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Disability in Patients with Spinal Cord Injury and Chronic Renal Failure

Omurilik Yaralanmalı Parapleji Hastaları ile Kronik Böbrek Yetmezliği Hastalarında Engellilik Değerlendirmesi

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ABSTRACT

Objectives: This study aimed to compare the status of disability between chronic renal failure patients who underwent hemodialysis (HD) and patients with paraplegia due to spinal cord injuries.

Methods: Thirty chronic renal failure patients (12 women and 18 men) who have been receiving regular HD treatment (HD group) and 30 paraplegic patients (Paraplegic group) (22 women and 8 men) defined by Spinal Cord Injury Association were recruited to the study. All sociodemographical characteristics and brief personal information about the dialysis and paraplegic patients were recorded. The disability status was analyzed by Craig Handicap Assessment and Reporting Technique Short Form (CHART-SF).

Results: The mean ages of patients were 39.40±6.81 in HD and 36.17±8.92 years in the spinal cord injury group (p>0.05). According to CHART subgroup analysis, the physical independence level was 89.20±21.43 and 77.87±33.25 (p>0.05); cognitive evaluation was 91.97±18.15 and 77.63±33.25 (p<0.05*); mobility was 76.23±11.14 and 70.10±23.68 (p>0.05); roles and activities status were 24.58±35.10 and 38.75±40.22 (p>0.05); social integration was 70.37±16.30 and 64.37±22,64 (p>0.05); in HD and paraplegic group, respectively.

Conclusion: Although there is no physically handicapped state in HD patients, the severity of disability level is considered to be as high as in paraplegic patients.

Keywords: Chronic renal failure; disability; hemodialysis; spinal cord injury.

ÖZET

Amaç: Bu çalışmada, hemodiyalize giren kronik böbrek yetmezliği hastaları ile omurilik yaralanmasına bağlı paraplejisi olan hastalar arasındaki özürlülük durumlarının karşılaştırılması amaçlandı.

Yöntem: Düzenli hemodiyaliz tedavisi gören (hemodiyaliz grubu) 30 kronik böbrek yetmezliği hastası (12 kadın, 18 erkek) ve omurilik yaralanmalı 30 paraplejik hasta (parapleji grubu) (22 kadın, 8 erkek) çalışmaya alındı. Diyaliz hastaları ve parapleji hastalarının tüm sosyodemografik özellikleri ve kısa kişisel bilgileri kaydedildi. Her iki grubun engellilik durumu Craig Engellilik Değerlendirme ve Raporlama Tekniği Kısa Formu (CHART-SF) ile analiz edildi.

Bulgular: Hastaların yaş ortalaması hemodiyalizde 39,40±6,81 yıl, omurilik yaralanması grubunda 36,17±8,92 yıl idi (p>0,05). CHART alt grup analizi hemodiyaliz ve parapleji grubunda şu şekildedir; fiziksel bağımsızlık düzeyi 89,20±21,43 ve 77,87±33,25 (p>0,05); bilişsel değerlendirme 91,97±18,15 ve 77,63±33,25 (p<0,05*); hareketlilik 76,23±11,14 ve 70,10±23,68 (p>0,05); rol ve etkinlik durumu 24,58±35,10 ve 38,75±40,22 (p>0,05); sosyal katılım 70,37±16,30 ve 64,37±22,64 (p>0,05).

Sonuç: Hemodiyaliz hastalarında fiziksel bir engel durumu olmamasına rağmen, engellilik derecesinin şiddetinin paraplejik hastalar kadar yüksek olduğu düşünülmektedir.

Anahtar sözcükler: Kronik böbrek yetmezliği; engellilik; hemodiyaliz; spinal kord yaralanması.

Chronic kidney disease is a life-threatening situation; the disease is followed by end-stage renal disease (ESRD), which seems to rise over the next decade due to the aging population, and the increasing prevalence of hypertension and diabetes in all countries.[1]

In recent decades, improvements in dialysis technology rise the survival rate of ESRD patients.[2] Although hemodialysis (HD) may extend life, it often fails to restore quality of life. ESRD negatively affects patients' quality of life due to impairment and limitations in daily life activities or disability.[3] These situations may result in reduced quality of life and handicap.[4]

Spinal cord injury is a disabling chronic health condition affecting functionality, and physical, physiological, and social well-being due to injury and complications.[5] These persons acquire disabilities, in which a disease leads to a disability, incapacity, and handicap. Spinal cord injury is a well-known disease as a cause of disability.[6]

Many studies have highlighted the comparison of dialysis patients with age-matched control groups or different age groups. However, no other comparison was made before between groups of HD patients and spinal cord injury patients whose level of disability is widely accepted as high. The aim of this study was to analyze the disability of HD patients and to compare it with the paraplegia group which was a well-known disability group.

