FACTORS AFFECTING THE LENGTH OF STAY IN AMYOTROPHIC LATERAL SCLEROSIS IN PALLIATIVE CARE

Palyatif Bakımda Amyotrofik Lateral Skleroz'da Yatış Süresini Etkileyen Faktörler

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ABSTRACT

Objective: Amyotrophic lateral sclerosis (ALS) is a progressive neurodegenerative disease that progresses with the degeneration of upper and lower motor neurons. In our study, we aimed to investigate the effects of demographic characteristics and symptoms of patients hospitalized in our palliative care center (PCC) with ALS on length of stay (LOS).

Material and Methods: Forty-seven patients were included in this retrospective study. The ages, sexes, diagnosis times, LOS in PCC, percutaneous endoscopic gastrostomy (PEG), tracheostomy, pressure ulcer (PU), discharge conditions and symptoms of the patients included in the study were compared. The diagnosis of insomnia and depression were made using the Beck Depression Inventory II (BDI-II) and Athens Insomnia Scale (AIS).

Results: The mean age of the patients was 56.55 years; the average length of stay was 50.55 days. All patients had a tracheostomy, 95.7% had PEG, and 55.3% had PU. 66% of the patients had insomnia, 61.7% had depression and all had pain, and the discharge status of 21.3% was exitus. We found that the length of stay was significantly longer in patients with symptoms of depression and insomnia among the patients we followed up in PCC. (p=0.049, p=0.014)

Conclusion: Diagnosis and treatment of symptoms such as depression, insomnia and pain in patients with ALS who are followed up in palliative care should be timely and adequate support should be provided. We think that early access to PC, timely recognition of symptoms and good management of patients diagnosed with ALS will increase the quality of life of patients.

Keywords: *Amyotrophic Lateral Sclerosis; Length Of Stay; Palliative Care*

ÖZET

Amaç: Amyotrofik lateral skleroz (ALS), üst ve alt motor nöronların dejenerasyonu ile seyreden ilerleyici bir nörodejeneratif hastalıktır. Çalışmamızda palyatif bakım merkezimize (PBM), ALS tanısı ile yatırılan hastaların demografik özelliklerinin ve semptomlarının yatış sürelerine etkilerini araştırmayı amaçladık.

Gereç ve Yöntemler: Bu retrospektif çalışmaya 47 hasta dahil edildi. Çalışmaya alınan hastaların yaşları, cinsiyetleri, tanı süreleri, yatış süreleri, perkütan endoskobik gastrostomi (PEG), trakeostomi, basınç ülseri (BÜ), çıkış durumları ve semptomları karşılaştırıldı. Uykusuzluk ve depresyon tanısı Beck Depresyon Envanteri II (BDE-II) ve Atina Uykusuzluk Ölçeği (AUÖ) kullanılarak konuldu.

Bulgular: Hastaların yaş ortalaması 56,55 yıl, hastanede yatış süreleri ortalama 50,55 gündü. Hastaların tamamında trakeostomi, %95,7'sinde PEG, %55,3'ünde BÜ vardı. Hastaların %66'sında uykusuzluk, %61,7'sinde depresyon ve tamamında ağrı vardı ve %21,3'nün çıkış durumu exitustu. PBM de takip ettiğimiz hastalardan depresyon ve uykusuzluk semptomu olan hastaların yatış sürelerinin anlamlı derecede daha uzun olduğunu saptadık. (p = 0,049, p = 0,014)

Sonuç: Palyatif bakımda izlenen ALS tanılı hastaların depresyon, uykusuzluk, ağrı gibi semptomlarının tanı ve tedavisi zamanında yapılmalı, hastalara yeterli destek sağlanmalıdır. ALS tanısı alan hastaların erken dönemde palyatif bakıma erişmeleri, semptomların zamanında tanınması ve iyi yönetilmesinin hastaların yaşam kalitesini artıracağını düşünüyoruz.

