MAK HILL Publications International Journal of Tropical Medicine

Research Article
doi: 10.59218/makijtm.2023.4.35.38

Clinical Study of the Effect of Number of Comorbidities on Outcome in Covid-19 Positive Geriatric Population in India

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ABSTRACT

Coronavirus disease 2019 (COVID-19) presents with a broad spectrum of severity. The majority of patients presenting with COVID-19 experience a mild illness that can usually be managed in the conservatively. The COVID-19 global pandemic has had an impact on every demographic, especially the elderly. Major clinical features of the disease include fever, dry cough and dyspnoea that can lead to a severe respiratory distress in some patients but also other signs and symptoms also occur. The study was conducted on 100 patients at a tertiary care hospital from November-April 2020-2022. All geriatric patients admitted in wards and ICU of dedicated COVID hospital were included in this study. Sample was collected as nasopharyngeal or oropharyngeal swab tested at tertiary care hospital, microbiology COVID lab or any other lab. After selection a complete history was obtained either from patients or relatives. A through general examination was done. Patient was subjected to biochemical investigation and radiological investigations. Investigations were done on day of admission and during the hospital stay. Finding was recorded and data was recorded in proforma. Majority of the patients were males (63%) with a male-to-female ratio of 1.70:1. Older patients with COVID-19 have higher proportion of comorbidities and the most common dual comorbidities were DM and Hypertension (21%) and DM and CKD (5%) and most single comorbidity was hypertension (15%) followed by DM (11%) IHD (9%) and COPD (5%). Sixteen patients had 3 comorbidities. In the above study it was found that older patients with COVID-19 have higher proportion of comorbidities.

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Key Words
Covid-19, old, elderly, comorbidity, geriatric

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Received: 25 November 2023
Accepted: 10 December 2023
Published: 11 December 2023

Citation: Tahir Akhtar, S. Vidya Nagar, Shefali Sangeet Shrivastava, Madhav Mahajan and Ajay Supe, 2023. Clinical Study of the Effect of Number of Comorbidities on Outcome in Covid-19 Positive Geriatric Population in India. Int. J. Trop. Med., 17: 35-38, doi: 10.59218/makijtm.2023.4.35.38

INTRODUCTION

Coronavirus disease 2019 (COVID-19) presents with a broad spectrum of severity ranging from a completely asymptomatic form to a severe acute respiratory syndrome[1]. Major clinical features of the disease include fever, dry cough and dyspnea that can lead to a severe respiratory distress in some patients but also other signs and symptoms also occur. These include muscle or body aches, anosmia, dysgeusia, headache, gastrointestinal symptoms such as diarrhea and a wide range of skin lesions such as erythematous rashes, urticaria and chicken pox-like vesicles[2-7]. Although early reports indicated that the main mechanism of transmission was respiratory through respiratory droplets exhaled by an infected person, current knowledge supports the theory that infection is spread through exposure to smaller virus-containing respiratory droplets and particles that can remain suspended in the air over long distances and tim a mechanism known as airborne transmission[8]. The COVID-19 global pandemic has had an impact on every demographic, especially the elderly. Impaired immune function as a result of immunosenescence a hallmark of frail older adults, is considered to be another key factor pre-disposing, older adults admitted to hospitals to the most severe clinical outcomes[9]. Older adults have been found to be particularly susceptible to COVID-19 infection. In comparison to younger adults, older patients have shown increased need for intensive care unit (ICU) admission and mechanical ventilation[10]. Diabetes mellitus, hypertension, cardiovascular diseases and obesity were also identified as chronic clinical conditions associated with a higher risk of all-cause mortality in older adults with COVID-19. Consistent with these data, older people with multi-morbidity (i.e. the co-occurrence of three or more chronic clinical conditions) have been proposed to be at the highest risk for developing complications and for succumbing to COVID-19[9]. The above study was conducted to observe the effect of number of comorbidities on outcome in Covid-19 positive geriatric population in India.

MATERIALS AND METHODS

Study place: The study was conducted at JJ hospital from November-April 2020-2022.

