

Research Article

Features of Corona Virus in Confirmed Elderly Patients in Lahore: Comparison with Young and Middle Aged

Muhammad Imran Hassan Khan¹, Muhammad Maqsood², Abdul Basit³, Zohaib Abbas Khan⁴

¹Department of Medicine, Ameer-ud-Din Medical College, Lahore General Hospital, PGMI; ²Department of Medicine, Ameer-ud-Din Medical College, Lahore General Hospital, PGMI; ³Department of Medicine, Ameer-ud-Din Medical College, Lahore General Hospital, PGMI; ⁴Director Technical (Addl); Drugs Testing Laboratory, Punjab

Abstract

Background: It was expected that Corona will spread in Pakistan, once first case was reported in late February 2020. Data from china, Europe and USA suggested more prevalence in Elderly. We also started having rapid increase once lock down was eased.

Aim: To evaluate clinical, laboratory and management parameters of Corona Virus in Elderly patients, in comparison with Young and Middle age patients. It would guide in future planning and management.

Methods: It was a prospective, descriptive and cross-sectional study, carried out after ERC approval from 8th April to 10th May, 2020. A performa was designed for data collection on clinical, laboratory and management parameters. SPSS 23 was used, including admitted patients in different hospitals of Lahore, excluding non-admitted and less than 15 years old.

Results: For Clinical features, young and middle age was prevalent nine times more than elderly. Past medical history of smoking and other medical problems was common in elderly. Symptoms of fatigue, respiratory and gastrointestinal were more in young and middle aged. Severity score CURB-65 2 and 4 were common in Elderly. CT scan was more involved in elderly for single and multiple lobes, but CRP was more raised in young. Co-morbidities of Acute respiratory distress, shock and secondary infection were common in elderly, and they also received less antibiotics than young and middle age. However, deaths were only present in young.

Conclusion: Corona was less common in elderly. Symptoms were more common in young, except smoking and past history, more in elderly with CURB- 65 score 2 and 4. Blood chemistries were similar, but CRP was higher in young. CT abnormalities more in elderly. Some co-morbidities were more common in elderly, and they received less antibiotics. Death was more common in young.

Corresponding Author | Dr. Muhammad Imran Hassan Khan, Associate Professor, Medical Unit-III, Ameer-ud-din Medical College, Lahore General Hospital, PGMI, **Email:** mimranhkhan@hotmail.com

Keywords | Corona, Elderly, Young and Middle Age, Featuresd

Introduction

China first reported new cases of corona virus in late 2019.¹ Lot of data was available from these patients, before it spread to other countries, and the steps taken by them showed that physical distancing played vital role. It was documented that the patients

of more than 65 had a higher mortality. As the disease spread to other countries, this information was rechecked. United States reported that more than 38% population affected was between 20 and 54, with more than 50% of them required monitoring in Intensive care units. In Europe, Netherlands and France reported that more than 50% of their serious patients

were under 50 years of age.² Another important observation was that patients who were smoking had more serious injuries.³ Since this disease was new, and information was deficient on many aspects, it was worth to explore findings in our setup. The definition of young and middle age and elderly was taken differently in literature. Some took elderly from 60 and above, and the remaining as young.⁴ However, according to oxford dictionary⁵, the middle age was between 45 and 65. Age below was young and above was elderly. We used this definition in dividing age groups.

Liu et al⁶ documented that lungs were mainly affected which increased burden on heart. This also led to poor control of blood sugar and increased susceptibility to infections. Elderly patients being more likely to have poor immunity, were more likely to have multi organ involvement and hence higher mortality. It would be worth documenting these age comparisons in our society, as this virus was new, and very little was known about it.

Zhu et al⁷ documented in a study that the lungs were involved in both the young and elderly patients. The involvement was more commonly ground glass opacification, with predominant bilateral involvement, as compared to unilateral. They also documented more gross abnormalities in older ages. Again, this information was worth checking in our population. It would be more valuable if we could check the clinical, laboratory and management parameters in our population.

