CLINICO-EPIDEMIOLOGICAL PRESENTATION AND OUTCOME OF COVID-19 INFECTED PATIENT IN HYDERABAD, PAKISTAN.

Muhammad Aslam Rind[1], Maria Nazir Khyber[2], Muhammad Saleem Rind[3], Iffat Jamal[4], Nazish Memon[5], Shahzad Shaikh[6].

ABSTRACT

Objective: To demonstrate the variability of clinical presentation and outcome of corona virus disease 2019 (COVID-19) infected patients in Liaquat University Hospital, Jamshoro. **Methods:** Observational prospective study was conducted from April-May 2020. Patients admitted in Liaquat University Hospital and confirmed as Covid-19 infected patients after real-time polymerase chain reaction test, irrespective of their age, gender and given consent of participation were included in the study. While patients with negative tests findings were excluded from the study. Epidemiological, clinical, laboratory and radiological data were collected. All the data was analyzed statistically using SPSS ver. 23. **Results**: Most (56.25%) of the patients were male and 73.66% of the participants were residing in urban areas. Two-third (77.67%) had a history of having direct contact with COVID infected persons.Moreover, 73.66% patients were presented without any COVID symptoms. Persistent dry cough (81.35%) was amongst the top symptom among the symptomatic cases followed by high grade fever (59. 33%).

Among the comorbidities, hypertension was the most common (17.85%) comorbidity followed by chronic obstructive pulmonary disease (17.65%).Among the laboratory findings, Leukopenia was observed in 20.98% patients while lymphopenia was observed in 12.05%. Complications were observed in 11.16% patients. The most common complication observed was Acute respiratory distress syndrome and acute kidney injury. **Conclusion:** COVID-19 is affecting younger adult (20-39 years), male, from urban area predominantly. Persistent dry cough &high grade fever are the more common symptoms. Moreover, Acute Respiratory Distress Syndrome and acute kidney injury are the most common complications.

Key Words: Acute kidney injury, Acute Respiratory Distress Syndrome, Corona virus disease

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1. Assistant Professor, Department of Medicine, LUMHS Jamshoro
2. Senior Registrar, Department of Medicine, LUMHS, Jamshoro
3. Assistant Professor, Department of Medicine, PUMHS, Nawabshah
4. FCPS-II (Traniee) General Medicine, Department of Medicine, LUMHS, Jamshoro
5. FCPS-II (Trainee) General Medicine, Department of Medicine, LUMHS, Jamshoro
6. FCPS-II (Traniee) Plastic Surgery, Department of Surgery, LUMHS, Jamshoro

Corresponding Author: Dr. Muhammad Aslam Rind**,** Assistant Professor, Department of Medicine, LUMHS Jamshoro**.** rindmuhammad119@gmail.com**.**

INTRODUCTION

World has faced numerous pandemics since the time of its existence. After severe acute respiratory syndrome (SARS) and Middle Eastern respiratory syndrome (MERS), Corona virus diseaseor COVID-19 also called as SARS-COV-2 is one of the greatest pandemics of recent years that has wreaked havoc not only within general population but also the global health care system.[1,2] Corona virus is the single stranded ribonucleic acid (RNA) virus that has the largest genome among all the RNA virus discovered so far.[3,4] This SARS-COV-2 is also a positive sense stranded and unsegmented virus belongs to the beta corona virus family.[4,5]

SARS-COV2 receptor or Human angiotensin converting enzyme 2 (hACE2) is the host factor that trigger the disease within the different organ systems.[6] The individuals specially with low immunity and/ or having any underlying diseases like; Diabetes mellitus, Hypertension, Cancers, Cardiovascular Disease, and Chronic Obstructive Pulmonary Disease are more susceptible to this virus.[7] Moreover, due to the weaker or compromised immune system, individuals like new-born and older age group or elderly people are more prone to acquire the SARS-COV-2.[8]

The virus originated last year in December 2019 for the first time in Wuhan, China. Due to its potential of infecting, millions of people in China got infected with this virus (SARS-COV-2).[9] The virus then spread to different countries and broadly affectedglobal population of 177 countries including; United States of America, Brazil, England, Spain, Italy, India, Pakistan etc. within few weeks of first reported case.[10]

AChinese scientist had isolated this Corona virus from a patient of pneumonia without known cause.[11] It was later designated Corona Virus Disease-2019 (COVID-19) in February 2020 by WHO.[12] This disease is primarily transmitted human to human via droplets as well as contact with fomites.[13] Around 59,34,936 laboratory confirmed cases of COVID-19 and 3,67,166 confirmed deaths have been reported in all over world as on 31st May 2020. Pakistan has reported 277,402 cases and 5,924 deaths due to the complications of COVID-19 until31July 2020.

