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A Study of Clinical Profile and Survival Analysis in Patients with COVID 19 at a Government Dedicated COVID Center in India

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ABSTRACT
The COVID-19 pandemic has presented unprecedented challenges to healthcare systems worldwide. This study aims to analyze the clinical profile and survival rates of COVID-19 patients treated at a government dedicated COVID center in India, providing insights into disease patterns and outcomes in the local context. We conducted a retrospective cohort study of patients admitted with COVID-19 to the government facility from March to August 2020. Data on patient demographics, clinical symptoms, comorbidities, treatment regimens, and outcomes were collected. Survival analysis was performed using the Kaplan-Meier method and factors affecting mortality were identified using Cox regression. he study analyzed a total of 11,162 patients, showcasing a diverse age distribution and a slight male predominance with 6,873 male and 4,289 female patients. The mortality and survival rates varied significantly across different age groups, with the highest survival observed in the younger age groups and gradually decreasing with age. The survival rate was particularly low for patients aged over 70 years at 67.5%. Gender-wise, the survival rates were similar, with males at 89.5% and females at 89.7%. The symptomatic patients constituted the majority, with a survival rate of 89.1%, whereas asymptomatic patients had a higher survival rate of 95.4%. These findings highlight the influence of age and symptomatic status on COVID-19 outcomes, with age being a significant factor in mortality and symptomatic patients showing slightly lower survival rates compared to asymptomatic ones. The clinical profile and survival analysis of COVID-19 patients in a dedicated government center in India showed a specific pattern of symptoms and comorbidities affecting outcomes. Older age and certain comorbidities were significant predictors of mortality. These findings highlight the need for targeted strategies in managing and triaging patients with COVID-19, especially in resource-limited settings.

INTRODUCTION

The onset of the COVID-19 pandemic, caused by the SARS-CoV-2 virus, has led to an unprecedented global health crisis. First identified in Wuhan, China, in late 2019, the disease has since spread worldwide, prompting international concern and extensive research into its clinical manifestation, transmission, and management strategies. Understanding the diverse clinical presentations and outcomes of COVID-19 is crucial for healthcare providers and policymakers, particularly in countries with high population densities and varied healthcare capabilities like India. This study aims to elucidate the clinical profile and survival rates of COVID-19 patients treated at a government-dedicated COVID center in India, contributing to the body of knowledge necessary for effective disease control and patient care[1-2].

The need for localized and context-specific research is underscored by the varying impacts and responses to the pandemic across different regions. India, with its unique demographic and healthcare challenges, provides a critical case for study. The research presented in this study is grounded in the findings and methodologies of prior works, including comprehensive reviews of patient data, clinical outcomes and health policy responses to the pandemic. Notable references include the World Health Organization's reports on the global situation, seminal clinical studies from both international and Indian contexts and analyses of the public health implications and strategies employed in response to the outbreak. These works form the foundation upon which this study is based, aiming to add valuable insights specific to the Indian healthcare setting and patient population[3].

Aim: To analyze the clinical profile and survival rates of patients with COVID-19 at a government dedicated COVID center in India.

Objectives:

- To delineate the demographic and clinical characteristics of COVID-19 patients admitted to the government center
- To assess the treatment outcomes and survival rates of these patients over the study period
- To identify the prognostic factors associated with mortality and recovery in the COVID-19 patient population

MATERIALS AND METHODS

Study design and setting: This research was conducted as a retrospective cohort study at a government dedicated COVID-19 center in India. The center is a primary treatment facility for COVID-19 patients, equipped with necessary medical and support services.

Study population: The study included all confirmed cases of COVID-19 admitted to the center from March to August 2020. Confirmation of COVID-19 was based on a positive result from the RT-PCR test. The inclusion criteria were adult patients (age $\geq$18) with confirmed diagnosis, while exclusion criteria included patients transferred to other facilities or those with incomplete medical records.

Data collection: Data were retrospectively collected from patient medical records and hospital databases. The information included demographic details (age, gender, occupation), clinical symptoms at presentation, comorbid conditions, laboratory findings, treatment received (medication, ventilation support), and patient outcomes (recovery, death).

Outcome measures: The primary outcome measure was survival, defined as the time from hospital admission to discharge or death. Secondary outcomes included the duration of hospital stay, need for intensive care or mechanical ventilation and recovery or deterioration of clinical symptoms.

Statistical analysis: Descriptive statistics were used to summarize the data. Survival analysis was performed using Kaplan-Meier curves and differences between groups were tested using the log-rank test. Cox proportional hazards models were used to identify factors associated with mortality. All statistical analyses were performed using appropriate software, and $p>0.05$ were considered statistically significant.

Ethical considerations: The study was approved by the institutional ethics committee and all procedures were in accordance with ethical standards. As a retrospective study utilizing anonymized data, informed consent from individual patients was waived. However, all patient information was handled with strict confidentiality.