In this study, we aimed to check clinical, laboratory and management parameters of Corona Virus in Elderly patients, in comparison with Young and Middle age patients. It would guide in future planning and management.

Methods

Government decided in Pakistan to keep all patients in government facilities, and did not allow them home quarantine, to decrease local transmission. It provided us opportunity to collect data from designated facilities. We selected only patients who were tested positive for RT-PCR. A prospective collection was done, after approval from the ethical committee of Ameer Ud Din Medical College/PGMI, Lahore General Hospital. Clinical, laboratory and manage-

ment parameters were collected and compared in Elderly and Young and Middle age groups.

Study Design

A Descriptive, Crossectional Study, with prospective collection of data after ERC approval from 8th April to 10th May 2020, was carried out.

Only covid-19 positive patients were included. Those below 15, or not admitted were omitted. All available patients in HDU, ICU or quarantine were included, who had positive RT-PCR.

Statistical Analysis

Data division was in both Continuous and Categorical variables. Continuous had mean and ranges and Categorical had numbers (percentages). Correlation was considered in categorical information. P value in Continuous variables was analyzed through ANOVA Test. The statistical software package of social sciences (SPSS 23.0) was used for study and P values <0.05 were taken as significant.

Results

The results of clinical, laboratory and management were compared in three tables, discussed below.

Clinical Features In Elderly Vs Young and Middle Age

Middle and Young age group was nine times more frequent than the Elderly, in this data. Males were more common in young and middle age and females in the elderly group. P value was not significant for these findings. It was also observed that patients with past history of smoking, chronic liver disease, chronic kidney disease, diabetes, hypertension, ischemic heart disease and atrial fibrillation were more common in the elderly group, whereas only cerebrovascular disease was more in middle and young age group. P value was significant for all past history problems, except atrial fibrillation and cerebrovascular accident.

When symptoms were analyzed, fatigue, nasal congestion, runny nose and sickness and vomiting were more common in young and middle age group, whereas fever was slightly more in elderly. Cough and sputum were comparable in each group. P value was insignificant for these results.

CURB 65 score was applied to assess risk of pneumonia. It was documented that score 2 and 4 were more in elderly group, and score 0, 1 and 3 were more in young and middle age group. P value was insignificant.

Laboratory Features In Elderly Vs Young and Middle Age

CT scan results were analyzed in both groups. It was seen that both multiple and single lobe involvement was more in the elderly group, whereas pleural effusion or no involvement at all, was frequent in the young and middle age groups. Ground glass appearance was equal in both groups.

It was documented that white cell count, neutrophil increase, lymphocyte decrease, hemoglobin, platelet count and serum creatinine were comparable and equal in both groups. Only CRP was significantly raised in young and middle age group. P value was not significant for any of these findings.

Management Features In Elderly Vs Young and Middle Age

In co-morbidities, it was seen that Acute Respiratory Distress Syndrome, secondary infections and shock were more frequent in elderly patients, whereas acute problems of heart and kidney were more frequent in young and elderly group. It was documented that acute liver injury was not seen in both groups. The P value was only significant for Acute respiratory distress syndrome and shock, and the rest were insignificant.

When treatment was compared, elderly received slightly more symptomatic treatment, whereas antibiotic use was more in the young and middle age group. Chloroquine and hydroxy chloroquine were also used marginally more in the same group. P value was insignificant.

For mechanical ventilation, both invasive and non-invasive were more common in young and middle age group. As outcome measure, deaths were only present in young and middle age group. P value was insignificant for ventilation and prognosis.

