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Clinico-Laboratory Profile and Outcomes of Geriatric COVID-19 Patients in a Tertiary Healthcare Setting in Kerala

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ABSTRACT

Older adults experienced disproportionate levels of morbidity and mortality during the COVID-19 pandemic, driven by physiological senescence and multi-morbidity. This research evaluates the clinical features, biochemical markers, and survival outcomes of elderly patients within a tertiary care environment in Kerala. We conducted a retrospective, record-oriented analysis of 626 COVID-19-positive individuals (age ≥60) admitted to T.D. Medical College Hospital, Alappuzha, between June 2020 and January 2021. Statistical associations between demographics, laboratory indices, and clinical outcomes were determined using IBM SPSS version 25. The study population was mostly male (57.7%), with the majority falling in the 60–70 age bracket. Fatigue (58.6%) was the primary clinical complaint, whereas pyrexia was notably absent in many cases. Hypertension (67.3%) was the most prevalent underlying condition. A significant mortality risk was identified in Category C patients (33.9%), those with an admission SpO_2 below 90% (46.0%), and individuals with pre-existing cardiac disease. High ESR, D-dimer, and ferritin levels, along with sodium and potassium imbalances, served as robust predictors of mortality. Conversely, standard antiviral and corticosteroid therapies did not show a correlation with improved survival in this specific cohort. COVID-19 in the elderly frequently presents with non-classical symptoms, complicating early detection. Management should prioritize the monitoring of inflammatory markers and electrolyte levels, as conventional pharmacotherapy demonstrated limited benefit in this demographic.

Keywords: Geriatric COVID-19, Clinical Profile, Laboratory Markers, Kerala, Mortality, Comorbidities.

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INTRODUCTION

The global health landscape was fundamentally reshaped by the late 2019 outbreak of SARS-CoV-2, which placed an unprecedented strain on medical infrastructures [1]. Among the various demographics affected, elderly individuals emerged as the most susceptible group [2]. This heightened vulnerability is primarily driven by the intersection of physiological senescence and a high density of chronic health conditions [3].

Advanced age remains a primary determinant for poor clinical outcomes and in-hospital mortality [4]. However, the clinical presentation in geriatric patients is often non-classical, frequently lacking hallmark indicators such as fever, which can result in significant diagnostic delays[5]. Despite the vast literature on the pandemic, specific insights into the clinico-laboratory markers of the elderly in the Kerala region remain limited. This research addresses this gap by analyzing the clinical characteristics and therapeutic results of geriatric patients in a tertiary care environment.

MATERIALS AND METHOD

Study Design and Participants

This research utilized a retrospective, record-oriented approach to examine 626 confirmed COVID-19 cases among individuals aged 60 and older. The cohort was admitted to T.D. Medical College Hospital, Alappuzha, during the period spanning June 2020 to January 2021.

Data Collection

Comprehensive data points were gathered, including patient demographics, neurological symptoms [6], and relevant diagnostic imaging [7]. Clinical severity was graded using the three-tier (Category A, B, C) system established by the Kerala Health and Welfare Department.

Statistical Analysis

Quantitative analysis was performed via IBM SPSS version 25. The study utilized frequencies for categorical data and applied Chi-square testing to determine associations between clinical variables and survival outcomes (significance set at $p < 0.05$).

RESULTS AND DISCUSSION

Demographics and Symptomatology

The study population showed a male predominance (57.7%), a finding consistent with international observations suggesting that gender-based biological differences influence viral susceptibility [8]. A significant observation was the high mortality within the 60–70 age bracket, which may reflect specific demographic trends and vaccination gaps during the study's timeframe [9].

Table 1

	Ranges	Cured	Expired	Total	p-Value
Age Category	60 - 70 years	197 (77.6%)	57 (22.4%)	254	0.185
	70 - 80 years	172 (80.8%)	41 (19.2%)	213	
	>80 years	135 (84.9%)	24 (15.1%)	159	
Gender	Male	300 (81.5%)	68 (18.5%)	368	0.446
	Female	204 (79.1%)	54 (20.9%)	258	
Occupation	Professional	4 (100%)	0 (0%)	4	0.620
	Manual Labourer	5 (71.4%)	2 (28.6%)	7	
	Homemaker	194 (79.2)	51 (20.8%)	245	
	Retired	301 (81.4%)	69 (18.6%)	370	

Clinical presentations often deviated from standard expectations [10]. Notably, fatigue outpaced fever as the primary symptom, with the latter appearing in only 36.3% of the cohort. This lack of febrile response is a significant clinical hurdle that can impede early intervention [11]. Furthermore, sensory deficits were infrequently reported, likely obscured by baseline age-related sensory changes.

Comorbidities and Severity

Hypertension (67.3%) and diabetes were the most prevalent underlying conditions. The data demonstrated a strong correlation between mortality and a history of cerebrovascular or coronary artery disease [12]. This reinforces the hypothesis that COVID-19 intensifies pre-existing microvascular fragility and systemic inflammation.