Methods

Thirty HD patients who were treated at Baskent University Hospital HD Section were enrolled in the study. The inclusion criteria for this group were to be between 18 and 50 years, to have chronic renal disease, and to receive HD for more than 6 months. Sociodemographical characteristics of patients, brief personal information, and the period and cycle of their HD treatment were recorded. The Turkish version of the Craig Handicap Assessment and Reporting Technique Short Form (CHART SF) analyzed the state of disability of the group. The exclusion criteria were mental disorders such as dementia, the presence of cancer, physical disorders causing handicaps such as amputation or hemiplegia, any other neurological disorders, and hospitalization during the research period. The total number of HD patient who had inclusion criteria was 30 patients in the HD unit. On the other hand, 30 age-matched paraplegic patients due to spinal cord injury were included in the study as the control group. All spinal cord injury patients were paraplegia patients injured lower thoracic and lumbar region with an Asia impairment scale of A or B.

The CHART SF was developed to provide a simple, objective scale of the degree to which impairment, and disability result in handicaps in the years following initial rehabilitation. There are six dimension handicaps in the CHART SF questionnaire which was described by the World Health Organization: (1) Physical independence, (2) cognitive independence, (3) mobility (4) occupation, (5) social integration, and (6) economic self-sufficiency.[7] In each subgroup, the scoring is between 0 and 100. The higher scores are related to the lower level of handicap. CHART SF is an objective and easy-to-apply self-assessment questionnaire.[6] In our study, the economic independence criterion is not evaluated due to insufficient input from the patients.

The study was approved by Başkent University Institutional Review Board and Ethics Committee. It was approved by the Ethical Review Committee of the same institution and followed the ethical principles reported in the Declaration of Helsinki (decision number 09/309). Written consent was obtained from all participants.

Statistical Analysis

The results were expressed as means of ± standard deviation. Mann–Whitney U-test was used for the comparison of demographic data and disability scores of CHART-SF between the two groups. The level of statistical significance was set as $p<0.05$.

Results

Demographic and clinical data for the patients are shown in Table 1. The mean age was 39.40±6.81 and 36.17±8.92 years in the HD and paraplegia groups, respectively ($p>0.05$). There were no significant differences between the two groups in terms of age, education, and marital status. The number of women was higher than the number of men in the paraplegic group. The duration of the disease was 56.03±61.30 and 162.5±112.18 months, in HD paraplegic patients, respectively ($p<0.05$).

According to the CHART SF questionnaire, the physical independence level was 89.20±21.43 and 77.87±33.25 in group HD and group paraplegia, respectively ($p>0.05$); the mobility was 76.23±11.14 and 70.10±23.68 in group HD and paraplegia, respectively ($p>0.05$); the score of roles and activities was 24.58.35.10±35.10 and 38.75±40.22 in group HD and

Table 1. Demographic characteristics of dialysis and paraplegia groups

	Hemodialysis group n=30	Paraplegic group n=30	p
Age (±SD [min-max])	39.40±6.81 (26–49)	36.17±8.92 (22–50)	0.142
Gender			0.010*
Female	12	22	
Male	18	8	
Education			0.404
Primary school	8	12	
Secondary school	9	6	
High school	10	10	
University	3	2	
Marital status			0.447
Married	14	13	
Single	15	12	
Divorced	1	5	

*p<0.05. SD: Standard deviation.

paraplegia, respectively (p>0.05); and social integration was 70.37±16.30 and 64.37±22.64 in group HD and paraplegia, respectively (p>0.05). However, the cognitive independence score was better in HD patients (91.97±18.15) than those in paraplegic patients (77.63±27.80) (p<0.05). The CHART SF questionnaire scores are shown in Table 2.

Discussion

The growing number of people will lead to ESRD and patients with ESRD requiring HD treatment.[1] These ESRD must adapt to new dependencies on medical professionals and equipment, and withstand multiple physiological and psychological stresses.[2,3] Time restrictions and the requirement for treatment limit their everyday activities.[2] These patients may also suffer severe functional impairment in daily living besides the pathologic nature of diseases such as irritation, fatigue, depression, anxiety, isolation, work-related problems, joint tenderness, bone pain, painful muscle spasms, and malnutrition.[8]

As we know, this was the first study comparing disability between dialysis and paraplegia groups. As it is well known, paraplegia due to spinal cord injury is a very severe disability. There were numerous studies about spinal cord injury and disability in those patients.

Gontkovsky et al.[7] suggested that handicaps of spinal cord injury patients by the score of physical independence were 47, cognitive independence 66.5, mobility 69.6, roles and activities 38.3, and social integration 72.8 on the CHART-SF scale. Roles-activities and mobility subscales scores were similar to our paraplegia group but worse in physical independence and cognitive independence, and better in the social integration subscale. In Gontkovsky's study, both paraplegia (11 patients) and tetraplegia (17 patients) patients were included in the study.