Discussion

Since this study was carried out in one of the biggest

cities of country, it was expected that all age groups will be included. Question was that do we need to prioritize certain ages for management or not? Elder-

Table 1: Clinical Features In Elderly Vs Young and Middle Age

	Elderly %	Young & Middle Aged %	P-Value
Total	31 (9.7%)	290 (90.3%)	
Gender			0.580
Male	25 (80.6%)	245 (84.5%)	
Female	6 (19.4%)	45 (15.5%)	
Smoking History	17 (54.8%)	109 (37.6%)	0.062
Past Medical History			
Chronic Liver Disease	2 (6.5%)	2 (0.7%)	0.006
Chronic Kidney Disease	4 (12.9%)	5 (1.7%)	<0.001
Diabetes	11 (36.7%)	29 (10.0%)	<0.001
Hypertension	18 (58.1%)	80 (27.6%)	<0.001
Ischemic Heart Disease	3 (9.7%)	2 (0.7%)	<0.001
Persistent Atrial Fibrillation	1 (3.2%)	2 (0.7%)	0.164
Cerebro-vascular Accident	0 (0%)	2 (0.7%)	0.644
Clinical Symptoms			
Cough & Sputum	8(25.8%)	71 (24.5%)	0.958
Fever	27 (87.1%)	242 (83.4%)	0.602
Fatigue	21 (70%)	230 (79.6%)	0.224
Nasal Congestion	14 (45.2%)	139 (48.1%)	0.757
Runny Nose	12 (38.7%)	150 (52.1%)	0.158
Sick & Vomit	10 (19.2%)	101 (23.3%)	0.785
Curb 65 Score			0.151
0	25 (83.3%)	244 (86.8%)	
1	2 (6.7%)	27 (9.6%)	
2	2 (6.7%)	8 (2.8%)	
3	0 (0%)	1 (0.4%)	
4	1 (3.3%)	1 (0.4%)	

ly have more associated co-morbidities and considering our joint family system, they were likely to stay home and less exposed than young and middle age. But what if infection was brought home?

Buckley et al⁸ discussed the steps in their study to “flatten the curve”. Overcrowding, lack of basic facilities and approach to available health resources were big issues. They did not document any preference for gender, but density of population was important factor in spread of virus. Our study was different from them as it was carried out in urban area, which were already densely populated. This data favoured more presence of young and middle age

Table 2: Laboratory Features In Elderly Vs Young and Middle Age

	Elderly %	Young & Middle Aged %	P-Value
Total	31 (9.7%)	290 (90.3%)	
CT Results			0.026
Multiple Lobe Lesion	5 (16.1%)	14 (4.8%)	
Single Lobe Lesion	3 (9.7%)	22 (7.6%)	
Pleural Effusion	0 (0%)	8 (2.8%)	
Not Done	18 (58.1%)	166 (57.2%)	
None	4 (12.9%)	71 (24.5%)	
Ground Glass	1 (3.2%)	9 (3.1%)	
Lab Indicators at Admission			
White Blood Cell Count x 10 ⁹ /l	7.2 (4.6 – 11)	7.5 (3.5 – 12.9)	0.384
Total White Blood Cell Decreased n%	25 (80.6%)	237 (81.7%)	0.883
Total White Blood Cell Increased n%	6 (19.4%)	53 (18.3%)	0.883
Neutrophil proportion n%	72.8 (46 - 89)	71.5 (3.2 - 92)	0.405
Increased Neutrophil Proportion n%	5 (16.1%)	48 (16.6%)	0.952
Lymphocyte Ratio n%	26.9 (9 - 35)	26.9 (8 - 35)	0.989
Decreased Lymphocyte Ratio n%	28 (90.3%)	268 (92.4%)	0.681
C-Reactive protein (mg/l)	6.7 (2 - 35)	7.5 (2 -35)	0.691
Hemoglobin (g/dl)	12.7 (8.6 - 16)	12.3 (8 - 16)	0.185
Platelet (10 ⁹ /l)	264.7(180-410)	259.6 (105 - 554)	0.343
Serum Creatinine (mg/dl)	31.1 (9 - 85)	28.5 (12 - 62)	0.038