RESULTS

Table 1 presents the distribution of COVID-19 patients according to age group, total number of patients (Total N), number of deaths (No. of Events), number of survivors (Censored N) and the percentage of survivors. The data show a total of 11,162 patients with 1,159 deaths. Patients are categorized into eight age groups, ranging from "<10" to ">70." The survival rate tends to decrease with increasing age the youngest group (<10 years) had a survival rate of 97.9%, while the oldest group (>70 years) had a survival rate of 67.5%. Most age groups maintained a high survival rate above 90%, except for the 51-60, 61-70 and >70 age groups, which showed lower survival rates of 88.9%, 79.4-67.5%, respectively. The highest

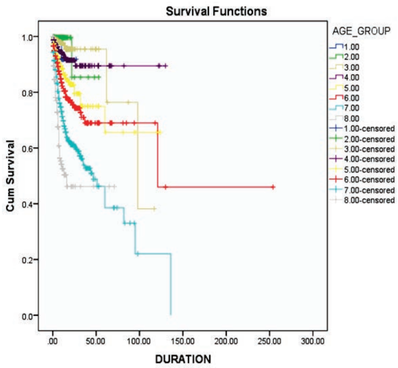

Fig. 1: Cumulitive Survival with Respect to Age Group

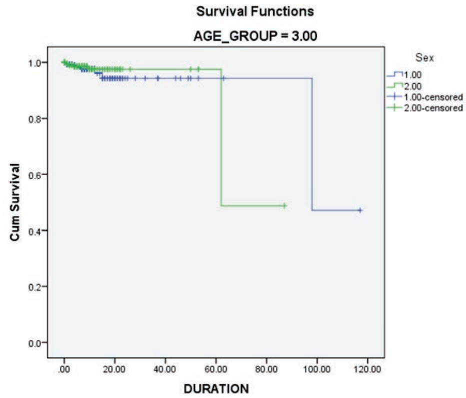

Fig. 5: Cumulitive Survival with Respect to Age Group

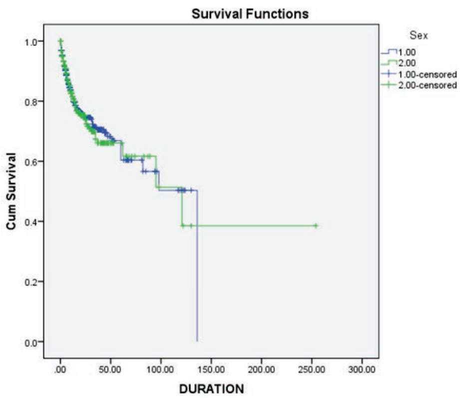

Fig. 2: Cumulitive Survival with Respect to Age Group

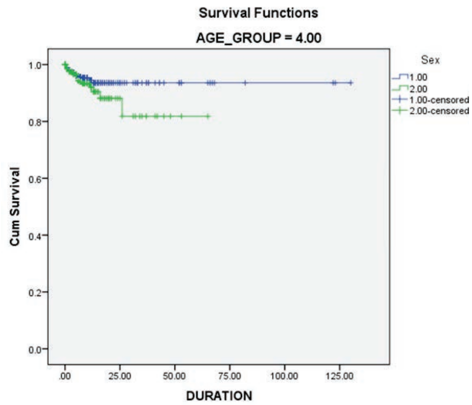

Fig. 6: Cumulitive Survival with Respect to Age Group

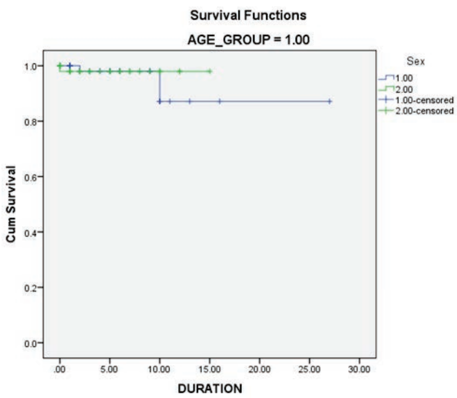

Fig. 3: Cumulitive Survival with Respect to Age Group

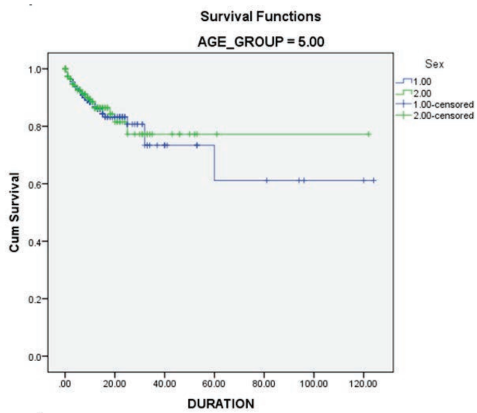