Putzke et al.[9] reported gunshot-caused and traumatic-caused spinal cord injury patients' handicaps with CHART. They reported the CHART scores as physical independence 80.0 and 82.6, mobility subscales were 74.3 and 74.1, roles and activities subscales were 48.9 and 48.0, and social integration subscales were 79.4 and 83.5 in by order of gunshot caused and traumatic caused spinal cord injury. These two groups were not statistically different from each other. But these four subscales of CHART were better than paraplegia patients' CHART scores in our investigation.

The physical performance of dialysis patients has been assessed in various studies. Performance deficits include decreased aerobic capacity, muscular strength, balance, flexibility, and lower extremity function loss, especially in obese patients.[10,11] Yavuz revealed that the ESRD population has difficulty with ambulation and coordination of hand movement.[12] Leinau suggested that in dialysis patients, the

Table 2. CHART-SF values of dialysis and paraplegic group

	Hemodialysis patients n=30 (min–max)	Paraplegia n=30 (min–max)	p
Physical independence	89.20±21.43 (4–100)	77.87±33.25 (4–100)	0.261
Cognitive independence	91.97±18.15 (37–100)	77.63±27.80 (15–100)	0.017*
Mobility	76.23±11.14 (62–97)	70.10±23.68 (0–100)	0.310
Roles and activities	24.58±35.10 (0–100)	38.75±40.22 (0–100)	0.144
Social independences	70.37±16.30 (31–100)	64.37±22.64 (29–100)	0.340

*p<0.05. CHART-SF: Craig Handicap Assessment and Reporting Technique Short Form.

prevalence of impaired physical performance and fatigue was high.[13] In this study, dialysis patients' physical dependence levels were similar to paraplegic patients.

Depression and cognitive impairment rates are higher than the general population in HD patients estimated % at 20–30 and 58.2, respectively.[14,15] HD patients' depression affects the quality of life, functional impairments, comorbid conditions, and long-term body pain.[16] The cognitive impairment reasons are not definite in dialysis patients, but vascular disease, uremic neurotoxicity, chronic inflammation, oxidative stress, anemia, and risks associated with dialysis itself (e.g., intradialytic cerebral ischemia and dialysis disequilibrium syndrome) may be some causes. Zweien suggested that dialysis patients may be particularly impaired in cognitive functions including attention, processing speed, and working memory.[17]

Dialysis patients face many restrictions such as limited diet and liquid intake and strictness of the treatment regimen.[12] With restricted activity due to chronic fatigue and muscle cramps, the mobility of dialysis patients' is limited, which also decrease social contact.[4,12] On the other hand, spending 10–12 h each week away from home, and frequent contact with caring dialysis staff and other patients may provide a welcomed source of socialization for many dialysis patients who have limited access to outside activities.[13] To provide socialization for dialysis patients, dialysis services must be designed for supporting the social interactions of patients.[12]

We think that dialysis patients have more opportunities for going out and meeting new people compared to paraplegic patients. This is a chance for a dialysis patient to have a better psychological state. Therefore, these obligatory visits should be planned more effectively. The best way to improve cognition in HD patients is through group-based cognitive behavioral interventions. The advantages of this intervention are less time per patient, the inability to individualize interventions, and group conflict.[18]

Marlowe presented that less than one-third of dialysis patients are employed or enrolled in an educational institution.[19] Due to frequent visits to the hospital for dialysis treatment, the patients did not have enough time for employment or being enrolled in an educational institution.[12]

In this study disease, the duration of both groups was statistically different. Disease duration was longer in the paraplegia group. In a study, Celik et al.[20] concluded that increased duration of ESRD is correlated with worse comorbidities in HD patients. Furthermore, they stated that older HD patients have higher disability levels than younger patients. In this study, considering these results, Young HD patients (under age 50) were included in the study.

In fact, HD patients do not have physical impairment in this study. This study showed that there were no differences between HD and paraplegic patients in terms of independency, mobility, roles, and activities. We suggest that chronic fatigue and physical dependency on a HD machine 3 times a week were very important factors for integrating daily living activities. On the other hand, HD patients have better cognitive function than those spinal cord injury patients.

Conclusion

The results of this study showed that the dialysis patients did have not any statistically different scores in physical independence, social integration, mobility, and roles and activities; on the other hand, they were better in cognitive independence than paraplegia patients.

Disclosures

Ethics Committee Approval: The study was approved by Başkent University Clinical Research Ethics Committee, Date: 05.08.2009, decision number: 9/309.

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Conflict of Interest: None declared.

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