
Research

Clinical characteristics and outcome of adult patients hospitalised with COVID-19 at Respiratory Unit in National Hospital Kandy, Sri Lanka

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Abstract

The COVID-19 pandemic created a terrible chaotic situation worldwide. As it is a specific infectious condition, the nurses and doctors should possess a high degree of knowledge and skills to overcome this problem. This study was carried out to describe the clinical characteristics and outcomes of adult patients hospitalized with COVID-19 at National Hospital Kandy. Descriptive cross-sectional study was conducted in Kandy National Hospital, Sri Lanka from March 2022 to August 2022. Patients presented with COVID-19 to the National Hospital Kandy for treatment were evaluated according to the study objectives. Patients who need hospital admission for treatments with CT value less than 30 at the admission were included for the study. The convenient sampling technique was applied to select 425 patients. The investigator administered structured data collection/extraction sheet was applied as study instrument for data collection. Data analysis was facilitated by SPSS version 25.0. The age of the study participants were ranged from 16 years to 87 years (Mean=57.37 years: SD=15.43 years). Majority of them were above 51 years (N=288: 67.7%). There was a male predominance (N=285: 67.1%). Diabetes was the medical complication seen among majority of the study participants (N=182: 42.8%). Mean pulse rate at the admission was 93/minute (SD=18.26). Mean blood pressures was 131.25mm/Hg(SD=23.1) systolic and 82.1mm/Hg (SD=13.2) diastole. Majority of them presented with respiratory rate less than 29/minute (N=237: 55.8%). Fever (N=196:46.1%), Dry cough (N=193: 45.4%) and the Shortness's of breath (N= 198: 46.6%) were the most prevalent clinical symptoms of patients at the time of admission. Majority of patients have received antibiotics (N=282: 66.4%) as a treatment. Mean duration of the Hospital stay was 7.9 days (SD=5.5). Majority of patients recovered and discharged from the Hospital (N=257: 60.4%). Death rate of the patients was 14.2% (N=60).

The study highlights that older age, and comorbidities increase the risk of hospitalization and adverse outcomes. Improved symptomatic treatment and targeted prevention strategies for high-risk populations are recommended.

Key words: Covid, treatment, hospital, recovery

Background

Emerging diseases appear newly in a population and spread to new geographical locations and affect people while re-emerging diseases which had previously declined but become a health issue again [1]. The emerging infectious diseases are rapidly increasing the rate of incidence, they are mostly caused by zoonotic

pathogens. Increasing population growth, global travel, changing vector habits, aging population, poor laboratory facilities promote the emergence and the rapid spread of the infections [2,3]. Changes in genetics of the pathogens and evolution of microbes have contributed to the emergence of diseases. Q fever in the Netherlands, Chikungunya fever in Italy, severe

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acute respiratory syndrome (SARS), avian influenza, A/H1N1 are some of the emerging diseases. Antibiotic resistance plays a major role in developing re-emerging diseases like pneumonia and tuberculosis [1]. On that wise COVID-19 a new emerging disease was discovered first in Wuhan, China and spread rapidly to many of the countries [4]. Worldwide there are 612 million confirmed cases, and 6.5 million deaths reported to WHO until 25 January 2022 and the incidence and the mortality rates are increasing continuously [5]. In Sri Lanka, 670,790 total confirmed cases were reported [6]. Among them 653,982 cases recovered, and 16,762 deaths were registered until 28.09.2022 [6]. Simultaneously COVID-19 has affected worldwide psychologically and economically [7,8]. There are probabilities to increased poverty in Sri Lanka due to the adverse impact of COVID-19 on the economy of the country [9]. Overseas COVID-19 patients' arrival, need of increased ICUs and the control measures are some definite burdens that Sri Lanka is facing [10]. Even though, more than 5.5 million individuals worldwide have died from COVID-19, many more millions have survived COVID-19 and experienced lasting sequelae [11]. The considerable number of patients who survived hospitalization for COVID-19 experience prolonged work absence, financial difficulty, or emotional effects, which may further impede recovery [12].