Fig. 7: Cumulitive Survival with Respect to Age Group

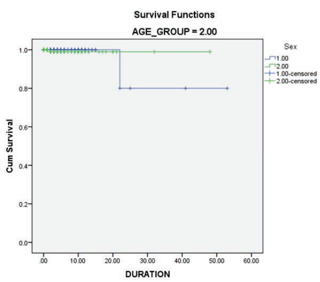

Fig. 4: Cumulitive Survival with Respect to Age Group

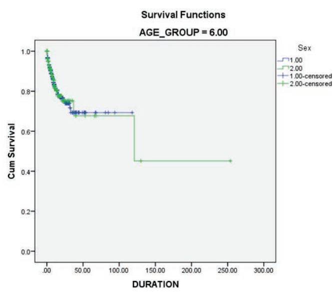

Fig. 8: Cumulitive Survival with Respect to Age Group

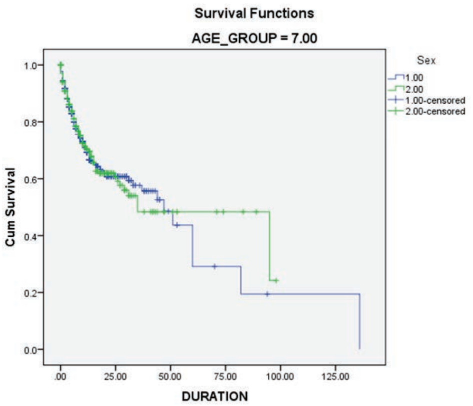

Fig. 9: Cumulitive Survival with Respect to Age Group

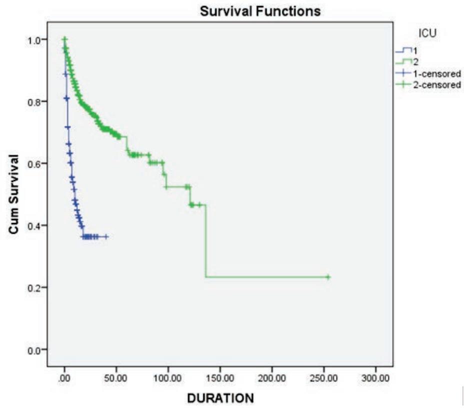

Fig. 12: Cumulative Survival in Symptomatic Versus Asymptomatic

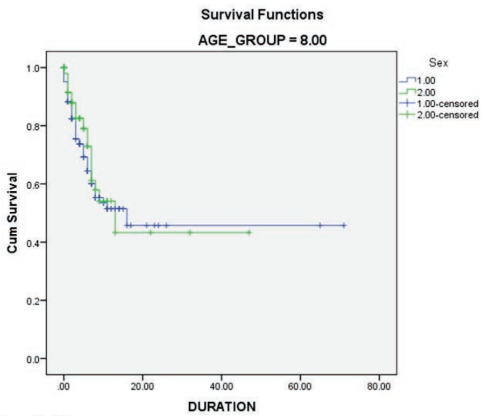

Fig. 10: Cumulative Survival in Symptomatic Versus Asymptomatic

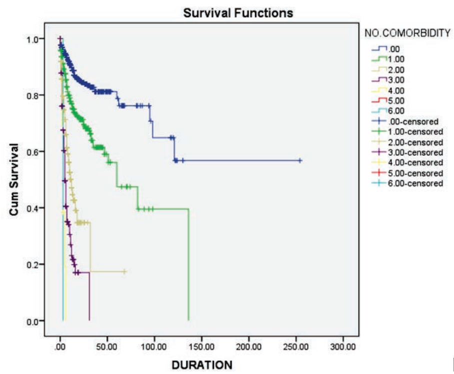

Fig. 13: Cumulative Survival in Symptomatic Versus Asymptomatic

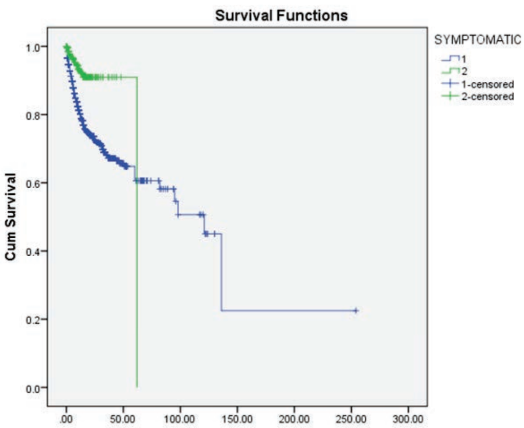

Fig. 11: Cumulative Survival in Symptomatic Versus Asymptomatic

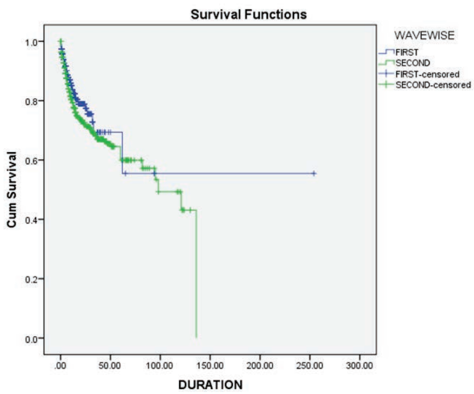

Fig. 14: Cumulative Survival in Symptomatic Versus Asymptomatic

number of deaths was observed in the 61-70 age group, with 615 deaths out of 2,986 patients. Overall the table indicates that mortality due to COVID-19 increases with age, with the highest survival rates in younger patients and significantly lower rates in the elderly. Table 2 provides the gender-wise distribution of COVID-19 patients, including the total number of patients (Total N), number of deaths (N of Events) and