The clinical spectrum of SARS-CoV2 infection appears to be extensive and variable that varies

from country to country i.e. from asymptomatic to mild to moderate dry cough, high grade fever, sore throat, myalgia, difficulty in breathing and upper respiratory tract illness.[14,15] Moreover, many of the infected ones specially those with immunocompromised condition may suffer from severe infections like severe respiratory distress, pneumonia, cardiac issueslike myocarditis etc., acute kidney injury(AKI), multiple organ dysfunction syndrome(MODS) and even deaths.[16, 17]

There is also a variability in the clinical presentation, severity of disease, prognosis and outcome has been observed in cases of COVID-19 disease worldwide.[18] Number of determinant factors likeage, viral strain, innate immunity, environmental factors and comorbidities among the affected population are postulated for this variability. Hence a prospective study was designed over laboratory confirmed COVID-19 patients who were admitted indifferent wards of Liaquat university hospital, Jamshoro, Sindh, Pakistan. The objective of the current studywas to demonstrate thevariability of clinical presentation and outcome of COVID-19 infected patients in Liaquat University Hospital, Jamshoro.

MATERIAL AND METHODS

The observational, prospective study was conducted at the different wards of Liaquat University Hospital (LUH), Jamshoro, Sindh from April 2020 to May 2020. All patients admitted in different wards of LUH, confirmed asCovid-19 infected cases on real-time polymerase chain reaction test(RT-PCR), given consent, irrespective of age and gender were included in the study. While those have negative RT-PCR findings and didn't gave consent for participation in the study were excluded. Ethical approval was sought from ethical review committee of Liaquat University of Medical and Health Sciences, Jamshoro.

Once admitted, all patients who were suspected to be having Covid-19 infection on the basis of clinical history, contact history and travel history as per ICMR guideline, underwent RT-PCR testing of oropharyngeal/nasopharyngeal swab for Covid-19. These RT- PCR confirmed covid-19 cases were then enrolled in the present study after written consent. Sociodemographic information like; age, gender, residence, profession, economic status, smoking habits etc. were recorded. Moreover, clinical information including; fever, cough, shortness of breath, myalgia, sore throat, headache, hemoptysis, diarrhea, hypotension, hypoxia and comorbidities were also recorded. All these patients were followed up over a period of hospital stay and complications were recorded inform cardiac involvement (myocarditis), renal involvement (AKI and CKD), ARDS and multiple organ dysfunction syndrome (MODS).

Following were the criteria taken to diagnose complication of covid-19 patients.

- *Cardiac involvement (myocarditis)*
  - History of acute onset pain chest suggestive of cardiac origin
  - Acute onset ECG changes in form tachycardia / bradycardia, interventricular conduction defects(IVCD), and secondary ST – T wave changes.
  - Elevated cardiac biomarkers (CPK-MB/ TROP-I)
- *Acute respiratory distress syndrome (ARDS) – Berlin 2017 criteria were taken*
  - Onset of illness < one week
  - Bilateral opacity in chest X-ray (not due to cardiac failure or fluid overload)
  - PaO2/FiO2 < 300
- *Multiple organ dysfunction syndrome (MODS) - 2 or more organ involvement*
  - Renal involvement (AKI/CKD)

  Raised urea and serum creatinine above the normal value (serum urea >40 mg/dl and serum creatinine>1.3 mg/dl). All these patients were investigated with a set protocol of investigation which includes complete blood count (CBC), fasting blood glucose (FBG), renal function test (serum urea & creatinine), liver function test (SGOT, SGPT, serum bilirubin and alkaline phosphatase) as, C reactive protein (CRP), erythrocyte sedimentation rate (ESR), lactate dehydrogenase (LDH), creatinine kinase-MB (CK-MB), arterial blood gas analysis (ABG), chest x-ray and ECG. Serum Trop I was measured in all patients where cardiac illness was suspected. Patients outcome was recorded in terms of discharged or death.

All the collected data was entered and analyzed statistically using SPSS ver. 23.