Table 2

	Ranges	Cured	Expired	Total	P value
Diabetes	Absent	233 (80.6%)	56 (19.4%)	289	0.948
	Present	271 (80.4%)	66 (19.6%)	337	
HTN	Absent	142 (73.6%)	51 (26.4%)	193	0.003
	Present	362 (83.6%)	71 (16.4%)	433	
CAD	Absent	366 (84.1%)	69 (15.9%)	435	0.001
	Present	138 (72.3%)	53 (27.7%)	191	
Asthma	Absent	482 (80.7%)	115 (19.3%)	597	0.517
	Present	22 (75.9%)	7 (24.1%)	29	
COPD	Absent	450 (80.8%)	107 (19.2%)	557	0.617
	Present	54 (78.3%)	15 (21.7%)	69	
CKD	Absent	422 (81.6%)	95 (18.4%)	517	0.126
	Present	82 (75.2%)	27 (24.8%)	109	
CVA	Absent	454 (81.7%)	102 (18.3%)	556	0.042
	Present	50 (71.4%)	20 (28.6%)	70	
DLP	Absent	366 (79.9%)	92 (20.1%)	458	0.532
	Present	138 (82.1%)	30 (17.9%)	168	
Malignancy	Absent	463 (80.5%)	112 (19.5%)	575	0.982
	Present	41 (80.4%)	10 (19.6%)	51	

Laboratory Markers and Vitals

An admission SpO_2 of less than 90% served as a major red flag, correlating with a 46% mortality rate [13]. Prognostic accuracy was further enhanced by monitoring markers such as D-dimer, ferritin, and ESR [14]. Additionally, electrolyte disturbances—specifically deviations in sodium and potassium—were linked to fatal outcomes. Interestingly, while non-survivors often displayed neutrophilia [15], a standard leukocyte count did not guarantee a favorable recovery.

Table 3: Association of Laboratory Parameters with Clinical Outcomes

Laboratory Parameter	Ranges	Cured (n=504)	Expired (n=122)	Total (n=626)	P-Value
Hb	>14.5	27 (81.8%)	6 (18.2%)	33	0.803
	12 - 14.5	270 (78.9%)	72 (21.1%)	342	
	10 - 12	150 (83.3%)	30 (16.7%)	180	
	7 - 10	51 (79.7%)	13 (20.3%)	64	
	<7	6 (85.7%)	1 (14.3%)	7	
TLC	<4000	47 (92.2%)	4 (7.8%)	51	< 0.001
	4000 - 11000	371 (82.4%)	79 (17.6%)	450	
	>11000	86 (68.8%)	39 (31.2%)	125	
DLC	Neutrophilic	416 (85.2%)	72 (14.8%)	488	< 0.001
	Lymphocytic	88 (63.8%)	50 (36.2%)	138	
ESR	0 - 20	12 (100.0%)	0 (0.0%)	12	< 0.001
	20 - 50	39 (39.0%)	61 (61.0%)	100	
	50 - 100	20 (38.5%)	32 (61.5%)	52	
Na	< 135	65 (51.6%)	61 (48.4%)	126	< 0.001
	135 - 145	329 (85.7%)	55 (14.3%)	384	
	> 145	110 (94.8%)	6 (5.2%)	116	
K	< 3.5	46 (46.0%)	54 (54.0%)	100	< 0.001
	3.5 - 5.5	429 (87.4%)	62 (12.6%)	491	
	> 5.5	29 (82.9%)	6 (17.1%)	35	
SGOT	< 40	414 (86.4%)	65 (13.6%)	479	< 0.001
	40 - 300	86 (61.0%)	55 (39.0%)	141	
	300 - 1000	4 (66.7%)	2 (33.3%)	6	
SGPT	< 40	403 (86.1%)	65 (13.9%)	468	< 0.001
	40 - 300	97 (63.8%)	55 (36.2%)	152	
	300 - 1000	4 (66.7%)	2 (33.3%)	6	
ALP	<= 130	484 (83.2%)	98 (16.8%)	582	< 0.001
	> 130	20 (45.5%)	24 (54.5%)	44	
hsCRP	< 5	40 (42.1%)	55 (57.9%)	95	0.863
	>= 5	33 (43.4%)	43 (56.6%)	76	
Ferritin	< 300	240 (78.2%)	67 (21.8%)	307	< 0.001
	>= 300	76 (58.0%)	55 (42.0%)	131	
D Dimer	< 1000	54 (100.0%)	0 (0.0%)	54	< 0.001

Treatment Outcomes

The mortality rate for patients requiring intensive care reached 67.5% [13]. Within this specific geriatric population, the use of standard antivirals and antibiotics did not demonstrate a clear survival benefit. Paradoxically, those treated with corticosteroids exhibited higher mortality,

aligning with recent evidence suggesting that steroid efficacy may be diminished or counterproductive in certain elderly sub-populations [16].

CONCLUSION

Diagnosing COVID-19 in the elderly remains complex due to the prevalence of atypical clinical signs [5]. This study underscores the importance of utilizing inflammatory markers and electrolyte monitoring as primary prognostic tools in geriatric care.

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