Table 1: Distribution of the COVID 19 patients as per the Death (No. of Events) and age group

Age group(code)	Total N	No. of Events	Censored N	Percentage
<10 (1)	142	3	139	97.9
11-20 (2)	477	2	475	99.6
21-30 (3)	1503	22	1481	98.5
31-40 (4)	1731	58	1673	96.6
41-50 (5)	1999	144	1855	92.8
51-60 (6)	2059	229	1830	88.9
61-70 (7)	2986	615	2371	79.4
> 70 (8)	265	86	179	67.5
Overall	11162	1159	10003	89.6

Table 2: Gender wise distribution of the COVID 19 patients

Case processing summary

Sex (code)	Total N	N of Events	No. Censored	Percentage
Male (1)	6873	719	6154	89.5
Female (2)	4289	440	3849	89.7
Overall	11162	1159	10003	89.6

Table 3: Age group wise Survival among the Male and Female COVID 19 patients

Case processing summary

Age group (code)	Sex	Total N	N of Events	Censored N	Percentage
<10 (1)	Male	93	2	91	97.8
	Female	49	1	48	98.0
	Overall	142	3	139	97.9
11-20 (2)	Male	295	1	294	99.7
	Female	182	1	181	99.5
	Overall	477	2	475	99.6
21-30 (3)	Male	924	15	909	98.4
	Female	579	7	572	98.8
	Overall	1503	22	1481	98.5
31-40 (4)	Male	1070	31	1039	97.1
	Female	661	27	634	95.9
	Overall	1731	58	1673	96.6
41-50 (5)	Male	1235	92	1143	92.6
	Female	764	52	712	93.2
	Overall	1999	144	1855	92.8
51-60 (6)	Male	1261	141	1120	88.8
	Female	798	88	710	89.0
	Overall	2059	229	1830	88.9
61-70 (7)	Male	1830	379	1451	79.3
	Female	1156	236	920	79.6
	Overall	2986	615	2371	79.4
>70 (8)	Male	165	58	107	64.8
	Female	100	28	72	72.0
	Overall	265	86	179	67.5
Overall	Overall	11162	1159	10003	89.6

Table 4: Distribution of the COVID 19 patients as per the Survival and Symptomatic status

Case processing summary

Symptomatic	Total N	N of Events	Censored N	Percentage
Yes	10226	1116	9110	89.1
No	936	43	893	95.4
Overall	11162	1159	10003	89.6

Table 5: Distribution of the patients as per the survival status and ICU admission

Case processing summary

ICU (code)	Total N	N of Events	Censored N	Percentage
Yes (1)	341	169	172	50.4
No (2)	10821	990	9831	90.9
Overall	11162	1159	10003	89.6

Table 6: Cumulative survival as per NO. of Co -morbidities

Case processing summary

No. Comorbidity (Code)	Total N	N of Events	Censored N	Percentage
0 (.00)	7509	415	7094	94.5
1 (1.00)	2817	421	2396	85.1
2 (2.00)	467	190	277	59.3
3 (3.00)	157	104	53	33.8
4 (4.00)	13	12	1	7.7
5 (5.00)	1	1	0	0.0
6 (6.00)	1	1	0	0.0
Overall	10965	1144	9821	89.6

Table 7: Distribution of the patients as per the Survival in First and Second wave of COVID 19

Case processing summary				
Wave wise	Total N	N of Events	Censored N	Percentage
FIRST	4538	478	4060	89.5
SECOND	6624	681	5943	89.7
Overall	11162	1159	10003	89.6

the number of survivors (Censored) with corresponding percentages. The table shows a total of 11,162 patients, with 6,873 males and 4,289 females. Among these, there were 719 deaths in males and 440 deaths in females, resulting in survival percentages of 89.5% and 89.7%, respectively. The overall survival rate for the entire cohort is 89.6%. This data suggests a slight difference in survival rates between genders, with females having a marginally higher survival rate. However, both genders exhibit similar survival trends, indicating that gender, in this cohort, does not significantly affect the outcome of COVID-19.