Table 3: Management Features In Elderly Vs Young and Middle Age

	Elderly %	Young & Middle Aged %	P-Value
Total	31 (9.7%)	290 (90.3%)	
Comorbidities			
Acute Respiratory Distress Syndrome	5 (16.1%)	19 (6.6%)	0.059
Acute Heart Injury	0 (0%)	1 (0.3%)	0.743
Acute Liver Injury	0 (0%)	0 (0%)	-
Acute Kidney Injury	0 (0%)	5 (1.7%)	0.462
Secondary Infection	1 (3.2%)	3 (1%)	0.299
Shock	2 (6.5%)	1 (0.3%)	0.001
Treatment Given			0.368
Symptomatic	29 (93.5%)	256 (88.3%)	
Antibiotic	2 (6.5%)	33 (11.4%)	
Chloroquine	0 (0%)	1 (0.3%)	
Mechanical Ventilation			0.748
Invasive	0 (0%)	1 (0.4%)	
Non-Invasive	26(83.9%)	276 (95.2%)	
Prognosis			0.571
Healed & Discharged	31 (100%)	287 (99%)	
Death	0 (0.0%)	3 (0.9%)	

patients. Presence of more males in this data could be explained in different ways. In our society, male

members were bread winners, moving out of home more often than females, resulting in exposure. They smoke more than females, and are relatively careless about their health issues.⁹ Young and middle age people also are more exposed as compared to elderly due to their job related movement. Presence of immune compromised status due to chronic diseases as well as the dietary status, makes elderly more susceptible to infection.¹⁰ But why was cerebrovascular history more in young group, requires further local research. We could not explain why few symptoms were more in young and middle age and others in elderly. Similarly, why was CURB 65 score 2 and 4 more in elderly in this data. We can assume that frequency of these features depended on the extent of exposure. It was also required to look, if hormones play any role, along with cytokine storm in these patients.

Jin et al¹¹ published a rapid guideline for disease diagnosis and subsequent management. They anticipated that CT changes can vary according to age, immune and co-morbid conditions, duration of disease and time of CT scan. There findings were variable, with multiple lobe involvement more likely, and single lobe less likely. Our patient data showed

more CT involvement in elderly patients, but it was equally more for both single and multiple lobes. Reason could be already existent elastin and collagen degradation in older age,¹² co-morbidities, and poor compliance to treatment. Zhu et al¹³ compared the inflammatory parameters in Covid patients. They documented that previous results about CRP being indicator of severity was same in their study. In our study, there was some difference, as blood chemistries were comparable, but high CRP was only in young and middle age group. It could be due to higher cytokine response in younger and middle ages, and more active immunity, but needs confirmation through evidence.

Liu et al¹⁴ published that physiotherapy had an important role in the management of patients with Covid 19. They documented that even if radiological improvement was not documented, the patients had significant lung function improvement with physiotherapy. Our elderly patients had more Respiratory distress, secondary infection and shock. This could be explained by poor mucociliary response,¹⁵ lesser antibiotic compliance and more prone environment of lungs for any inflammation.

Meng et al¹⁶ published timely, that the outbreak and the requirement for ventilation in it was unprecedented. No age group was spared, and 3.2% received ventilatory support. They summarized the best practices for it, and documented the risks associated with it. In our study, the total number going for ventilation was low. This could be due to better understanding of some features of virus and related management strategies. Of the small number requiring ventilation, higher rate and death in younger and middle ages could be explained by raised cytokine response in them, with higher mortality and need for ventilation.

Conclusion

Conclusion was that COVID-19 was nine times more common in young and middle age than elderly, with more males in young and vice versa in elderly. Past history of smoking and other chronic disease history was also common in elderly group. Fatigue, nasal symptoms and Gastrointestinal symptoms were more common in younger group, but CURB 65 score of 2 and 4 were common in Elderly. All laboratory

features were similar in both groups, except CRP, which was higher in young. CT scan findings in single and multiple lobes were common in elderly. Co-morbidities like Acute respiratory distress, shock and secondary infection were common in elderly, and they also received more symptomatic treatment and less antibiotics. No conclusion could be drawn on the chloroquine and hydroxy chloroquine in both groups. Death occurred only in young and middle age patients. Our data suggests that both groups should be given equal importance in treatment.

Limitations

There were few limitations in this study. It was a descriptive study. Better results could be drawn if a randomized study was done in future. Many clinically significant symptom patients were missed, as they were not admitted. It would have been better if they were also included. Many acute inflammation parameters were skipped, because of lack of resources.

