Assessment of Falls in Older People: Is There any Association Between Restless Legs Syndrome and Falls ?

Yaşlılarda Düşmenin Değerlendirilmesi: Huzursuz Bacak Sendromu ile Düşme Arasında İlişki Var mı ?

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Abstract

Objectives: The incidence of falls increases with age and due to several age-related chronic conditions. Restless legs syndrome (RLS) might be a potential risk factor for falls since it is a sensorymotor disorder. It is associated with paresthesias and motor restlessness which may cause sleep problems. The aim of this study is to evaluate the effect of restless legs syndrome on falls among geriatric patients and identify the other risk factors for falls.

Materials and Methods: This is a cross sectional study including patients 65 years and older. The diagnosis of RLS was established with 2012 International Restless Legs Syndrome Study Group criteria. Patients were evaluated with comprehensive geriatric assessment. The association between falls and RLS and geriatric conditions was evaluated with binominal logistic regression analysis.

Results: There were total 70 patients in the study. 44.3% of patients were living in the long term care facility. There were 39 females. The rate of RLS was 15.7%. The number of falls in the last one year was 24.3%. The rate of comorbidity and polypharmacy was 37.1% and 65.7% respectively. Fifteen patients were dependent on activities of daily living (ADL) and 40% had positive timed up and go (TUG) test. Possible depression and cognitive impairment rate was found 47.1% and 38.6% respectively. The association between falls and RLS and positive TUG test was found statistically significant (p=0.041, OR=6.59 and p=0.046, OR=6.31 respectively).

Conclusion: Our study revealed that RLS is a risk factor for falls in elderly. It is essential to address and modify the underlying risk factors including RLS in older patients. This finding would increase the awareness of physicians about RLS as a risk factor for falls. Also the association between falls and positive TUG test has been found statistically significant. Our study suggests that performing TUG test should be an essential part of fall evaluation.

Key words: Restless legs syndrome, falls, geriatric assessment, older people, timed up and go (TUG) test

Öz

Amaç: Düşme riski yaşlı hastalarda ileri yaşa eşlik eden komorbid hastalıklar nedeni ile yüksektir. Sensörimotor bir bozukluk olan huzursuz bacak sendromu (HBS) parestezi ve motor semptomlar ile karekterize olup uyku bozukluklarına yol açar. Bu çalışmanın amacı geriyatrik hastalarda huzursuz bacak sendromunun düşmeler üzerine etkisini ve düşmelerle ilişkili diğer risk faktörlerini araştırmaktır.

Materyal ve Metot: Çalışmamız kesitsel olup 65 yaş ve üzeri hastaları kapsamaktadır. HBS tanısı Uluslararası Huzursuz Bacak Sendromu Çalışma Grubu, 2012 kriterlerine göre konulmuştur. Hastalar kapsamlı geriyatrik muayene ile değerlendirilmiştir. HBS, geriyatrik problemler ve düşmeler arasındaki ilişki binominal lojistik regresyon ile analiz edilmiştir.

Bulgular: Çalışmaya toplam 70 hasta alınmıştır. Hastaların otuz dokuzu kadın olup, %44.3'ü yaşlı bakım evinde kalmaktadır. Huzursuz bacak sendromu oranı %15.7'dir. Bir önceki yılda düşme oranı %24.3'tür.

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Komorbidite ve polifarmasi oranları sırasıyla %37.1 ve % 65.7'dir. Çalışmaya katılanların %21.4'ü günlük yaşam aktivelerinde (GYA) bağımlı bulunmuşken; %40'ında kalk ve yürü testi pozitiftir. Depresyon ve kognitif bozukluk tarama testleri sırasıyla %47.1 ve %38.6'sında pozitiftir. Huzursuz bacak sendromu, kalk ve yürü testi ile düşmeler arasındaki ilişki istatistiksel olarak anlamlı bulunmuştur (p=0.041, OR=6.59 ve p=0.046, OR=6.31).

Sonuç: Çalışmamız huzursuz bacak sendromunun yaşlı hastalarda düşmeler için bir risk faktörü olduğunu göstermiştir. Bu çalışma klinisyenlerin huzursuz bacak sendromunun bir düşme riski olabileceği konusundaki duyarlılığını arttıracaktır. Yaşlı hastalarda düşmelere sebep olan risk faktörleri araştırılıp, modifiye edilirken huzursuz bacak sendromu da göz önünde bulundurulmalıdır. Ayrıca düşme ve pozitif kalk ve yürü testi ilişkisi de anlamlı bulunmuştur. Bu bağlamda kalk ve yürü testi düşme değerlendirmesinin önemli bir parçası olarak ele alınmalıdır.