The COVID-19 pandemic created a terrible chaotic situation worldwide. Even developed countries didn't know how to handle this chaotic problem and save the lives of people [13]. People everywhere living with the hope that one day this will have an end. Moreover, health professionals, especially doctors and nurses are the frontline members who are fighting against the corona virus to save the lives of people [14]. As it is a specific infectious condition the nurses and doctors should possess a high degree of knowledge and skills to overcome this problem [15]. Poor understanding can lead to high rate of spreading the disease, and they should be clear about primary prevention of COVID-19 [4]. COVID-19 is a pandemic that has challenged the entire world. It is not uncommon for the world to see a crisis situation that arises immediately when a new unprecedented disease situation emerges [16]. However, over time, the emerging disease management strategies improve. Finding the etiology of the disease was the main challenge [17]. The exact etiological factor of COVID-19 has now been achieved. But there are constantly new challenges in treating the disease [18]. Among these challenges are emergence

of new strains of the virus and the development of resistance to the present treatment [19]. When this is the situation, routine clinical information analysis procedures are essential. This requires systematic scientific analysis, and this study is a fundamental approach to that.

Previous studies have investigated the long-term outcomes and challenges faced by COVID-19 survivors. Prescott (2021) analyzed one-quarter outcomes of 478 COVID-19 survivors in a Paris university hospital, providing key insights into long-term symptoms and organ dysfunction. Fatigue, dyspnea, cognitive issues, and psychological conditions were commonly observed, with some patients requiring cardiac evaluations [20]. Chopra (2021) conducted a six-month follow-up of 1,648 COVID-19 patients in Michigan, identifying persistent cardiopulmonary symptoms, difficulty in returning to normal activities, and financial hardship, with 23% mortality during the study [21]. Bravata (2021) reviewed ICU patient load and mortality trends in 8,516 COVID-19 patients across 86 North American hospitals, finding a significant association between critical care demand and mortality [22]. Carfi (2020) highlighted common persistent symptoms, including fatigue, insomnia, joint pain, and dyspnea, among COVID-19 survivors [23]. Similarly, Ahmed (2020) studied SARS and MERS survivors, identifying lung function abnormalities, psychological impairments, and reduced exercise capacity, suggesting similar post-COVID-19 complications [24].

Materials and methods

A descriptive cross-sectional study was conducted at National Hospital Kandy from March to August 2022. The study included adult patients (≥ 18 years) with RT-PCR-confirmed COVID-19 and a cycle threshold (CT) value < 30 at admission. Patients diagnosed more than 14 days prior to admission were excluded. A convenient sampling method was used to select 425 patients who required hospitalization [25].

Data collection was carried out using an investigator-administered structured data collection sheet. This sheet included demographic information, presenting symptoms, clinical parameters, laboratory findings, and treatment outcomes. Data extraction was performed using hospital records, including bed head tickets and medical notes. To ensure data accuracy, validation and cross-checking procedures were implemented.

Statistical analysis was conducted using SPSS version 25.0. Descriptive statistics were used to summarize patient characteristics, with continuous variables expressed as means and standard deviations, and categorical variables presented as frequencies and

percentages. Ethical approval for the study was obtained from the Ethics Review Committee of National Hospital Kandy. Administrative clearance was granted by the hospital authorities, ensuring compliance with ethical guidelines and patient confidentiality.

Results

Demographic and clinical characteristics

Table 1. Distribution of age and gender of study participants

| <i>Age Category</i> | <i>Frequency (N)</i> | <i>Percentage (%)</i> |
|---------------------|----------------------|-----------------------|
| <41 Years | 61 | 14.4 |
| 41-50 | 76 | 17.9 |
| 51-60 | 103 | 24.2 |
| 61-70 | 83 | 19.5 |
| >71 Years | 102 | 24.0 |
| Gender | | |
| Male | 285 | 67.1 |
| Female | 140 | 32.9 |
| Total | 425 | 100.0 |

The above table shows that most patients (67.1%) were male, and the majority (67.7%) were above 50 years of age, indicating a higher hospitalization rate among older individuals.

Medical comorbidities and clinical presentation

Table 2. Distribution of medical comorbidities among study participants

| <i>Comorbidity</i> | <i>Frequency (N)</i> | <i>Percentage (%)</i> |
|---------------------------------------|----------------------|-----------------------|
| Diabetes Mellitus | 182 | 42.8 |
| Hypertension | 164 | 38.6 |
| Ischemic Heart Disease | 78 | 18.4 |
| Heart Failure | 19 | 4.5 |
| Chronic Kidney Disease | 27 | 6.4 |
| Chronic Obstructive Pulmonary Disease | 37 | 8.7 |
| Bronchial Asthma | 56 | 13.2 |
| Total | 425 | 100.0 |

Diabetes mellitus (42.8%) and hypertension (38.6%) were the most common comorbidities, increasing the risk of severe disease in hospitalized patients.