Anahtar Kelimeler: *Amyotrofik Lateral Skleroz; Yatış Süresi; Palyatif Bakım*

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INTRODUCTION

Amyotrophic Lateral Sclerosis (ALS) is a progressive neurodegenerative disease that results in the degeneration of upper and lower motor neurons, weakness, and wasting of muscles. This typically causes loss of mobility, difficulty in speaking, swallowing and breathing, and survival is usually between 3 and 5 years (1). Death is often caused by respiratory failure as a result of progressive muscle weakness (2). Multidisciplinary team care, early use of noninvasive ventilation, timely use of gastrostomy tube, and effective symptom management in patients are known to increase survival (3). Symptoms such as sialorrhea, spasticity, respiratory dysfunction, bulbar dysfunction, frontotemporal dementia, affective disorder, depression, pain are common in ALS (4). Since there is currently no curative treatment for ALS, the management of these complex symptoms depends on multidisciplinary care. Symptomatic and rehabilitative treatment is usually administered by a multidisciplinary team of neurologists, nurses, and coordinated and organized therapists (5). Early referral to specialized palliative care (PC) services is recommended for ALS patients (6). Many of the patients may not be diagnosed up to 12 months after their first symptoms and therefore they may have developed severe disabilities and may have a short prognosis. Since there is no cure and the prognosis is poor, it is more appropriate to start PC as soon as the diagnosis is made. PC is proven to improve the quality of life of ALS patients and caregivers (7).

Awareness is increasing in the role of PC in ALS. In ALS, PC aims to manage the pain and the symptoms, ensure maximum possible survival, provide psychosocial and spiritual support, and improve the quality of life of patients, their families, and caregivers. Timely recognition of symptoms and good management of patients in palliative care helps patients to provide optimal palliative care and improve their quality of life (8). In this study, we aimed to investigate the effects of demographic characteristics and symptoms such as depression, insomnia, and pain on length of stay (LOS). We research how long after the diagnosis the patients with ALS admitted in our palliative care center(PCC) apply to us, discharge statuses, LOS in PBM, percutaneous endoscopic gastrostomy (PEG), tracheostomy rates, pressure ulcer (PU) and symptoms.

MATERIAL AND METHODS

The retrospective study was approved by Health Science University Dışkapı Training and Research Hospital Ethics Committee (No:78/70, Date:23/12/2019). All procedures were applied in accordance with the principles of the Declaration of Helsinki. The files of 47 patients who were followed up with the diagnosis of ALS in the PCC of our hospital between January 1, 2014 and January 1, 2020 were reviewed retrospectively. Patients who met possible and precise ALS criteria according to El Escorial criteria were considered to have motor neuron disease (9). Patients with signs and symptoms of dementia (frontotemporal) were excluded from the study (n = 6) The symptoms seen in the patients were classified as pain, insomnia, and depression. The ages, sexes, diagnosis times, LOS, PEG, tracheostomy, PU, discharge conditions (home, intensive care unit (ICU), exitus), and symptoms of the patients included in the study were compared.

The patients considered to have depression were diagnosed by psychiatrists using the questionnaires: the Beck Depression Inventory II (BDI-II). BDI-II is a 21-item multiple-choice self-report scale and a standard questionnaire of depression. BDI-II assesses the presence and severity of the depressive symptoms and evaluates the cognitive, motivational, autonomic, and somatic domains. The total score can range from 0 to 63, and the used cut-offs were: <10 no depressive symptoms; 10–13 minimal depressive symptoms; 14–19 mild depressive symptoms; 20–28 moderate depressive symptoms; ≥29 severe depressive symptoms (10).

The diagnosis of insomnia was made using the Athens Insomnia Scale (AIS) (10). AIS consists of eight items and each item was evaluated on a 0–3 point scale (0 = no problem and 3 = very serious problem). The total of these eight items varied between 0 and 24, with 6 or more points rated as a sleep disorder (11). The severity of the pain was evaluated using the Visual Analogue Scale (VAS). VAS is a continuous scale comprised of a horizontal or vertical line, usually 10 centimeters (100 mm) in length. Patients with a VAS score between 0 and 2 cm were considered pain-free (12).