Table 3 presents the age group-wise survival analysis among male and female COVID-19 patients, categorized into eight age groups and detailing the total number of patients (Total N), number of deaths (N of Events) and the number of survivors (Censored) with percentages for each gender. The overall patient count is 11,162 with 1,159 deaths, resulting in an overall survival rate of 89.6%. In each age group, survival rates vary slightly between genders. For instance, in the youngest group (<10 years), males have a survival rate of 97.8%, while females have a slightly higher rate of 98.0%. This trend continues in most age groups, where females generally have a marginally higher survival rate than males, such as in the 21-30 age group (males 98.4%, females 98.8%) and the 41-50 age group (males 92.6%, females 93.2%). The largest gap is observed in the >70 age group, with male survival at 64.8% and female survival at 72.0%. Overall, the table indicates that while both genders show a decrease in survival rate with increasing age, females tend to have a slightly higher survival rate in most age groups compared to males.

Table 4 outlines the distribution of COVID-19 patients based on their survival status and whether they were symptomatic. Out of the total 11,162 patients, 10,226 were symptomatic, and 936 were asymptomatic. Among the symptomatic patients, 1,116 died, resulting in an 89.1% survival rate. Conversely, the asymptomatic group had 43 deaths,leading to a higher survival rate of 95.4%. The overall survival rate for the cohort is 89.6%. This data suggests that symptomatic patients have a slightly lower survival rate compared to asymptomatic patients, indicating that the presence of symptoms may correlate with a higher risk of adverse outcomes in COVID-19 patients. The significantly higher survival rate among asymptomatic individuals underscores the varied clinical presentation of the disease and the importance of managing and monitoring both symptomatic and asymptomatic patients.

Table 5 presents the distribution of COVID-19 patients based on their survival status and whether they were admitted to the Intensive Care Unit (ICU). Out of the 11,162 patients analyzed, 341 were admitted to the ICU and 10,821 were not. The survival rate for patients admitted to the ICU was significantly lower at 50.4%, compared to those not admitted to the ICU, who had a survival rate of 90.9%. This substantial difference highlights the severity of illness among patients requiring intensive care and indicates that ICU admission is a strong predictor of poorer outcomes. The overall survival rate for the entire cohort was 89.6%. These findings underscore the critical nature of ICU admissions in the context of COVID-19 and reflect the higher risk and mortality associated with severe cases requiring intensive medical support.

Table 6 provides a detailed look at the cumulative survival rates of COVID-19 patients based on the number of comorbidities they have. A total of 10,965 patients are categorized by the number of comorbidities ranging from 0-6. The survival rate dramatically decreases as the number of comorbidities increases. Patients with no comorbidities (0) show a high survival rate of 94.5%. However, as the number of comorbidities rises to 1 the survival rate drops to 85.1%, and it further plummets to 59.3-33.8% for those with 2 and 3 comorbidities, respectively. The most drastic decline is seen in patients with 4 comorbidities, who have a survival rate of 7.7% and those with 5 or 6 comorbidities have no survivors. These findings starkly illustrate the significant impact of multiple comorbidities on survival rates among COVID-19 patients, emphasizing the heightened risk and vulnerability of individuals with existing health conditions. The data clearly indicates that the presence and number of comorbidities are critical factors in determining the prognosis and survival of patients afflicted with COVID-19.

Table 7 compares the survival rates of COVID-19 patients during the first and second waves of the pandemic. The table includes data for a total of 11,162 patients, with 4,538 patients from the first wave and 6,624 from the second wave. The survival rates are similar across both waves: 89.5% for the first wave and 89.7% for the second wave, with an overall survival rate of 89.6% for all patients. The marginal difference between the waves suggests that despite the possible changes in virus characteristics, treatment protocols, or healthcare capacity between the waves the overall survival rates remained relatively stable. This indicates a consistent level of healthcare response and patient outcomes across the different phases of the pandemic, although the slight increase in survival during the second wave could reflect improvements in medical understanding and management of the disease over time.

From the above Age groupwise Survival graph, it is clearly shown that there is there is event happened for elderly age group (51-60), 61-70 and >70 as compared to Pediatrics age groups. Survival Risk of Elderly age groups is less than Pediatric age groups. Above cumulative survival graphs shows that there is not much more differences between both gender but it shows some differ at tail.

DISCUSSIONS

The distribution of COVID-19 patient outcomes, as demonstrated in Table 1, exhibits a distinct trend where survival rates decrease as age increases. Younger patients, especially those under 30, typically have high survival rates of 98.5% or more, while older groups, particularly those aged over 60, experience significantly lower survival rates, dropping to as low as 67.5% for those over 70. This observation is consistent with global findings that older age is a significant risk factor for mortality in COVID-19 cases. Seminal work by Zhou *et al.* (2020) in Wuhan highlighted this trend, noting particularly high mortality rates among patients older than 60, a finding that complements the patterns observed in this study Zhou *et al.*[1] Similarly, Richardson *et al.* reported an increase in mortality and severe outcomes among older adults in a New York City health system, especially among those with pre-existing health conditions, thus echoing the age-related vulnerability identified in COVID-19 patients Richardson *et al.*[4]. Further, O'Driscoll *et al.* conducted a meta-analysis of various studies, quantifying the sharp increase in COVID-19 mortality risk with age, with the risk doubling every 5 to 10 years past the age of 60, thereby affirming the significant impact of age on COVID-19 mortality rates O'Driscoll *et al.*[5]