Vital signs at admission

Table 3. Distribution of pulse rate and blood pressure at admission

| <i>Parameter</i> | <i>Frequency (N)</i> | <i>Percentage (%)</i> |
|-------------------------|----------------------|-----------------------|
| Pulse Rate (<60/min) | 4 | 0.9 |
| 61-70/min | 23 | 5.4 |
| 71-80/min | 69 | 16.2 |
| >81/min | 235 | 55.3 |
| Not Measured | 94 | 22.1 |
| Systolic BP (<100 mmHg) | 20 | 4.7 |
| 101-120 mmHg | 105 | 24.7 |
| 121-140 mmHg | 113 | 26.6 |
| 141-160 mmHg | 72 | 16.9 |
| >161 mmHg | 29 | 6.8 |
| Not Measured | 86 | 20.2 |

More than half of the patients (55.3%) had a pulse rate above 81 beats per minute, and nearly one-third had elevated blood pressure, suggesting heightened cardiovascular stress in COVID-19 patients.

Respiratory and oxygenation parameters

Table 4. Distribution of respiratory rate and oxygen saturation at admission

| <i>Parameter</i> | <i>Frequency (N)</i> | <i>Percentage (%)</i> |
|----------------------------|----------------------|-----------------------|
| Respiratory Rate (<19/min) | 53 | 12.5 |
| 20-29/min | 184 | 43.3 |
| 30-39/min | 12 | 2.8 |
| >40/min | 12 | 2.8 |
| Not Measured | 164 | 38.6 |
| Oxygen Saturation (>98%) | 146 | 34.4 |
| 96-97% | 74 | 17.4 |
| 95-94% | 28 | 6.6 |
| <93% | 82 | 19.3 |
| Not Measured | 95 | 22.4 |

Approximately 19.3% of patients had an oxygen saturation below 93%, indicating a significant number required oxygen support during hospitalization.

Presenting symptoms

Table 5. Clinical symptoms at admission

| <i>Symptom</i> | <i>Frequency (N)</i> | <i>Percentage (%)</i> |
|---------------------|----------------------|-----------------------|
| Fever | 196 | 46.1 |
| Dry Cough | 193 | 45.4 |
| Sore Throat | 59 | 13.9 |
| Shortness of Breath | 198 | 46.6 |
| Wheezing | 46 | 10.8 |
| Headache | 81 | 19.1 |
| Loss of Appetite | 83 | 19.5 |
| Arthralgia/Myalgia | 101 | 23.8 |
| Anosmia | 31 | 7.3 |

Fever (46.1%) and shortness of breath (46.6%) were the most common presenting symptoms, consistent with severe COVID-19 cases.

Hospitalization and outcomes

Table 6. Duration of hospital stay

| <i>Outcome</i> | <i>Frequency (N)</i> | <i>Percentage (%)</i> |
|----------------|----------------------|-----------------------|
| <5 days | 187 | 44.0 |
| 6-10 days | 137 | 32.2 |
| 11-15 days | 49 | 11.5 |
| 16-20 days | 38 | 8.9 |
| >21 days | 14 | 3.3 |

Most patients (44%) had a hospital stay of fewer than 5 days, while 12.2% stayed longer than 15 days due to severe illness.

Table 7. Patient outcomes

| <i>Outcome</i> | <i>Frequency (N)</i> | <i>Percentage (%)</i> |
|---------------------------------|----------------------|-----------------------|
| Recovered with No Complications | 181 | 42.6 |
| Discharged with Follow-up | 76 | 17.8 |
| ICU Care Required | 81 | 19.1 |
| Death | 60 | 14.2 |
| Transferred to Another Facility | 109 | 25.6 |

The mortality rate was 14.2%, while nearly 19.1% required ICU care, emphasizing the critical nature of COVID-19 hospitalizations.