RESULTS

A total of 224 patients were confirmed as COVID-19 patients. Out of these patients, most patients belong to age group of 20-39 years followed by those belongs to age group 40-59years. Regarding the gender male were predominantly involved while over half patients were from urban area. Moreover, over two third of the patients had history of contact to laboratory confirmed COVID -19 cases, where as majority don't have any recent travelling. (Table 1)

Among comorbidities hypertension was the most prominent one followed by chronic obstructive lung disease (COPD), diabetes mellitus, cardiovascular disease or cardiac issues, renal issues and malignancy were observed. (Figure 1)

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Out of all patients studied, 165 (73.66%) patients were presented without any symptoms and diagnosed when came for laboratory test for COVID-19 while 59 (26.33%) patients were admitted with different symptoms. Persistent dry cough was among the top symptoms and 81.35% of patients reported to have dry cough followed by fever(59.33%),myalgia(50.84%),shortness of breath (49.15%), sore throat (47.45%) respectively. While 22.03% COVID positive patients also had complaints of headache, diarrhea (18.64%) and even hemoptysis(01.69%).

Table 3 is demonstrating the findings of laboratory investigation and radiological features of studied COVID-19 positive patients.

Out of 224 patients studied, complication was observed in 25 patients (11.16%). Among the complications, ARDS and AKI was observed in almost all of the patients with complications. (Table 3)

Furthermore, 96 (42.80%) patients were found to have atypical pneumonia on chest x-ray. Out of these 96 only 29 (30.20%) patients were having symptoms whileremaining 69.79% were asymptomatic. Silent hypoxia was also observed in 6 (02.67%) patients. Out of total 224 admitted COVID-19 positive patients, majority (97.76%) were recovered and discharged while 5 patients (02.23%) were died due to COVID-19.

Table 1. Epidemiological profile of COVID-19 patients

DEMOGRAPHIC VARIABLE	n	(%)
Age group		
< 20 years	10	4.47
20-39 years	106	47.33
40-59 years	65	29.00
60 and above	43	19.20
Gender		
Male	126	56.25
Female	98	43.75
Profession		
Healthcare profession	18	8.03
Labor	59	26.34
Shopkeeper	42	18.75
Businessman	37	16.17
Other	74	33.03
Residence		
Urban	165	73.66
Rural	59	26.34
Smoker		
Yes	89	39.73
No	135	60.26
History of contact with confirmed COVID cases		
Yes	174	77.67
No	50	22.32
Recent travelling History		
Yes	41	18.30
No	183	81.70
Any Comorbidity		
Yes	65	29.00
No	159	71.00

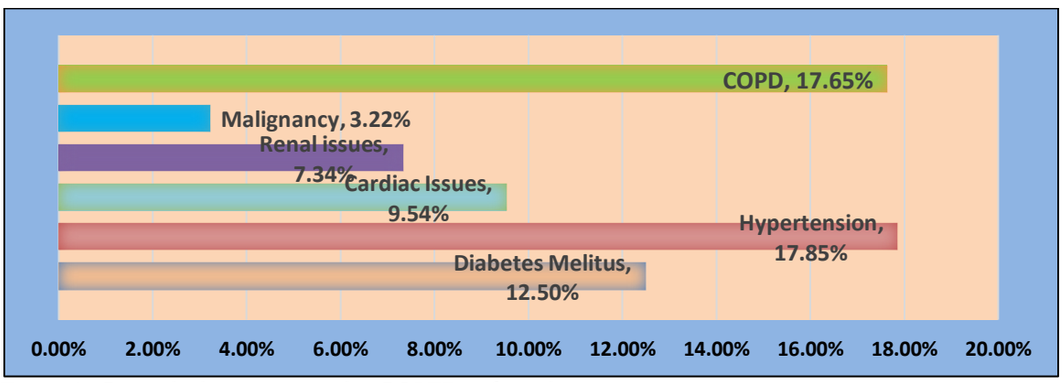

Figure1: Comorbidities among the COVID infected patients

Table 2. Laboratory and radiological features of COVID-19 patients

INVESTIGATION	VALUE	N	%
White blood count	>10000/ µL	14	06.25
	< 4000/ µL	47	20.98
Absolute lymphocyte count	<1500/ µL	27	12.05
Platelet count	>1,50000/ µL	32	14.28
S. Creatinine	>1.3 mg/dl	22	09.82
Total bilirubin	>1 mg/dl	11	06.69
Alkaline phosphatase	>116IU/L	92	41.07
AST	>37 U/L	38	16.96
ALT	>63 U/L	21	09.37
S. CRP	>3 mg/l	146	65.71
ESR	>20 mm/hr.	183	82.00
S. LDH	>234 U/L	203	91.00
Raised CKMB	>25 U/L	209	93.60
Raised Trop I	>0.014 ng/ml	08	03.50
Atypical pneumonia in chest X-Ray		96	42.80