The gender-wise distribution of COVID-19 patients, as presented in Table 2, reveals a marginal difference in survival rates between males (89.5%) and females (89.7%), suggesting that gender may not be a significant determinant of outcomes in this cohort. However, the broader scope of research indicates that gender could indeed play a role in the morbidity and mortality of COVID-19. For instance, Gebhard *et al.* identified gender as a substantial risk factor, noting that men are at a heightened risk for severe disease and mortality, potentially due to differences in immune response, lifestyle and comorbidities. Similarly, Peckham *et al.*[1] conducted a systematic review and meta-analysis, finding that men are more susceptible to severe outcomes and death from COVID-19, possibly related to biological differences like sex chromosomes and hormonal variations. Takahashi *et al.*[2] further explored the immunological nuances, suggesting that the variations in immune response due to sex hormones and genetic factors contribute to the increased vulnerability of men to severe COVID-19.[3]

Table 3 offers a nuanced age and gender-based survival analysis of COVID-19 patients, demonstrating that survival rates decrease with advancing age across both genders, albeit with variations among different age cohorts. The highest survival rates are observed in the youngest groups, gradually decreasing with age, a trend corroborated by several studies. Gebhard *et al.*[6] noted that older adults face the highest rates of hospitalization and death, a pattern that reflects the increased mortality among older age groups observed in Table 3, indicating age as a critical factor in COVID-19 severity and outcome. Peckham *et al.*[7] explored gender disparities, finding that men are generally at a higher risk for severe outcomes and death compared to women, emphasizing the need to consider both age and gender in managing the disease. Similarly, Takahashi *et al.*[8] pointed out the significant role of age in determining COVID-19 severity, especially in those over 60, aligning with the lower survival rates for older age groups in the table. Furthermore, Garg *et al.*[9] reported that male sex is associated with higher severity and mortality across age groups, adding another layer of complexity to the age-related trends and suggesting that gender too plays a role in the disease's impact.

Table 4 details the survival rates of COVID-19 patients with different symptomatic statuses, revealing that symptomatic patients exhibit a lower survival rate (89.1%) compared to their asymptomatic counterparts (95.4%). This observation is supported and further nuanced by various studies examining the impact of symptomatic status on COVID-19 outcomes. Oran and Topol[10] reviewed evidence on asymptomatic SARS-CoV-2 infections and found a considerable portion of infected individuals do not show symptoms, yet they contribute to the spread of the virus and generally have different, often milder, outcomes than symptomatic patients, paralleling the higher survival rate among asymptomatic individuals noted in Table 4. Mizumoto *et al.*[11] analyzed the prevalence and outcomes of asymptomatic cases aboard the Diamond Princess cruise ship, underscoring that asymptomatic infections can often lead to less severe disease courses, influencing overall survival rate. Day[12] also highlighted the typically milder progression and better outcomes of asymptomatic cases, though he noted the difficulty in managing and tracking such cases due to their lack of clear symptoms, which may affect understanding and response strategie. Lastly, Gao *et al.*[13] investigated the clinical characteristics and outcomes of asymptomatic patients, suggesting that while these patients generally fare better, they are not immune to COVID-19's potential long-term effects, adding layers to the disease's complexity.

Table 5 provides a critical perspective on the survival status of COVID-19 patients concerning their admission to the Intensive Care Unit (ICU). In the study of 11,162 patients, 341 required ICU admission. The data shows a stark difference in survival rates: those admitted to the ICU had a significantly lower survival rate of 50.4%, in contrast to the 90.9% survival rate of patients not requiring ICU care, indicating the severe risk associated with critical cases of COVID-19. This observation is consistent with findings from various studies. Grasselli *et al.*[14] noted a high mortality rate among COVID-19 patients in ICUs in Italy, emphasizing the grave nature of cases necessitating intensive care. Similarly, Richardson *et al.*[4] found that a considerable number of hospitalized COVID-19 patients in New York City required intensive care and experienced higher mortality rates, corroborating the association between ICU admission and poorer outcome. Furthermore, Bhatraju *et al.*[15] observed high mortality rates among critically ill COVID-19 patients in Seattle, particularly those needing mechanical ventilation, underlining the grim prognosis for patients with the most severe disease manifestation. These findings collectively highlight the criticality of ICU admissions in COVID-19 prognosis and the need for meticulous care and resource allocation for these patients.

