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Malnutrition Prevalence Increased During the COVID-19 Pandemic in Patients with Dementia: A Retrospective Study from the Geriatric Outpatient Clinic

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ABSTRACT

Objective: Individuals who are clinically vulnerable and older are more susceptible to severe consequences, either directly from the coronavirus disease 2019 (COVID-19) infection or indirectly from the rigorous social isolation policies. Increased frailty, reduced quality of life, high level of stress, and increased depressive symptoms were observed during the social isolation period. Patients with dementia are more vulnerable to the direct and indirect effects of COVID-19. In this study, we have explored the impact of the COVID-19 pandemic on nutrition in patients with dementia who were followed up in our outpatient clinic.

Methods: Patients with a diagnosis of dementia who were followed up in the geriatric outpatient clinic at our university hospital were included in the study. The risk of malnutrition was evaluated using the Mini-Nutritional Assessment-Short Form (MNA-SF). An MNA-SF score between 8 and 11 was defined as risk of malnutrition, and scores < 8 were accepted as malnutrition. A retrospective study was performed using the identified electronic records of 121 patients who were admitted to the hospital between March 11, 2020, and March 31, 2021.

Results: The mean age of the study population was 80.12 ± 7.12 years, and 60.3% of the patients were female. The MNA-SF scores decreased and malnutrition prevalence increased as the dementia worsened, and the difference before and during the pandemic was statistically significant ($P < .05$).

Conclusion: For patients living with dementia, COVID-19 restrictions, particularly those related to social isolation like social distancing and lockdowns, might not only have mental and cognitive implications but also disturb their already vulnerable nutritional status.

Keywords: Coronavirus disease 2019, dementia, malnutrition

INTRODUCTION

Since the first case of coronavirus disease 2019 (COVID-19) infection, globally there have been more than 400 million confirmed cases and 5.5 million deaths as of February 21, 2022.[1] COVID-19 has also had a major destructive impact on economic, food, and health systems. People who are clinically vulnerable and older are more susceptible to severe consequences, either directly from COVID-19 infection or indirectly from rigorous social isolation policies. Patients with dementia form a part of this vulnerable group.

Measures taken against the COVID-19 infection directly and indirectly impact the physical and psychological health of older people. Increased frailty, reduced quality of life, high level of stress, and increased depressive symptoms were observed during the social isolation period.[2] Another consequence was that changes in dietary choices and lifestyle characteristics because of the COVID-19 related quarantine, potentially resulted in malnourishment.[3] Mostly studies have concentrated on the effect of nutrition on COVID-19; however, there is a lack of evidence of how COVID-19 and COVID-19 related quarantine affects nutrition.[3]

Patients with dementia are more vulnerable to the direct and indirect effects of COVID-19. They are at high risk for COVID-19 infection as they cannot manage self-hygiene and maintain social distancing. Furthermore, once

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infected, older adults with dementia are more likely to experience severe COVID-19 related outcomes, including death. During the pandemic, patients with dementia also experienced cognitive decline, worsening of psychiatric symptoms, and severe behavioral disturbances.[4]

Therefore, in this study, we have explored the impact of the COVID-19 pandemic course on nutrition in patients with dementia who were followed up in our outpatient clinic.

METHODS

Study design

Patients with a diagnosis of dementia who were followed up in the geriatric outpatient clinic at our university hospital were included in the study. This was a retrospective study conducted using the identified electronic records of patients who were admitted to the hospital between March 11, 2020, and March 31, 2021. A total of 244 patients with dementia were admitted to the outpatient clinic during this period, and 121 patients were included in the study after excluding patients with incomplete data. The data about age, sex, education, marital status, type and stage of dementia, comorbidities, and number of medications were collected from the electronic records of the patient's files. Mild, moderate, and severe dementia groups were defined according to the patients' Clinical Dementia Rating (CDR) scale.[5]

Clinical Frailty Scale (CFS) was used to determine the frailty status.[6] CFS of the patient was defined according to the clinical judgement of the physician and ranged from 1 (very fit) to 9 (terminally ill). Patients living with frailty was determined as CFS ≥5. Incontinence was accepted as either urinary or fecal or both per the descriptions of the patients or caregivers. Polypharmacy was defined as using five or more medications.[7] Fall events were recorded if the patient had fallen unintentionally in the previous year. Difficulty in falling asleep, frequently awakening during the night, or awakening early in the morning were categorized as insomnia.