Statistical Analysis

The study data were transferred to SPSS Statistics 23

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package software and the analyzes were completed. While evaluating the study data, frequencies (number, percent) were provided for categorical variables and descriptive statistics (mean, standard deviation, median, minimum, maximum) for numerical variables. Normality assumptions of numerical variables were examined using Kolmogorov Smirnov normality analysis and it was observed that the normal distribution assumption was not obtained. Therefore, nonparametric statistical methods were used in the study. The differences between the two independent groups were examined using Mann Whitney U Analysis. Relationships between two independent categorical variables were checked using Chi-Square analysis. In cases where the expected value assumption is not provided in the Chi-Square analysis, Fisher's Exact test is used. The relationships between two independent numerical variables were interpreted using Spearman's Rho Correlation coefficient. Statistical significance was taken as 0.05 in the analysis.

RESULTS

The mean age of the patients was 56.66 years and 57.4% of the patients. Their length of stay was 50.55 days, and the mean diagnosis period was 2.65 years. All patients had a tracheostomy, 95.7% had PEG, and 55.3% had PU. While 46.8% of the patients were discharged home, 31.9% were taken to the intensive care unit and 21.3% were exitus. 66% of the patients had insomnia, 61.7% had depression and all had pain. (Table 1)

There is a statistically significant difference in the length of stay according to the symptoms of insomnia and depression ($p<0.05$). Accordingly, the length of stay in patients with insomnia is significantly higher than that of those without insomnia (61.52 ± 49.32 - 29.31 ± 23.66 p = 0.014). The length of stay of those with depression is significantly higher than those without depression (59.86 ± 48.52- 35.56 ± 34.16 p = 0.049). (Table 2)

The mean age of those discharged to home was 57.45, it was 54.8 for the ones admitted to ICU and 57.20 for the ones exitus. The mean length of stay of those discharged to home was 43.45 days, it was 46.33 days for the ones admitted to ICUs and 72.50 days for the ones exitus. The mean diagnosis period for those discharged to home was 2.52 years, it was 2.5 years for those admitted to CU and 3.16 years for the ones exitus.

Table 1. Demographic characteristics of patients

Age*	56.55 ± 12.453	59.0 (35.0-77.0)
Sex**		
Female	20	42.6
Male	27	57.4
Length of Stay (Days)*	50.55 ± 44.804	35.0 (5.0-210.0)
Diagnosis Period (Years)*	2.65 ± 1.558	2.0 (0.5-5.0)
Discharge Condition**		
Home	22	46.8
ICU	15	31.9
Exitus	10	21.3
PEG**	45	95.7
Tracheostomy**	47	100.0
PU**	26	55.3
Pain**	47	100.0
Insomnia**	31	66.0
Depression**	29	61.7

*: Mean ± Standard Deviation, Median (Min-Max), **: n, % ICU: Intensive care unit, PEG: Percutaneous endoscopic gastrostomy, PU:Pressure ulcers

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Table 2. Examination of the relationship between the length of stay and variables

	Length of Stay			Z	p
	N	**Mean.±S.D.**	**Median(Min-Max)**		
Sex					
Female	20	37.2 ± 33.906	25(5-145)	-1.659	0.097
Male	27	60.44 ± 49.726	42(13-210)		
PU					
Present	26	52.54 ± 41.173	39(5-145)	-0.643	0.520
Absent	21	48.1 ± 49.866	35(5-210)		
Insomnia					
Present	31	61.52 ± 49.329	42(13-210)	-2.450	**0.014***
Absent	16	29.31 ± 23.661	20(5-87)		
Depression					
Present	29	59.86 ± 48.527	43(5-210)	-1.961	**0.049***
Absent	18	35.56 ± 34.164	22.5(5-143)		
	N	**r**	**p**		
Age	47	0.263	0.074		
Diagnosis Period	47	0.074	0.623		