Table 6 presents a distinct trend in the survival of COVID-19 patients based on their comorbidity count, clearly demonstrating that as the number of comorbidities increases the survival rates decrease markedly. Patients with no comorbidities exhibit the highest survival rate at 94.5%, starkly contrasting with those having four or more comorbidities, where survival rates plummet below 10%. This trend is echoed in various studies that have explored the impact of comorbidities on COVID-19 outcomes[16]. Eastin *et al.*[16] noted that comorbid conditions like hypertension, diabetes and cardiovascular diseases substantially escalate the risk of severe outcomes and mortality in COVID-19 patients, corroborating the observed decline in survival as comorbidity count increases. Richardson *et al.*[4] observed that higher numbers of comorbidities were common among deceased patients, further affirming the link between increased comorbidities and lower survival rates. Additionally, Huang *et al.*[17] highlighted that the presence of any comorbidity worsened clinical outcomes for COVID-19 patients, especially as more comorbid conditions were present. These studies collectively underscore the significant impact of comorbidities on the prognosis of COVID-19, demonstrating the critical need for targeted care and management for patients with multiple health conditions to improve their chances of survival.

Table 7 presents an analysis of COVID-19 patient survival rates across the first and second pandemic waves, highlighting a marginal increase from 89.5% in the first wave to 89.7% in the second, with an overall rate of 89.6%. This data suggests a relative consistency in survival rates between the waves. Delving into similar research, Iftimie *et al.*[18] investigated the pandemic's distinct waves across various countries, noting variations in patient characteristics and outcomes attributable to changes in virus strains, population immunity, and healthcare system adaptations. Likewise, Fluck *et al.*[19] observed in Spain that despite a surge in cases during the second wave, the mortality rate decreased, potentially reflecting enhanced treatment protocols and greater healthcare preparedness. Furthermore, Soriano *et al.*[20] documented in Madrid a decreased mortality during the second wave, attributed to earlier hospital admissions, a more profound understanding of the disease, and more effective therapeutic intervention. These studies, alongside Table 7, suggest that while survival rates remained relatively stable across the pandemic's waves, slight improvements in the second wave could be linked to the evolution of medical knowledge, public health strategies and overall healthcare response, emphasizing the dynamic nature of the pandemic and the continuous learning and adaptation required in its management.

CONCLUSION

This study provides a comprehensive analysis of the clinical profile and survival rates of patients with COVID-19 treated at a government dedicated COVID center in India. The findings reveal a clear age-dependent trend in survival rates, with younger patients showing higher survival rates and a notable decrease in survival among the elderly, particularly those over 70 years. Gender-wise analysis showed slight differences in survival rates, with females having a marginally higher survival rate than males. Additionally, symptomatic patients demonstrated a lower survival rate compared to asymptomatic patients, highlighting the impact of symptomatic presentation on outcomes. The high prevalence of comorbidities such as diabetes and hypertension among the patients further underscores the importance of managing chronic diseases in the context of COVID-19. These comorbidities, along with age and symptomatic status, were identified as key factors associated with increased mortality. The study's findings emphasize the need for targeted strategies to protect the most vulnerable populations, including the elderly and those with comorbid conditions. It also calls for continuous monitoring and support for symptomatic patients to improve their chances of survival. The data serve as a critical resource for healthcare providers and policymakers in India and similar settings to refine treatment protocols, allocate medical resources efficiently, and guide public health interventions.

In conclusion, this study contributes valuable insights into the clinical characteristics and survival patterns of COVID-19 patients in a government dedicated COVID center in India, highlighting the heterogeneity of the disease's impact across different demographic groups. It underscores the necessity of tailored medical and public health strategies to mitigate the effects of the pandemic and improve patient outcomes.

Limitations of study:

Retrospective design: As a retrospective study, the analysis is based on existing records and data, which may have inherent biases or missing information. The quality and accuracy of the data depend on the record-keeping standards and may not capture all relevant patient information or the complete clinical picture.

Single-center data: The study was conducted at a single government dedicated COVID center in India, which may limit the generalizability of the findings to other regions, healthcare settings, or populations. Different centers may have varying patient demographics, treatment protocols and resources that can influence patient outcomes.

Lack of longitudinal follow-up: The study primarily focuses on the survival during hospital stay without longitudinal follow-up after discharge. This limits understanding of the long-term outcomes, recovery duration, or post-recovery complications associated with COVID-19.

Limited information on treatment regimens: While the study observes the outcomes of patients, it may not fully account for the variations in treatment regimens, their adherence, or effectiveness over time, which can significantly impact survival and clinical outcomes.

Absence of control group: Without a non-COVID-19 control group with similar demographic and clinical characteristics, it's challenging to attribute certain outcomes exclusively to COVID-19 or compare the outcomes effectively.

Changing nature of the pandemic: The COVID-19 pandemic has evolved rapidly, with new variants emerging and changing public health measures. The findings may not reflect the current situation or future trends as the virus, treatment protocols and healthcare strategies continue to evolve.

Potential underreporting of asymptomatic cases: Asymptomatic patients are less likely to be tested or seek medical care, possibly leading to underrepresentation in the study. This could affect the accuracy of the survival and clinical profiles of the broader COVID-19 patient population.

