 years, females represented 156 out of 305 (51.1%) of the cases, patients with hypertension, diabetes or combined represent 137 out of 305 (48.9%) of the cases. Immunocompromised cases including transplant, autoimmune, and cancer were 26 out of 305 (8.6%). The mean of Incubation periods was 4.43 days while length of stay 0.79 days. Vital signs abnormalities include temperature > 38 (32.8%), heart rate > 120 beat per min (16.1%) increase in respiratory rate > 20 breaths per min (15.1%), and O_2 saturation below 88 represent (3%) of the patients. Laboratory findings suggest elevation of lymphocytes (40%) followed by D-dimer (30.5%), and WBC (29.5%) overall. Imaging modalities including chest x-rays showed Ground glass opacities with bilateral, peripheral and lower lung zone distribution in 38 out of 305 (12.5%) patients, while CT chest showed a Ground Glass Opacification in 50 out 305 (16.4%) of the patients. Intensive care unit (ICU) length of stay mean of a total of (n = 21) was 9.4 days. Discharge days mean was 10.8 days while post admission day 10 outcome showing improvement of 252 out of 305 (82.6%) and 7 out 305 (2.3%) patients deteriorated while 37 out of 305 discharged prior completing 10 days in the hospital. As for Disposition, 297 out of 305 (97.4%) discharged, while 4 out of 305 (1.3%) deceased.

Patient were categorized into 4 groups, asymptomatic 63 out of 305 (20.7%), symptomatic without pneumonia 160 out of 305 (52.5%), pneumonia without hypoxia 63 out of 305 (20%), and pneumonia with hypoxia 13 out of 305 (4.3%). In addition to the common critically ill group in which any of 4 groups developed acute respiratory distress syndrome (ARDS) 10 out of 21 patients (47.6%) followed by multiple organ failure 2 out of 21 patients (9.5%).

Asymptomatic patients (n = 63) were treated by isolation 57%, while 12% required Azithromycin and 2% received Hydroxychloroquine. Symptomatic without pneumonia (n = 160) managed by Pneumonia without hypoxia (n = 63) were treated with Azithromycin and Hydroxychloroquine 88.7%, while 56.7% of the patients received ceftriaxone and 4% received tazocin. Pneumonia with hypoxia (n = 13): 8 out 9 patients (88.8%) received Tocilizumab in addition to Azithromycin and Hydroxychloroquine during Intensive care unit stay showed Improvement and discharged safely while only one patient received the same regimen show no improvement (11.1%) in comparison to the patients 4 out of 13 who received only Hydroxychloroquine alone or with Azithromycin were deteriorated.

Patient with symptoms without evidence of pneumonia compared asymptomatic patients in different aspects including gender P-value of (0.078) as it showing 50.3% males were symptomatic in comparison to female (44.9%), age groups with P-value of (< 0.001) from 19 to 30 (34.8%) and 31 to 50 (39.2%) total of 166 out of 305 were symptomatic in comparison to population from 50 to 70 total of 70 cases out of 305 with 62% symptomatic patient, patient above 70 years (86.4%) were symptomatic during hospital stay. In terms of length of stay with P-value of (0.033); the admitted patients for 7 to 21 days (100%) were symptomatic while less than a 7 days stay 48.9% were symptomatic. In terms of hospitalization outcome 46.8% of discharge patients were symptomatic.

Patient confirmed with Pneumonia compared in term of low oxygen saturation < 88% (hypoxia) including gender as it showing 81.2% males were hypoxic in comparison to female (77.6%), age groups with P-value of (< 0.001) from 19 to 30 (89.1%) and 31 to 50 (84.2%)

total of 166 out of 305 were hypoxic in comparison to population from 50 to 70 total of 70 cases out of 305 showing 60% hypoxia during hospital stay. In terms of length of stay with a P-value of (0.505); during the hospital stay the admitted patients for 7 to 14 days (60%) were hypoxic while less than a 7 days stay showed hypoxia in (79.3%). In terms of hospitalization outcome with P-value of (< 0.001) 46.8% of discharged patients were hypoxic (75.0%) while deceased patients (79.5%) during hospital stay.

	Count (N = 21)	Percent (%)
ARDS	10	47.6
Multiple Organ Failure	2	9.5
Shock, ARDS	2	9.5
Dialysis	1	4.8
Hypotension	1	4.8
Respiratory distress	1	4.8
Shock, Multiple Organ Failure, ARDS	1	4.8
Shock, Multiple Organ Failure, ARDS, Severe respiratory	1	4.8
acidosis and severe lactic acidosis		
Shock, Multiple Organ Failure, ARDS, subarachnoid	1	4.8
Hemorrhages		

Table 1: Critically ill patients with COVID-19 pandemic.

	Count (N = 305)	Percent (%)
Lymphopenia	124	40.7
Elevated aminotransferase	45	14.8
Elevated C-reactive protein	38	12.5
Elevated D-dimer	102	33.4
Elevated Erythrocyte sedimentation rate	93	30.5
Elevated White blood cell count	90	29.5
Elevated lactate dehydrogenase	68	22.3
Elevated procalcitonin	74	24.3
Normal lab values	70	23.0

Table 2: Abnormal laboratory investigations during hospitalization.