Table 3. Complications in COVID-19 patients

COMPLICATIONS	n	%
• ARDS	22	09.80
• Myocarditis	08	03.57
• ARDS & Myocarditis both	06	02.60
• AKI	22	09.80
• MODS	15	06.69

DISCUSSION

The present study was conducted over 224 RT-PCR confirmed Covid-19 patients .It was observed that covid 19 infection occurred in the all age group ranging from infant to elderly. In the present study, most patients who tested positive for Covid-19 belonged to age group of 20-39 years followed by those belongs to age group 40-59 years at 47.33% and 29.0% respectively.This high rate of infectivity in young population may be due to the fact of high priority of travelling in this age group and possibly also due to a lack of taking proper precautionary measures. In the present study, more than half of the patients were male (56.25%) and such a type of male preponderance was also reported by many of the authors. Wei-jie*et al* and Bhandari *et al* reported similar male preponderance in 58.10% and 66.66% respectively.[13, 19] The most of the patients were fromurban population and from middle socioeconomic class.Regarding the profession, very few patients were health care worker (8.03%) where rest was from variable profession such as laborer (26.34%), shopkeeper (18.75%), businessperson (16.17%) and other profession (33.03%). Clinical spectrum of Covid 19 patients is wide and variable ranging from asymptomatic to critical illness. In the present study the most of patients were asymptomatic (73.66%), which was contradict with the study done by NiteshGupta*et al.* where 42.9% patients were asymptomatic.[20] Among symptomatic patients (59 patients) most common symptoms reported was cough (81.35%), fever (59.33%), myalgia (50.84%) and shortness of breath (49.15%), Bhandari *et al* observed similar type of finding where cough was majorclinical feature followed by fever, but the study done by Wang *et al* reported fever as the most common symptom.[19, 21] This variation between different studies may be explained by the fact that COVID-19 may present differently and varies country to country and region to region.Total 29.0% had comorbidities and among comorbidities hypertension was observed in maximum patients (17.85%) followed by chronic obstructive lung disease (17.65%), diabetes mellitus (12.50%), cardiovascular disease (9.54%), kidney disease (7.34%) and malignancy (3.22%). The studied population (n-224) underwent all routine investigation and found leukocytosis in 06.25%, leukopenia in 20.98%, lymphopenia in 12.50% and thrombocytosis in 14.28% patients. Bhandari *et al* and Zhang *et al* reported higher incidences of lymphopenia 52.38% and 75.4% in similar type of study.[19, 22] These results are higher than present study and the variation may be explained by the fact that the presentation and severity of patientpopulation is variable as in present study maximum patient were from asymptomatic group. Serum creatinine was raised in 22 patients (09.80%) whereas LFT was deranged in 132 patients (58.92%), out of LFT the most common liver enzyme affected was Alk. Phosphatase (41.07%). Most of patients had raised serum CRP (65.71%), ESR (82%), LDH (91%) and CKMB (93.60%) but Trop I was found significantly high only in 8 patients (03.50%). There was a gross difference in CPKMB and Trop I level in covid-19 patients. In the present study 96 patients (42.80%) had atypical pneumonia in chest roentgenogram out of them 67 patients (69.79%) were asymptomatic whereas only29 patients (30.24%) were symptomatic. Only 06 patients (02.67%) had silent hypoxia. Similar type of silent hypoxia was also reported by William Ottestad*et al*.[23]

Out of 224 patients studied, complications were observed in 25 patients (11.16%) and the most common complication observed was ARDS and kidney injury in 09.80% followed by MODS in 06.69%, myocarditis in 03.75% patients. Out of these 24 patients developed complications 19 patients survived where rest 5 of them died. The present study carried over 224 patients, the outcome was observed and was favorable in the form of discharge (97.76%) whereas case fatality rate was 02.23%.

CONCLUSION

COVID-19 is affecting younger adult (20-39 years), male, from urban area predominantly. Persistent dry cough &high grade fever are the more common symptoms. Moreover, Acute Respiratory Distress Syndrome and acute kidney injury are the most common complications.