Z: Mann Whitney U Analysis; r: Spearman's Rho Correlation Coefficient; * :p<0.05, PU:Pressure ulcers

The Mann Whitney U analysis did not reveal any statistically significant difference between the patients discharged to home, admitted to ICU, or was exitus in terms of age, length of stay, and diagnosis period (p > 0.05). The rate of exitus is 15% in women, and 25.9% in men. While the rate of exitus in those with PEG is 22.2%, it is 30.8% in those with PU. While the rate of exitus those with insomnia was 19.4%, the rate of exitus in those with depression was 20.7%. The statistical analysis revealed that there was no statistically significant relationship between discharge status and sex, PEG, bed ulcers, insomnia, and depression (p > 0.05). (Table 3)

DISCUSSION

Amyotrophic lateral sclerosis (ALS) is a late-onset fatal neurodegenerative disease that affects motor neurons with an incidence of approximately 1/100000. The most common form is sporadic with no genetically significant component (90-95%) (13). The first onset of symptoms is 58-63 years for sporadic ALS and 47-52 years for familial ALS, and it is slightly more common in men (14). The mean age of patients diagnosed with ALS followed up in our PCC was 56.55 years and 57.4% were men. The average length of stay was 50.55 days, and the average diagnosis period was 2.65 years.

In ALS, palliative care should ideally begin from diagnosis and continue throughout the entire history of the disease. The approach should combine both clinical and community-based care from the onset of the disease and continue even after the patient dies (15). Galvin et. al. showed that the time from the first symptom of patients diagnosed with ALS to applying to multidisciplinary clinics was 19 months (16). We observed that the patients applied to PCC on average 2.6 years after diagnosis. Due to respiratory and nutritional problems, all of the patients had a tracheostomy and 95.7% had PEG in other centers previously. Previously, invasive ventilation (IV) and non-invasive ventilation (NIV) have been shown to be effective in reducing symptoms, improving quality of life, and prolonging life (17). In their study, Tagami et al. showed that tracheostomy and invasive ventilation in patients with ALS had a longer medial survival period compared to patients with non-invasive ventilation and the control group without ventilation (18). However, there is limited evidence to suggest that PEG prolongs survival in ALS patients. The findings of a meta-analysis

Table 3. Examination of the relationship between discharge condition and variables

	Discharge Condition						K.W.	p
	HOME		ICU		EXITUS			
	Mean.±S.D.	Median (Min-Max)	Mean.±S.D.	Median (Min-Max)	Mean.±S.D.	Median (Min-Max)		
Age	57.45±13.081	59(35-77)	54.8±12.52	50(39-77)	57.2±11.915	59.5(35-75)	0.426	0.808
Length of Stay	43.45±29.658	35(13-125)	46.33±44.362	32(5-143)	72.5±66.772	45.5(10-210)	1.646	0.439
Diagnosis Period	2.52±1.592	2(0.5-5)	2.5±1.452	2(0.5-5)	3.16±1.686	3.5(0.58-5)	1.136	0.567
	N	%	N	%	N	%	X^2	p
Sex								
Female	10	50.0	7	35.0	3	15.0	0.824	0.662
Male	12	44.4	8	29.6	7	25.9		
PEG								
Present	20	44.4	15	33.3	10	22.2	1,560[F]	0.695
Absent	2	100.0	0	0.0	0	0.0		
PU								
Present	11	42.3	7	26.9	8	30.8	3.171	0.205
Absent	11	52.4	8	38.1	2	9.5		
Insomnia								
Present	17	54.8	8	25.8	6	19.4	2.477	0.290
Absent	5	31.3	7	43.8	4	25.0		
Depression								
Present	16	55.2	7	24.1	6	20.7	2.579	0.291
Absent	6	33.3	8	44.4	4	22.2		