		Unt (N = 305)	Percent (%)
Chest X-ray	Normal	200	65.6
	Round glass opacities with bilateral, peripheral and lower lung zone	38	12.5
	Distribution		
	More than one finding	21	6.9
	Consolidation	15	4.9
	Opacity in the right or left lower lung zone	14	4.6
	Round glass opacities with bilateral, peripheral and lower lung zone	2	0.7
	Distribution, in the right or left lower lung zone		
	Non-relevant findings	10	3.3
	Not done	5	1.6

Chest CT	Ground Glass Opacifications	50	16.4
	Normal	22	7.2
	Ground Glass opacifications with mixed consolidation	13	4.3
	Ground Glass Opacifications with superimposed septal thickening	4	1.3
	Not done	171	56.1
	Missing information	34	11.1

Table 3: *Results of radiographic examination.*

	Count (N = 21)	Percent (%)
Combination therapy (more than one)	11	52.3
Tocilizumab	6	28.6
Lopinavir/Ritonavir (Kaletra)	1	4.7
Hydroxychloroquine/Chloroquine	1	4.7
IVIG	1	4.7
Oseltamivir	1	4.7

Table 4: *Management of critically ill patients.*

	Count	Percent
	(N = 305)	(%)
Improved	252	82.6
Discharge prior completion of 10 days inpatient in a stable condition with advice of self-isolation till 10 days completed asymptomatic	37	12.2
Deteriorated	7	2.3
Not followed after discharge by 10 days	4	1.3
Still Symptomatic	4	1.3
Missing information	1	0.3

Table 5: *Patients' outcome after 10 days of admission.*

Discussion

In comparison to a national study, Alsofayan Y.M and Colleagues (2020) named clinical characteristics of COVID-19 in Saudi Arabia in terms of genders; females represents (51.1%) in our study while men were 54.3% in their study, as for KFSH and RC asymptomatic patients represent 20.7%, while it was 9.3%. As for vital signs; elevated temperature > 38 represents 32.8% in our population in KFSH and RC versus 20.3% in the national study. Fever in symptomatic without pneumonia represented (n = 137) 77% of the patients out of 163, pneumonia without hypoxia represented (n = 55) 84.4% of the patients out of 63, and pneumonia with hypoxia represented (n = 55) 84.4% of the patients out of 63 in comparison to the national study were fever were representing 85.6%. Laboratory findings; elevation of lymphocytes (40%) almost similar to the national study as it was 37.5%. Imaging findings added to the KFSHRC study showing chest x-rays showed a Ground glass opacities with bilateral, peripheral and lower lung zone distribution in 38 out of 305 (12.5%) patients, while CT chest showed a Ground Glass Opacification in 50 out 305 (16.4%) of the patients while no data provided from national study as it was limited and unable to access as per the national study. ICU admitted patients (n = 21) represent 6.8% versus 4.7% in the national study.

For discharge days the mean was 10.8 days while post admission day 10 outcome showed improvement of 252 out of 305 (82.6%) with no data to compare from the national study.

During ICU stay of the 13 patients, 8 out 13 patients (88.8%) who received Tocilizumab in addition to Azithromycin and Hydroxychloroquine during critical care stay showed Improvement and discharged safely in comparison to the patients who received only Hydroxychloroquine alone or with Azithromycin.

Conclusion

Primary outcome: Post admission day 10 outcome showed improvement of 252 out of 305 (82.6%) patients and discharged home.

Secondary outcome: The effective measures selected as post admission outcomes showed 2 doses of Tocilizumab 400 mg Intravenous every other day is an effective treatment for critical care patients with 88.8% improvement as no non-invasive ventilation or mechanical ventilation needed after adding it to the Hydroxychloroquine with Azithromycin regimen.

Conflict of Interest

No conflict of interest.

Bibliography

1. Fehr AR and Perlman S. "Coronaviruses: an overview of their replication and pathogenesis". In Coronaviruses. Humana Press, New York, NY (2015): 1-23.

2. Weiss SR and Leibowitz JL. "Coronavirus pathogenesis". *In Advances in Virus Research* 81 (2011): 85-164.

3. Yip CC., *et al*. "A six-year descriptive epidemiological study of human coronavirus infections in hospitalized patients in Hong Kong". *Virologica Sinica* 31.1 (2016): 41-48.

4. Rottier JM. "Coronavirus: epidemiology, genome replication and the interactions with their hosts". *Virology in China: English Version* 1 (2016): 1-2.

5. Michaels, M. G., *et al*. "Coronavirus Disease 2019: Implications of Emerging Infections for Transplantation". *American Journal of Transplantation* (2020).

6. Rodriguez-Morales AJ., *et al*. "Clinical, laboratory and imaging features of COVID-19: A systematic review and meta-analysis". *Travel Medicine and Infectious Disease* (2020): 101623.

7. Giwa A and Desai A. "Novel Coronavirus COVID-19: An Overview for Emergency Clinicians. Emergency Medicine Practice". COVID-19 (2020).

8. Ferguson NM., *et al*. "Impact of non-pharmaceutical interventions (NPIs) to reduce COVID-19 mortality and healthcare demand" (2020).

9. Wang D., *et al*. "Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus–infected pneumonia in Wuhan, China". *JAMA: The Journal of the American Medical Association* (2020).

10. Alsofayan YM., *et al*. "Clinical characteristics of COVID-19 in Saudi Arabia: A national retrospective study". *Journal of Infection and Public Health* (2020).

Volume 5 Issue 11 November 2021