The risk of malnutrition was evaluated by the Mini-Nutritional Assessment-Short Form (MNA-SF).[8] An MNA-SF score between 8 and 11 was defined as risk of malnutrition, and scores <8 were accepted as malnutrition. The presence of depression was assessed by the 15-item Yesavage Geriatric Depression Scale (YGDS),[9] and scores ≥5 were evaluated as depression.

Main Points

- Patients with dementia are more vulnerable to adverse outcomes of a pandemic, including social isolation.
- Social distancing and lockdown might impact not only the mental status but also disturb the already vulnerable nutritional status in these patients.
- During the pandemic period, malnutrition rates increased in patients with dementia.

Ethical approval

Ethics committee approval was received for this study from the ethics committee of Hacettepe University Ethics Boards and Commissions Non-interventional Clinical Researches. (Date: January 18, 2022, Decision No:2022/02-29)

Statistical analysis

The data obtained in the study were analyzed statistically using IBM Statistical Package for Social Sciences version 24.0 software (IBM Co., Armonk, NY, USA). The data from the three groups according to stages of dementia were analyzed. Tests of normality were performed. Categorical variables were stated as number (n) and percentage (%), and continuous variables as median (IQR) or mean ± standard deviation (SD) values according to their distributions (normal or not). To evaluate relationships between categorical variables, the chi-squared test was used. For comparing the three groups, Bonferonni's correction was used and subgroup analysis performed. Analysis of variance was used to compare the normally distributed numerical parameters between the three independent groups when appropriate, and the Kruskal-Wallis test was used to compare the parameters which were not normally distributed. The Wilcoxon signed rank test was performed to compare the paired MNA-SF scores before and during the pandemic. A value of $P < .05$ (two-sided) was accepted as statistically significant.

RESULTS

A total of 121 patients diagnosed with dementia were enrolled in the study. The mean age of the study population was 80.12 ± 7.12 years, and 60.3% of the patients were female. Study participants were categorized according to their stages of dementia, 52.1% (63 patients) had mild dementia, 42.1% (51 patients) were diagnosed with moderate dementia, and 5.8% (7 patients) had severe dementia. There were no differences in age and sex between the groups ($P > .05$). Their demographical features were also similar ($P > .05$).

The patients were evaluated in terms of geriatric syndromes. No differences were observed between the groups regarding depression, falls, osteoporosis, incontinence, polypharmacy, and insomnia ($P > .05$). However,