Acknowledgements

It is time to thank the colleagues in Medical 3, Lahore General Hospital, for the efforts in data collection. Also, friends in Mayo, Services, Expo Center and Jinnah hospitals for unconditional facilitation.

References

1. Shim E, Tariq A, Choi W, Lee Y, Chowell G. Transmission potential and severity of COVID-19 in South Korea. *Int J Infect Dis* [Internet]. 2020 Mar 18; Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7118661/>.
2. Gasmi A, Noor S, Tippairote T, Dadar M, Menzel A, Bjørklund G. Individual risk management strategy and potential therapeutic options for the COVID-19 pandemic. *Clin Immunol* [Internet]. 2020 Apr 7; Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7139252/>.
3. Brake SJ, Barnsley K, Lu W, McAlinden KD, Eapen MS, Sohal SS. Smoking Upregulates Angiotensin-Converting Enzyme-2 Receptor: A Potential Adhesion Site for Novel Coronavirus SARS-CoV-2 (Covid-19). *J Clin Med* [Internet]. 2020 Mar 20;9(3). Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7141517/>.
4. Wang L, He W, Yu X, Hu D, Bao M, Liu H, et al. Coronavirus disease 2019 in elderly patients: Characteristics and prognostic factors based on 4-week follow-up. *J Infect*. 2020;80(6):639–45.

5. Middle age. In: Wikipedia [Internet]. 2020. Available from: [https://en.wikipedia.org/w/index.php?title = Middle_age&oldid=959451588](https://en.wikipedia.org/w/index.php?title=Middle_age&oldid=959451588).
6. Liu K, Chen Y, Lin R, Han K. Clinical features of COVID-19 in elderly patients: A comparison with young and middle-aged patients. *J Infect* [Internet]. 2020 Mar 27; Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7102640/>.
7. Zhu T, Wang Y, Zhou S, Zhang N, Xia L. A Comparative Study of Chest Computed Tomography Features in Young and Older Adults With Corona Virus Disease (COVID-19). *J Thorac Imaging* [Internet]. 2020 Mar 3; Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7253040/>.
8. Buckley RM. Targeting the World's Slums as Fat Tails in the Distribution of COVID-19 Cases. *J Urban Health*. 2020;1–7.
9. Hamadeh RR, Ahmed J, Al Kawari M, Bucheeri S. Smoking behavior of males attending the quit tobacco clinics in Bahrain and their knowledge on tobacco smoking health hazards. *BMC Public Health*. 2018 30;18(1):199.
10. Clements SJ, R Carding S. Diet, the intestinal microbiota, and immune health in aging. *Crit Rev Food Sci Nutr*. 2018;58(4):651–61.
11. Jin Y-H, Cai L, Cheng Z-S, Cheng H, Deng T, Fan Y-P, et al. A rapid advice guideline for the diagnosis and treatment of 2019 novel coronavirus (2019-nCoV) infected pneumonia (standard version). *Mil Med Res* [Internet]. 2020 Feb 6;7. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7003341/>.
12. Uitto J. Connective Tissue Biochemistry of the Aging Dermis: Age-Related Alterations in Collagen and Elastin. *Dermatologic Clinics*. 1986;4(3):433–46.
13. Zhu Z, Cai T, Fan L, Lou K, Hua X, Huang Z, et al. Clinical value of immune-inflammatory parameters to assess the severity of coronavirus disease 2019. *Int J Infect Dis*. 2020;95:332–9.
14. Liu K, Zhang W, Yang Y, Zhang J, Li Y, Chen Y. Respiratory rehabilitation in elderly patients with COVID-19: A randomized controlled study. *Complement Ther Clin Pract*. 2020;39:101166.
15. Michael Foster W. Mucociliary Transport and Cough in Humans. *Pulmonary Pharmacology & Therapeutics*. 2002;15(3):277–82.
16. Meng L, Qiu H, Wan L, Ai Y, Xue Z, Guo Q, et al. Intubation and Ventilation amid the COVID-19 Outbreak. *Anesthesiology* [Internet]. 2020 Apr 8; Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7155908/>.