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Logistical Assistance and Survival Rate of COVID-19 Recovered Patients with Advanced Dementia

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Abstract

Background: COVID-19 is a serious and fatal disease, especially for the elderly. In an aging society, dementia is also an important medical, social, and economic issue.

Purpose: Logistical support and survival of COVID-19 recovered patients with advanced dementia were reported.

Methods: The characteristics of 14 dementia patients who were transferred directly to our hospital after receiving inpatient COVID-19 treatment at another medical facility were described.

Results: Of the 14 patients, 10 (71%) were males and 4 (29%) were females, with a median age of 85, a minimum of 76, and a maximum of 98. All of the subjects demonstrated various dementia-related behaviors and psychiatric signs. At previous hospitals for COVID-19 treatment, the median length of stay was 30 days, with a minimum of 12 days and a maximum of 59 days. Our hospital's median length of stay was 111 days, with a minimum of 22 days and a maximum of 350 days. Eleven (79%) were still alive, while 3 (21%) had died at the end of the observation period. The utilization rate of COVID-19 ready beds showed eight pandemic waves. The median, minimum, and maximum intervals were 66 days, 45 days, 109 days between the leading edge of each pandemic wave and the subjects' admission to our hospital. All subjects had survival rates of 0.81 in 100 days and 0.81 in 200 days following admission.

Conclusion: We depicted the logistical supports and survival rate of COVID-19 recovered patients with advanced dementia who were directly transferred from hospitals to our hospital for dementia-related behaviors and psychiatric symptoms. We believe that COVID-19 recovered patients with dementia will have a similar prognosis to COVID-19 uninfected patients with dementia.

Keywords: *COVID-19; Dementia; Logistical Support; Survival Rate*

Abbreviation

BPSD: Behaviors and Psychiatric Signs of Dementia

Introduction

Since the World Health Organization declared a state of emergency for the novel coronavirus disease (COVID-19) in January 2020, multiple waves of epidemics have occurred, with mutations and changes in virus strains being observed [1]. Japan will be in the eighth wave in 2023 [2]. 775 million people were infected worldwide, with 7.04 million dying [1], and 106,000 dying in Japan by the end of May 2024 [2].

The COVID-19 pandemic can place a significant burden on global health-care systems, and the collapse of the public health system is being closely monitored [3,4]. There are severe COVID-19 cases, so it is necessary to prepare a bed that can be hospitalized immediately (ready bed). Post-healing patient referral assistance is also required to ensure ready-to-respond hospital beds. The provincial government has established a logistical support medical facility to ensure that there are immediate response beds available at medical facilities capable of accepting new COVID-19 patients and other patients [5,6].

The proportion of the elderly aged 65 and up in the total population has been steadily increasing since 1950 (4.9%), reaching 10% in 1985, exceeding 20% in 2005, and 29.1% in 2022 [7]. The Japanese government estimates that the number of dementia patients was 4.62 million in 2012 and will increase to 7 million by 2025 [8]. Dementia is defined as a state in which intellectual function has returned to normal but is impaired in daily and social activities due to acquired organic disorders. In our area, the number of dementia patients is expected to double within the next decade [9]. Patients with dementia are a unique population who may be at high risk of death from COVID-19 [10-13]. It is critical to address dementia from the standpoint of securing ready-to-use hospital beds during a period of rapid increase in infectious diseases such as COVID-19.

We could find few reports on the survival rate of dementia [14]. Therefore, we present the logistical assistance and survival rate of patients with dementia who recovered from COVID-19.

Methods

Our hospital is a single-specialty psychiatric facility that specializes in dementia, with 120 beds, 2 observation rooms, and ten oxygen-providing beds. The facility lacks intensive care units and ventilators. PCR testing for COVID-19 has been performed in-hospital since March of 2021.

The subjects were 14 patients who were directly transferred from hospitals after recovering from COVID-19. All of the subjects underwent an intellectual evaluation as well as head and body computed tomography, and they all had behavioral and psychological symptoms of dementia (BPSD). The subjects were observed from December 1, 2020 to April 30, 2023.

Profiles

Of 14 subjects, we surveyed and summarized their attributes and characteristics.