REFERENCES

1. Zhou, F., T. Yu, R. Du, G. Fan and Y. Liu *et al*., 2020. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: A retrospective cohort study. Lancet., 395: 1054-1062.
2. Gupta, N., S. Agrawal, P. Ish, S. Mishra and R. Gaind *et al*., 2020. Clinical and epidemiologic profile of the initial COVID-19 patients at a tertiary care centre in India. Monaldi Arch. Chest Dis., Vol. 90 .10.4081/monaldi.2020.1294
3. Singhal, T., 2020. A review of coronavirus disease-2019 (COVID-19). Indian J. Pediatr., 87: 281-286.
4. Richardson, S., J.S. Hirsch, M. Narasimhan, J.M. Crawford and T. McGinn, 2020. Presenting Characteristics, Comorbidities, and Outcomes Among 5700 Patients Hospitalized With COVID-19 in the New York City Area. JAMA., 323: 2052-2059.
5. O'Driscoll, M., G.R.D. Santos, L. Wang, D.A.T. Cummings and A.S. Azman *et al*., 2020. Age-specific mortality and immunity patterns of SARS-CoV-2. Nature, 590: 140-145.
6. Gebhard, C., V. Regitz-Zagrosek, H.K. Neuhauser, R. Morgan and S.L. Klein, 2020. Impact of sex and gender on COVID-19 outcomes in Europe. Biol. Sex Differ., Vol. 11 .10.1186/s13293-020-00304-9
7. Peckham, H., N.M. de Gruijter, C. Raine, A. Radziszewska and C. Ciurtin *et al*., 2020. Male sex identified by global COVID-19 meta-analysis as a risk factor for death and itu admission. Nat. Commun., Vol. 11 .10.1038/s41467-020-19741-6
8. T. Takahashi, M.K. Ellingson, P. Wong, B. Israelow and C. Lucas *et al*., 2020. Sex differences in immune responses that underlie COVID-19 disease outcomes. Nature., 588: 315-320.
9. Garg, S., L. Kim, M. Whitaker, A. O'Halloran and C. Cummings et al., 2020. Hospitalization rates and characteristics of patients hospitalized with laboratory-confirmed coronavirus disease 2019-COVID-net, 14 states, march 1–30, 2020. MMWR. Morbidity Mortality Weekly Rep., 69: 458-464.

10. Oran, D.P. and E.J. Topol, 2020. Prevalence of asymptomatic SARS-CoV-2 infection. Ann. Internal Med., 173: 362-367.
11. Mizumoto, K., K. Kagaya, A. Zarebski and G. Chowell, 2020. Estimating the asymptomatic proportion of coronavirus disease 2019 (COVID-19) cases on board the diamond princess cruise ship, yokohama, Japan, 2020. Eurosurveillance, Vol. 25. 10.2807/1560-7917.es.2020.25.10.2000180
12. Day, M., 2020. Covid-19: Four fifths of cases are asymptomatic, China figures indicate. BMJ, Vol. 369 .10.1136/bmj.m1375
13. Gao, Z., Y. Xu, C. Sun, X. Wang, Y. Guo, S. Qiu and K. Ma, 2021. A systematic review of asymptomatic infections with COVID-19. J. Microbiol., Immunol. Infec., 54: 12-16.
14. Grasselli, G., A. Zangrillo, A. Zanella, M. Antonelli and L. Cabrini *et al*., 2020. COVID-19 Lombardy ICU Network. Baseline Characteristics and Outcomes of 1591 Patients Infected With SARS-CoV-2 Admitted to ICUs of the Lombardy Region, Italy. JAMA., 232: 1574-1581.
15. Bhatraju, P.K., B.J. Ghassemieh, M. Nichols, R. Kim and K.R. Jerome *et al*., 2020. Covid-19 in critically ill patients in the seattle region: Case series. New Engl. J. Med., 382: 2012-2022.
16. Guan, W.J., Z.Y. Ni, Y. Hu, W.H. Liang and C.Q. Ou *et al*., 2020. Clinical characteristics of coronavirus disease 2019 in China. New Engl. J. Med., 382: 1708-1720.
17. Huang, C., Y. Wang, X. Li, L. Ren and J. Zhao *et al*., 2020. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet, 395: 497-506.
18. Iftimie, S., A.F. López-Azcona, I. Vallverdú, S. Hernández-Flix and G. de Febrer *et al*., 2021. First and second waves of coronavirus disease-19: A comparative study in hospitalized patients in reus, spain. PLOS ONE, Vol. 16. 10.1371/journal.pone.0248029
19. Fluck, D., S. Rankin, A. Lewis, J. Robin and J. Rees *et al*., 2021. Comparison of characteristics and outcomes of patients admitted to hospital with COVID-19 during wave 1 and wave 2 of the current pandemic. Internal Emergency Med., 17: 675-684.
20. Soriano, V., P. Ganado-Pinilla, M. Sanchez-Santos, F. Gómez-Gallego, P. Barreiro, C. de Mendoza and O. Corral, 2021. Main differences between the first and second waves of COVID-19 in madrid, spain. Int. J. Infect. Dis., 105: 374-376.