K.W. Kruskal Wallis X2: Chi-Square Analysis F: Fisher's Exact Analysis *:p<0.05 In cases where the expected value assumption is not provided in the Chi-Square analysis, Fisher's Exact Analysis is used. PEG: Percutaneous endoscopic gastrostomy, PU:Pressure ulcers

carried out by Cui et al. showed that ALS patients who underwent PEG had increased 20-month survival rates and that it had no significant effect on 30-day, 10-month, and 30-month survival rates (19). 55.3% of patients with ALS followed up in palliative care had PU. Inactivity, malnutrition, excessive skin moisture, urine, and fecal incontinence are increased risk factors in the development of pressure ulcers (20). We think that more than half of the patients with ALS followed up in palliative care have PU when they apply because they are inactive patients with nutrition problems.

Pain is a possible complication of ALS, its prevalence ranges from 3% to 78%, and is directly proportional to decreased functional status and disease duration (21). Pain in ALS was associated with stress, muscle contractions, decreased joint mobility, cramps, spasticity, and skin pressure caused by immobility in the bone and joints that lost the protective muscle sheath due to atrophy (22). All of the patients we followed up in palliative care had pain symptoms; we thought that this was associated with patients applying to palliative care in the later stages of the disease. Studies have shown that patients with ALS are more likely to develop depression compared to individuals without ALS, however, the prevalence of reported depression varies greatly (23). Roos et al. showed that patients diagnosed with ALS were at high risk of depression for one year before and after ALS diagnosis compared to individuals without ALS (24). 61.7% of the patients who were followed up in our palliative care were diagnosed with depression and received treatment.

Sleep disorders are extremely common in ALS patients

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and contribute significantly to the burden of the disease for both patients and caregivers. Sleep disorder may be caused by symptoms such as respiratory muscle weakness, muscle cramps, pain, decreased mobility, spasticity, and restless leg syndrome, and it may lead to significant sleep disorders in depression and anxiety (25). In their study, Panda et al. found that almost half of ALS patients had low sleep quality and two-thirds suffered from sleep disorders (26). In our study, 66% of the patients had insomnia and therefore treatment was started. Insomnia and depression negatively affect the quality of life in patients diagnosed with ALS (25,27). We found that ALS patients with depression and insomnia had a significantly longer length of stay in PCC. We thought that this may be the result of a decrease in the quality of life depending on the symptoms. The length of stay of exitus patients had a longer length of stay than average, but there was no statistically significant difference.

Since ALS does not have a curative treatment, the focus is on treatments and interventions that prolong survival (28). Since ALS mortality is mostly caused by respiratory failure, evaluation, and management of respiratory function is of great importance (29). All of our patients diagnosed with ALS and followed up in our PPC were tracheostomized and 21.3% (n = 10) died during their stay. While 46.8% of the remaining patients were discharged to home, 31.9% were admitted to intensive care. There was no significant relationship found between discharge conditions and age, sex, length of stay, diagnosis period, PEG, PU, and symptoms. In our study, there were some methodological limitations such as a low number of patients and the absence of a control group. In addition, suspicious reliability should be considered in the diagnosis of depression in patients due to overlaps between some ALS symptoms and somatic complaints in depression.

CONCLUSION

Palliative care in ALS disease is holistic management aiming to optimize the quality of life of patients and caregivers. Palliative care should start at the time of diagnostic and continue throughout the entire history of the disease to meet the individual needs of patients and their families (30). In conclusion, we found that most of the patients diagnosed with ALS applied to our center with their PEG and tracheostomies performed in the outer centers, and more than half of them developed pressure ulcers. We found that among the patients with ALS followed up with PCC, the ones with depression and insomnia had a significantly longer length of stay. We thought that this may be the result of a decrease in the quality of life depending on the symptoms. Diagnosis and treatment of symptoms such as depression, insomnia and pain in patients with ALS who are followed up in palliative care should be timely and adequate support should be provided. We think that early access to PC, timely recognition of symptoms and good management of patients diagnosed with ALS will increase the quality of life of patients.

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