Study design: Hospital Based Retrospective Observational Study.

Inclusion criteria: Patients aged greater or equal to 60 years, RT PCR positive and ready to give informed consent.

Exclusion criteria: Patients aged less than 60 years of age, patients having Infection (Malaria, Dengue, Leptospirosis) unwilling to give consent.

Sample size: 100 patients.

Data analysis: Data was collected and graphics were designed by Microsoft Office Excel 2019. The data was analyzed with SPSS (IBM, Armonk, NY, USA) version 23.0 for Windows.

Ethical considerations: The study was conducted after obtaining permission from the Institutional Ethics Committee (IEC). Written Informed Consent (in English/Hindi/Marathi) was taken from the subjects and/or their attendants before the recruitment of the subjects in the study.

Sample was collected as nasopharyngeal or oropharyngeal swab tested at JJ hospital microbiology COVID lab or any other lab. After selection a complete history was obtained either from patients or relatives. A through general examination, nutritional history, initial symptoms, socio-economical background of the family, physical examination and systemic examination was done. Proper history was taken from the patient/relatives about their comorbidity's duration of comorbidities, number of comorbidities. Patient was subjected to biochemical investigation and radiological investigations. Investigations were done on day of admission and during the hospital stay. And finding was recorded in specially designed proforma.

RESULT

Patients had 2 comorbidities of HTN+DM followed by DM+CKD in 5 patients (5%). A single comorbidity of HTN in 15 patients (15%) DM in 11 patients (11%) IHD in 9 patients (9%) and COPD in 5 patients (5%) was observed. 3 comorbidities of DM+HTN+CVD was noted

Table 1: Distribution of patients according to gender

Gender	N = 100	Percetage
Male	63	63
Female	37	37

Majority of the patients were males (63%) with a male-to-female ratio 1.70.

Table 2: Distribution of patients according to comorbidities

Comorbidities	N = 100	Percentage
HTN	15	15
DM	11	11
IHD	9	9
COPD	5	5
HTN+DM	21	21
DM+CKD	5	5
HTN+DM+CVD	6	6
HTN+DM+IHD	6	6
Obesity	0	0
Hypothyroidism	0	021

Table 3: Distribution of patients according to number of comorbidities

Number of comorbidities	N =100	Percentage
None	18	18
One	40	40
Two	26	26
Three	16	1640

Table 4: Distribution of patients according to outcome

Outcome	N = 100	Percentage
Survivor	77	77
Non-survivor	23	23

Table 5. Association of number of comorbidities with outcome

Parameters	Survivors n = 77	Non-survivors n = 23	p-value
None	16 (20.77%)	2 (8.69%)	0.186
One	37 (48.05%)	3 (13.04%)	0.003
Two	20 (25.97%)	6 (26.09%)	0.991
Three	4 (5.19%)	12 (52.17%)	< 0.0001

Table 6. Association of number of comorbidities with outcome Sumon Ganguli *et al.*[17]

Number of comorbidities	Population (n = 1025)	Asymptomatic (n=94) (9.2%)	Mild (n = 648)(63.2%)	Moderate to severe (n = 264)(25.8%)	Critical (n = 19)(1.9%)
One	238	20(8.4%)	147(61.8%)	67(28.2%)	4(1.7%)
Two	122	3(2.5%)	70(57.4%)	47(38.5%)	2(1.6%)
Three	69	5(7.2%)	28(40.6%)	33(47.8%)	3(4.3%)
Four	24	0(0)	9(37.5%)	13(54.2%)	2(8.3%)
>Four	14	2(14.3%)	8(57.1%)	3(21.4%)	1(7.1%)

in 6 patients (6%) followed HTN+DM+IHD in 6 patients (6%) and HTN+DM+CKD in 4 patients (4%). Patients (40%) had a single comorbidity followed by two comorbidities in 26 patients (26%) While 16 patients (16%) had three comorbidities and nil comorbidity in 18 patients (18%). The survivors and non-survivors did not differ in terms of no (p = 0.186) and two (p = 0.991) comorbidities. Moreover, significantly greater proportion of survivors had one comorbidity (p = 0.003) while significantly greater proportion of non-survivors had three comorbidities (p< 0.0001). Thus, mortality increases significantly with increase in number of comorbidities. In above study, male preponderance was seen. Similar observations were noted in the study of Gulru *et al.*[11] and Sangeeta *et al.*[12] which had male preponderance. However, Ting *et al.*[13] in his study had female preponderance Table 1 and 2.