Discussion

According to the present study findings, the highest vulnerability of being infected with COVID-19 was observed in the 40 to 60 years age group, a pattern that was not demonstrated in studies conducted by Roy (2020) and Banand (2020) [26,27]. A distinct male predominance was noted in this study, similar to findings from Kopel et al. (2020), while Ejaz (2020) reported a female predominance among COVID-19 patients [28,29]. In Sri Lanka, the general COVID-19 epidemiological pattern also indicated a male predominance [6]. Clinical conditions such as fever, dry cough, fatigue, and sore throat were among the most prevalent symptoms, consistent with studies from the South Asian region by Omprakash Meheta et al. (2020) [30]. However, Thevarajan (2020) reported a higher prevalence of dyspnea and dysphonia in Australian COVID-19 patients, which was associated with lower oxygen saturation levels, a trend also observed in European populations by Florian Gotzinger (2020) [31,32]. These findings suggest possible seasonal and geographical variations in the clinical presentation of COVID-19, which aligns with epidemiological principles that disease characteristics vary based on time, place, and population factors [33].

Approximately 50% of COVID-19 patients in this study had diabetes mellitus and hypertension, significantly higher than the prevalence of 14.5% reported by Alireza Abdi (2020) and 21% and 11%, respectively, as described by Awadhesh Karan Singh (2020) [34,35]. The National Epidemiology Unit of Sri Lanka also documented a strong association between COVID-19 and comorbid conditions [6,36]. However, since this study focused solely on hospitalized patients, a higher prevalence of comorbidities was expected compared to the general population. In a study with a similar methodology, Kenal Nandy (2020) identified diabetes mellitus, hypertension, and chronic kidney disease as the most prevalent comorbidities among hospitalized COVID-19 patients, along with a higher mortality rate among diabetic patients [37]. Conversely, Parasher et al. (2021) found hypertension and obesity to be more significant risk factors than diabetes mellitus [38]. While Nandy (2021) highlighted geographical and ethnic variations in comorbidities, this study did not observe an increase in blood pressure or glucose levels at hospital admission, suggesting that COVID-19 does not directly aggravate these conditions, although it complicates patient outcomes by reducing respiratory efficiency.

A systematic review by Anant Parasher (2021) reported widespread use of combined antibiotics, steroids, and oxygen therapy in treating COVID-19 patients [38]. Early in the pandemic, standardized treatment protocols were unavailable, leading to variability in management strategies among institutions. Sri Lanka initially relied on symptomatic treatment approaches, which allowed for clinician-based decision-making. Similar trends were observed globally, making direct comparisons of treatment strategies challenging. Many research studies reported delays in establishing definitive treatment guidelines due to initial precautionary measures and observational constraints. The lack of prior experience with COVID-19 also led to variations in treatment approaches and institutional decision-making.

Furthermore, hospitalization duration was influenced by non-clinical factors, including lack of transport facilities, high-risk household members, and inadequate home isolation capabilities, potentially increasing hospital-acquired infections. Consequently, some symptoms observed among hospitalized patients might not have been directly related to COVID-19. Since COVID-19 is a newly emerged disease, its natural history remains unclear, and observational studies like this one provide valuable insights for developing treatment protocols. Sri Lanka lacks an established patient monitoring system for COVID-19 cases, further emphasizing the importance of data from individual studies.

This study was conducted at the National Hospital Kandy, a tertiary care center that receives critical cases from peripheral hospitals, thereby reducing the external validity of findings. Variability in gender distribution, age prevalence, and comorbidity patterns across different studies highlights the influence of time, place, and population factors during a pandemic. The social stigma associated with COVID-19, even among health-care professionals, may have introduced biases in data collection and symptom reporting. The study utilized a customized data collection tool developed through extensive literature review and expert consultations. However, due to time and financial constraints, the tool was not validated before implementation, introducing potential internal validity limitations. Additionally, the lack of standardized COVID-19 study tools during the early pandemic limited the ability to address these methodological challenges effectively.

Conclusion

These findings emphasize the need for targeted prevention strategies focusing on high-risk groups,

particularly elderly individuals and those with chronic diseases. Strengthening early intervention, optimizing symptomatic treatment, and enhancing ICU capacity are crucial for improving patient outcomes. Future research should explore long-term sequelae among COVID-19 survivors and evaluate the effectiveness of evolving treatment protocols.

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