Table 1. Characteristics and Demographic Features of The Study Population According to Stages of Dementia				
	Mild dementia N:63	**Moderate dementia N:51**	**Severe dementia N:7**	***P***
Age, mean ± SD	79.57 ± 6.75	80.86 ± 7.28	79.71 ± 9.58	.625
Age groups, n(%)				.205
65–74 years	13 (20.6)	11 (21.6)	3 (42.9)	
75–84 years	36 (57.1)	23 (45.1)	1 (14.3)	
>85 years	14 (22.2)	17 (33.3)	3 (42.9)	
Sex, female, n (%)	40 (63.5)	28 (54.9)	5 (71.4)	.535
Marital status, married, n (%)	30 (65.2)	14 (40.0)	3 (75.0)	.056
Education, <8 years, n (%)	25 (58.1)	20 (62.5)	2 (66.7)	.905
Geriatric Syndromes, n (%)				
Living w/ frailty	52 (82.5)	50 (98.0)	7 (100.0)	.015
Depression	20 (32.3)	18 (35.3)	2 (28.6)	.908
Incontinence	19 (30.2)	24 (47.1)	5 (71.4)	.039
Falls	12 (26.7)	6 (14.3)	3 (60.0)	.049
Osteoporosis	26 (54.2)	15 (34.1)	2 (28.6)	.151
Polypharmacy	42 (72.4)	38 (82.6)	4 (80.0)	.464
Insomnia	11 (23.9)	16 (37.2)	2 (28.6)	.284
Chronic Conditions, n (%)				
Hypertension	46 (73.0)	34 (66.7)	4 (57.1)	.588
Diabetes mellitus	18 (28.6)	18 (35.3)	2 (28.6)	.734
Coronary artery disease	16 (25.4)	17 (33.3)	1 (14.3)	.454
Hyperlipidemia	12 (19.4)	9 (17.6)	-	.442
Atrial fibrillation	8 (12.9)	13 (25.5)	-	.098
Hypothyroidism	7 (11.3)	1 (2.0)	-	.108
COPD	5 (8.1)	5 (9.8)	-	.675
Cerebrovascular disease	4 (6.5)	7 (13.7)	1 (14.3)	.407
Malignancy	8 (12.9)	8 (15.7)	1 (14.3)	.915
Rheumatologic disease	3 (4.8)	2 (3.9)	1 (14.3)	.497

COPD: Chronic Obstructive Pulmonary Disease
* After Bonferroni correction, the group from which the difference originated was specified.

the patients became more frail as the stage of dementia progressed, and the difference was statistically significant ($P < .05$). Furthermore, chronic conditions were not statistically different between groups ($P > .05$). The detailed results are shown in Table 1.

Malnutrition prevalence was also higher as the dementia worsened before and during the pandemic, and the difference was statistically significant ($P < .05$) (Table 2). However, the malnutrition ratio was 12.7% before the pandemic and rose to 23.8% during the pandemic in patients with mild dementia. In patients with moderate dementia, the malnutrition rates before and during the pandemic were detected as 15.7% and 49.0%, respectively. The number of malnourished patients with severe dementia had not changed; however, the rate of risk of malnutrition was in-

Table 2. Malnutrition Prevalence Before and During the Pandemic Course According the Stages of the Dementia

	Mild dementia N:63	Moderate dementia N:51	Severe dementia N:7	*P*
Malnutrition assessment before pandemic				.003
Normal, n (%)	28 (44.4)	11 (21.6)	1 (14.3)	
Malnutrition risk, n (%)	27 (42.9)	32 (62.7)	2 (28.6)	
Malnourished n (%)	8 (12.7)	8 (15.7)	4 (57.1)*	
MNA-SF scores, median (IQR)	11.0 (2.0)	11.0 (2.0)	7.0 (6.0)	.005
Malnutrition assessment during pandemic				.016
Normal, n (%)	13 (20.6)	3 (5.9)	-	
Malnutrition risk, n (%)	35 (55.6)	23 (45.1)	3 (42.9)	
Malnourished n (%)	15 (23.8)	25 (49.0)*	4 (57.1)*	
MNA decline, n (%)	41 (65.1)	39 (76.5)	4 (57.1)	.325
MNA-SF scores, median (IQR)	11.0 (3.0)	8.0 (5.0)	4.0 (7.0)	.003

*After Bonferroni correction, the group from which the difference originated was specified.
MNA-SF: mini-nutritional assessment short form; IQR: interquartile range

Table 3. Wilcoxon Signed-Rank Test Results of MNA-SF Scores of the Participants Before and During the Pandemic

	Median	(25^{th}–75^{th} percentile)	*P*
MNA-SF, before pandemic	11.0	9.0-12.0	< .001
MNA-SF, during pandemic	9.0	7.0-9.0	

MNA-SF: mini-nutritional assessment short

Table 4. Malnutrition Assessments According to MNA-SF Before and During the Covid-19 Pandemic Course.