Twenty one patients had 2 comorbidities of HTN+DM followed by DM+CKD in 5 patients (5%). A single comorbidity of HTN in 15 patients (15%) DM in 11 patients (11%) IHD in 9 patients (9%) and COPD in 5 Of 100 patients, 77 (77%) survived, while 23 (23%) died. patients (5%) was observed. Three comorbidities of DM+HTN+CVD was noted in 6 patients (6%) followed HTN+DM+IHD in 6 patients (6%) and HTN+DM+CKD in 4 patients (4%). The results of our study were compared with study of following authors who observed the following. According to study done by Sangeeta *et al.*[12] the most common comorbidity was hypertension which was found in (77%) of patients. Other comorbidities such as diabetes mellitus (60.6%) obesity (35.5%) ischemic heart disease (10.4%) obstructive airway disease (5.2%) chronic liver disease (5.2%) hypothyroidism (4.3%) pulmonary Koch's (3.5%) cerebrovascular accident (3.5%) and chronic kidney disease (1.7%) were also common in study. Forty patients (17.3%) had more than one comorbidity. According to study conducted by Dai et al.[14] found that older patients with COVID-19 had relatively higher proportion of comorbidities than non-elderly patients, and the most common comorbidities were atherosclerotic cardiovascular disease (56.5%) hypertension (43.5%) and chronic pulmonary disease (21.7%). As per study conducted by Adekunle et al.[15] the most common comorbidities identified in these patients were hypertension (15.8%) cardiovascular and cerebrovascular conditions (11.7%) and diabetes (9.4%). The fewer common comorbidities were coexisting infection with HIV and hepatitis B (1.5%) malignancy (1.5%) respiratory illnesses (1.4%) renal disorders (0.8%) and immune deficiencies (0.01%). Our study found that older patients with COVID-19 have higher proportion of comorbidities and the most common dual comorbidities were DM and Hypertension (21%) and DM and CKD (5%) and most single comorbidity was hypertension (15%) followed by DM, IHD and COPD. Sixteen patients had 3 comorbidities. In above study of 100 COVID positive geriatric population. Twenty three patients (23%) died during hospital stay and rest 77 patients (77%) patients recovered and got discharged. As per study conducted by Sangeeta et al.[12] 39.8% was the mortality i.e out of 231 patients in study 91 patients succumbed and rest 138 (60.2%) survived and got discharged. Gulru et al.[11] reported mortality of 230 (26.3%) out of 873 patients in the study and rest 643 (73.7%) recovered and got discharged. Study conducted by Rosemarie et al.[16] on clinical course of COVID 19 positive patients 689 patients were studied out which 156 (22.64%) patients succumbed and rest 533 (77.35%) survived and got discharged. Results of our study is consistent with results of Sangeeta *et al.*,[12] Gulru *et al.*[15] and Rosemarie *et al.*[16]. Association of number of comorbidities with the outcome in study. Sumon *et al.*[17] conducted study association of comorbidities with the COVID-19 severity and hospitalization in Bangladesh. The above table depicts that as the number of comorbidities increases the clinical severity of individual increases which is consistent with our study findings Table 3 and 6.

CONCLUSION

In above study it was found that older patients with COVID-19 have higher proportion of comorbidities and the most common dual comorbidities were DM and Hypertension (21%) and DM and CKD (5%) and most single comorbidity was hypertension (15%) followed by DM (11%) IHD (9%) and COPD (5%). Sixteen patients had 3 comorbidities.

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