Utilization rate for ready beds

We surveyed the utilization rate of ready beds for COVID-19 in our area [4]. The dates of the leading edges of each pandemic wave, as well as the dates of admission to our hospital were also reviewed. The intervals between both dates were measured.

Survival curve

The 14 subjects' survival curve was obtained using the Kaplan–Meyers method. Data were analyzed using R (version 4.0.1) and the library (survival).

There are no conflicts of interest in this research. This study was approved by our hospital's Research Ethics Committee (23-02).

Results

Profiles

Of the 14 patients, 10 (71%) were males and 4 (29%) were females, with a median age of 85, a minimum of 76, and a maximum of 98. There were nine cases of Alzheimer's disease (64%), two cases of senile dementia (14%), one case of mixed dementia (7%), and one case

of frontotemporal lobe dementia (7%). Concomitant diseases included hypertension 4 (29%), diabetes mellitus 3 (21%), chronic kidney disease 2 (14%), ischemic heart disease 1 (7%) and cerebrovascular disease 1 (7%), as shown in table 1. The intelligence assessment at admission was as low as 2.5 on the Hasegawa Dementia Scale (30-point scale) and 6 on the Mini-Mental State Examination (30-point scale). All subjects had BPSDs such as care-resistance 4 (29%) and refusal to eat 3 (21%) (Table 1).

BPSD	Number	(%)
Care-resistance	4	(29)
Refusal to eat	3	(21)
Shout	2	(14)
Wandering	2	(14)
Fall down	2	(14)
Hyperactivity	2	(14)
Irritability	2	(14)
Disquieting	1	(7)
Difficulty in solitary life	1	(7)
Memory impairment	1	(7)
Physical violence	1	(7)
Verbal violence	1	(7)

Table 1: *BPSDs (Behaviors and psychiatric signs of dementia) of the subjects.*

At the previous hospitals for COVID-19 treatment, the median length of stay was 30 days, with a minimum of 12 days and a maximum of 59 days. Seven of the subjects (50%) were given remdesivir, five (36%) received steroids, and three (21%) were placed on mechanical ventilation.

Our hospital's median length of stay was 111 days, with a minimum of 22 days and a maximum of 350 days. There were no physical restraints in our hospital, whereas seven (50%) were physically restrained in previous hospitals, which was statistically significant (Table 2).

	Previous hospitals	Our hospital
Constraint (+)	10	0
Constraint (-)	4	14
(%)	(71)	(0)
X^2 value 15.6, p-value < 0.0001		

Table 2: *Physical constraint.*

In prognosis, 11 (79%) of the subjects were still alive, while 3 (21%) died at the end of the observation period. Of the survivors, 6 (55%) were discharged, while 5 (36%) were in still in our hospital. Four (29%) were transferred to welfare facilities (Table 3). Two of the deceased died of aspiration pneumonia two and seven months after being admitted to the hospital, while one died of senility three months later.

Prognosis	Number	(%)			Number	(%)
Survival	11	(79)				
			Discharge	Welfare facility	4	(29)
				Own house	1	(7)
				Hospital	1	(7)
			Hospitalized		5	(36)
Death	3	(21)				
				Pneumonia	2	(14)
				Senalty	1	(7)

Table 3: *Prognosis and causes of death.*

Utilization rate of ready beds

The utilization rate of ready beds for COVID-19 exhibited eight pandemic waves (Figure 1). The median, minimum, and maximum intervals were 66 days, 45 days, 109 days between the leading edge of each pandemic wave and the subjects' admission to our hospital.