	Before COVID-19	During COVID-19	*P*
Malnourishment	20 (16.5)	44 (36.4)	< .001
Malnutrition risk	40 (33.1)	61 (50.4)	
Normal	61 (50.4)	16 (13.2)	
Total	121 (100.0)	121 (100.0)	

MNA-SF: mini-nutritional assessment short form; COVID-19: coronavirus disease 2019

creased to 42.9% during the pandemic from 28.6% before the pandemic. More than half of the patients in all groups had a decline in their MNA-SF scores. The results can be seen in Table 2. The median MNA-SF score before the pandemic was 11.0 (9.0–12.0) decreased to 9.0 (7.0–9.0) during the pandemic, with the difference being significant ($P < .001$). The results are shown in Table 3. Malnutrition assessment according to MNA-SF scores before and during the COVID-19 pandemic is summarized in Table 4.

DISCUSSION

Patients with dementia are highly vulnerable to rigorous social isolation policies. The most important outcome of

our study was the observation of increased malnutrition risk rates and malnourishment during the pandemic period in all the three stages of dementia.

Patients with dementia are more vulnerable, neglected, and negatively discriminated and are not capable of caring for themselves. Multiple studies have shown that individuals with dementia are negatively affected by health decisions made in relation to COVID-19, and the long-term effects include neurological damage. It is known that the clinical condition of patients with dementia worsen owing to the enhancing effect of the pandemic, indirectly diminishing social support and decreasing interaction with the healthcare system.[10]

Malnutrition and dementia are two closely related geriatric syndromes, resulting in undesirable outcomes. Many different mechanisms may lead to malnutrition in patients with dementia. Changes in dietary habits and deficient nutrients and diet cause malnutrition in early stages of dementia. Dependency in preparing meals or shopping is another reason for malnutrition. In the later stages of dementia, patients may forget whether they have already eaten or may no longer know what they are supposed to do with the food. Furthermore, medications used for the treatment of dementia affect the appetite.[11] Malnutrition is strongly associated with cognitive decline, disease progression, institutionalization, mortality and decreased functional status, increased caregiver burden, and poor quality of life in patients with dementia.[12]

A study from Greece investigating the impact of COVID-19 on older individuals with mild cognitive impairment (MCI)/dementia has revealed an overall decline in mental and physical health in terms of communication, movement, and compliance with the new measures and also increased caregiver burden.[13] In that study, 46% of patients with MCI/dementia had "some" or "a lot" of changes in appetite. According to the authors, as the COVID-19 pandemic disrupted basic routines that support the mental and physical health of both older people with MCI/dementia and their caregivers, this disruption may have resulted in both physical and mental decline.[13] The reason for the increase in the rate of malnutrition in our study may be disruption of basic routines, decreased appetite, and increased caregiver burden.

In a study assessing the impact of the lockdown on nutritional status in older people living at home in France, a significant decrease in MNA scores, BMI, and weight was observed after the lockdown period.[14] Psycho-socio-environmental factors, psychiatric problems, mobility dependence, and acute infections had a major impact on malnutrition after confinement.[14] All these aforementioned factors were frequent in patients with dementia, though it may have led to increased malnutrition rates in our study population during pandemic course.

Our study has some limitations. First, as this was a retrospective study with a small number of participants, weight, BMI, anthropometric measurements, the amount and duration of weight loss, and also the reasons of malnutrition were undetermined. In the literature, studies and reviews have mostly focused on the direct relationship between malnutrition and COVID-19 infection; however, the indirect effect of this pandemic on the nutritional status in patients with dementia is pending. The impact of COVID-19 on patients with dementia has been mostly investigated from a psychosocial perspective. Considering all these findings, our study is important in terms of adding value to the literature.

CONCLUSION

For the patients living with dementia, the COVID-19 restrictions, particularly those related to social isolation like social distancing and lockdowns, might not only have mental and cognitive implications but also disturb their already vulnerable nutritional status.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Hacettepe University Ethics Boards and Commissions Non-interventional Clinical Researches. (Date: January 18, 2022, Decision No: 2022/02-29)

Informed Consent: Written informed consent was obtained from patients who participated in this study.

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