ETHICS APPROVAL: The ERC gave ethical review approval

CONSENT TO PARTICIPATE: written and verbal consent was taken from subjects and next of kin

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REFERENCES

1. Gao GF. From "A" IV to "Z" IKV: attacks from emerging and re-emerging pathogens. Cell. 2018;172(6):1157-9.
2. Osman EEA, Toogood PL, Neamati N. COVID-19: Living through Another Pandemic. ACS Infectious Diseases. 2020.
3. Shen M, Zhou Y, Ye J, Al-Maskri AAA, Kang Y, Zeng S, et al. Recent advances and perspectives of nucleic acid detection for coronavirus. Journal of Pharmaceutical Analysis. 2020.
4. Lu R, Zhao X, Li J, Niu P, Yang B, Wu H, et al. Genomic characterisation and epidemiology of 2019 novel coronavirus: implications for virus origins and receptor binding. The Lancet. 2020;395(10224):565-74.
5. Monajjemi M, Shahriari S, Mollaamin F. Evaluation of Coronavirus families & Covid-19 proteins: molecular modeling study. Biointerface Res Appl Chem. 2020;10:6039-57.
6. Batlle D, Wysocki J, Satchell K. Soluble angiotensin-converting enzyme 2: a potential approach for coronavirus infection therapy? Clinical science. 2020;134(5):543-5.
7. Li G, Fan Y, Lai Y, Han T, Li Z, Zhou P, et al. Coronavirus infections and immune responses. Journal of medical virology. 2020;92(4):424-32.
8. Chang L, Yan Y, Wang L. Coronavirus disease 2019: coronaviruses and blood safety. Transfusion medicine reviews. 2020.
9. 9. Nishiura H, Jung S-m, Linton NM, Kinoshita R, Yang Y, Hayashi K, et al. The extent of transmission of novel coronavirus in Wuhan, China, 2020. Multidisciplinary Digital Publishing Institute; 2020.
10. Rothan HA, Byrareddy SNJJoa. The epidemiology and pathogenesis of coronavirus disease (COVID-19) outbreak. 2020:102433.
11. Gorbalenya AE, Baker SC, Baric R, Groot RJd, Drosten C, Gulyaeva AA, et al. Severe acute respiratory syndrome-related coronavirus: The species and its viruses–a statement of the Coronavirus Study Group. 2020.
12. McIntosh K, Hirsch MS, Bloom A. Coronavirus disease 2019 (COVID-19). UpToDate Hirsch MS Bloom. 2020;5.
13. Guan W-j, Ni Z-y, Hu Y, Liang W-h, Ou C-q, He J-x, et al. Clinical characteristics of coronavirus disease 2019 in China. New England journal of medicine. 2020;382(18):1708-20.
14. Williams FM, Freydin M, Mangino M, Couvreur S, Visconti A, Bowyer RC, et al. Self-reported symptoms of covid-19 including symptoms most predictive of SARS-CoV-2 infection, are heritable. MedRxiv. 2020.
15. Wang H-Y, Li X-L, Yan Z-R, Sun X-P, Han J, Zhang B-W. Potential neurological symptoms of COVID-19. Therapeutic Advances in Neurological Disorders. 2020;13:1756286420917830.
16. Wu T, Zuo Z, Kang S, Jiang L, Luo X, Xia Z, et al. Multi-organ Dysfunction in Patients with COVID-19: A Systematic Review and Meta-analysis. Aging and disease. 2020;11(4):874.
17. Zaim S, Chong JH, Sankaranarayanan V, Harky A. COVID-19 and multi-organ response. Current Problems in Cardiology. 2020:100618.
18. Struyf T, Deeks JJ, Dinnes J, Takwoingi Y, Davenport C, Leeflang MM, et al. Signs and symptoms to determine if a patient presenting in primary care or hospital outpatient settings has COVID-19 disease. Cochrane Database of Systematic Reviews. 2020(7).
19. Bhandari S, Bhargava A, Sharma S, Keshwani P, Sharma R, Banerjee S. Clinical profile of covid-19 infected patients admitted in a tertiary care hospital in north India. J Assoc Physicians India. 2020;68:13-7.
20. Gupta N, Agrawal S, Ish P, Mishra S, Gaind R, Usha G, et al. Clinical and epidemiologic profile of the initial COVID-19 patients at a tertiary care centre in India. Monaldi Archives for Chest Disease. 2020;90(1).
21. Wong E, Ho K, Wong S, Cheung A, Yeoh EJBWHOE-p. Workplace safety and coronavirus disease (COVID-19) pandemic: survey of employees. 2020;20.
22. Zhang J-j, Dong X, Cao Y-y, Yuan Y-d, Yang Y-b, Yan Y-q, et al. Clinical characteristics of 140 patients infected with SARS-CoV-2 in Wuhan, China. Allergy. 2020.
23. Ottestad W, Seim M, Mæhlen JO. COVID-19 with silent hypoxemia. Tidsskrift for Den norske legeforening. 2020.