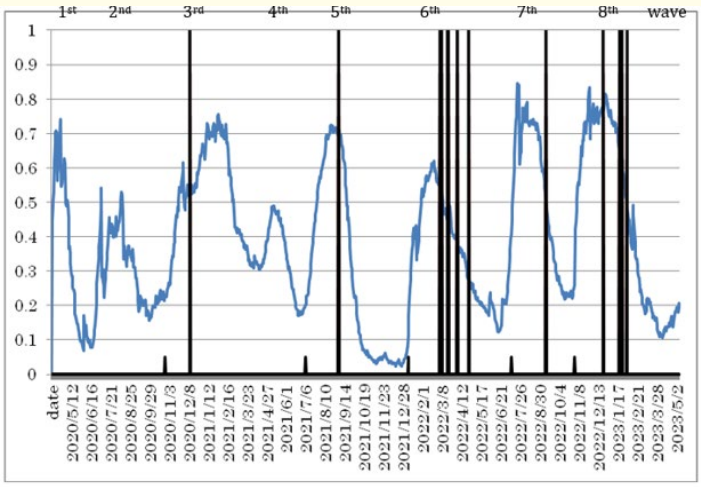

Figure 1: *The blue wave represents the utilization rate of ready beds for COVID-19. The short vertical lines represent the beginning of each epidemic wave, while the long vertical lines represent admission dates to our hospital.*

Survival rate

The survival rate was 0.81 in 100 days, 0.81 in 200 days, and 0.41 in 250 days following admission (Figure 2).

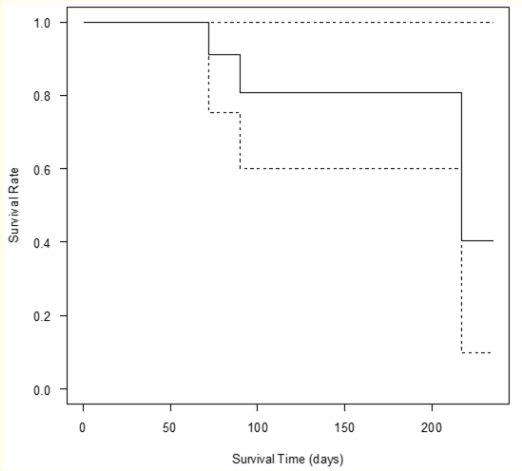

Figure 2: *The survival curve of 14 subjects is drawn by Kaplan-Meyer's method. The solid lines represent the survival rate, while the dashed lines represent the 95% confidence intervals.*

Discussion

We summed up the characteristics of patients with advanced dementia who were transferred from COVID-19-treated medical hospitals to our facility. The median length of stay at previous hospitals was 30 days, and the time between the end of each pandemic wave and admission to our hospital was 66 days in each endemic wave. In the midst of a rapid increase in the number of COVID-19 infected people, the pressing issue is to accept medicine-required patients and promote smooth hospital transfer support for patients who have been cured and recovered from COVID-19 in terms of securing beds for immediate response [6]. The collapse of the healthcare system is a serious concern [3,4]. Shortening the time between post-treatment and admission to logistical support medical institutions is directly related to the availability of emergency beds, which would result in a reduction in the healthcare burden.

The objects' survival rate was 0.81 after 100 days and 200 days respectively in this study. Mitchell reported that the survival rate for advanced dementia was 0.85 in 100 days and 0.72 1n 200 days [14]. Harb reported that hospitalized COVID-19 patients with dementia had higher mortality rates, but dementia was not an independent risk factor for death [15]. The survival rate of patients who recovered from COVID-19 is expected to be similar to that of the previous report. Therefore, we believe that cured postCOVID-19 patients with dementia will have the same prognosis as other people with dementia.

Dementia is a risk factors for acute delirium, which can be caused by advanced age, severe illness, depression, multiple medications, hearing and visual impairment, infections, drug addiction, alcohol and drug withdrawal, postoperative pain, and physical restraints, among other things. Delirium is commonly observed in dementia [16,17]. All subjects had BPSDs in this study and 70% of subjects had physical constraints prior to admission to our hospital that they did not have while in our hospital. The reason for the difference is thought to be COVID-19 recovery, a change in habitual environment, control of expressed emotion and minimal psychoactive agents, and our principle of freedom from physical constraints.

The study has several limitations. This is a case report that is both observational and descriptive. The subjects were not assigned at random and no control group was established in this study although all subjects were adopted serially. There is a risk of selection bias [18]. The number of subjects was so small that the survival rate became unreliable after 250 days.

Conclusion

We described the characteristics of dementia patients who were transferred to our hospital for logistical support following COVID-19 treatment. We believe that COVID-19 recovered patients with dementia will have a similar survival rate as COVID-19 uninfected patients with dementia.

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