Anahtar kelimeler: Huzursuz bacak sendromu, düşme, geriyatrik değerlendirme, yaşlılar, kalk ve yürü testi

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Introduction

Restless legs syndrome (RLS) is a sensorymotor disease which may be idiopathic or secondary to different problems. Restless legs syndrome prevalence in adults is approximately 5 to 10 percent in Europe. In Asian populations RLS is not as common as Europe and around 1 to 4 percent.[1]

Restless legs syndrome is a sensorymotor disorder that is characterized with paresthesias and motor restlessness. It presents with strong urge to move the legs which worsens at night and reliefs by activity. RLS remains an under diagnosed clinical condition. RLS is a diagnosis based on patient history rather than physical examination which is usually normal; but in secondary RLS signs or symptoms of underlying etiologies might be found. The first criteria for the diagnosis of RLS was proposed by the International Restless Legs Syndrome Study Group (IRLSSG) in 2003 and then modified in 2012. [2-4]

Fall is defined as "an event which results in a person coming to rest inadvertently on the ground or floor or other lower level" by World Health Organization (WHO). Falls are major public health problem worldwide. The compensatory ability of older people decreases due to impairment of several domains with aging that eventually leads to falls. [5-7] Falls are the second top reason of accidental deaths among older people.

The fall incidence increases with age. The annual rate of falls is 30 to 40 percent among community-dwelling people who is older than 65 years and increases to almost 50 percent after age 80.[8-13] Fall related injuries are associated with increased morbidity, hospitalizations, subsequent nursing home replacement and decline in functional status impairment.[14-16]

The major risk factors for falls are age, being female, past history of a fall and cognitive impairment. Balance and gait problems, certain medications, especially psychotropic

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agents, orthostatic hypotension, history of cerebrovascular accident, osteoarthritis and vitamin D deficiency are other possible risk factors. Many risk factors including comorbid conditions and environmental problems for falls are modifiable. According to observational studies medications are the most important modifiable risk factor. The American Geriatrics Society (AGS) states that questioning history of falls is essential in order to prevent falls in the community. AGS recommends that all older people should be inquired about fall history annually.[17] Geriatricians and primary care physicians need to routinely inquire about falls, assess and address the underlying risk factors. Further evaluation is needed for patients who present with a fall or have a history of recurrent falls.

The fall risk increases in the elderly due to increased comorbidities as a part of aging. RLS might be a potential risk factor for falls since it is a sensorymotor disorder associated with paresthesias and might cause sleep problems in the elderly.

The aim of this study is to evaluate the effect of restless legs syndrome on falls among geriatric patients and identify the other geriatric conditions as risk factors for falls.

Materials and Methods

This is a cross sectional study including patient 65 and older. There were total of 70 patients in the study. Out of 70 patients 31 of them were long term care facility resident and 39 of them outpatient geriatric patients. The diagnosis of RLS was established with 2012 International Restless Legs Syndrome Study Group (IRLSSG) criteria. Exclusion criteria were immobility, severe dementia (Mini Mental State Examination is less than 11), chronic renal failure, known peripheral neuropathy, disability and hypocalcaemia.

Patients were evaluated with comprehensive geriatric assessment. Patients were questioned regarding their fall history in the last one year. Activities of daily living (ADL) which shows the ability of the patient to take care of himself was assessed. Mobility and gait assessed by Timed Up and Go Test (TUG) and mood assessed by Geriatric Depression Scale (GDS) which is designed as a screening tool for depression in elderly populations. GDS score equal to 5 and more is suggestive of depression. The number of medications and comorbid conditions were recorded from medical charts. Using of four or more medications by patients was defined as polypharmacy. Cognitive function was evaluated with Mini Mental State Examination (MMSE). Nutrition was evaluated with Mini Nutrition Assessment (MNA) test. Urinary Incontinence (UI) was assessed with International Consultation on Incontinence Questionnaire-Short Form.

SPSS.20 software was used for the statistics of the study. Demographic characteristics of participants were analyzed with descriptive statistics. The association between falls and RLS, ADL, TUG, depression, cognitive function, nutrition status, polypharmacy, comorbid conditions and urinary incontinence was evaluated with binominal logistic regression analysis. The association between the variables were considered significant when $p < 0.05$.

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Results

There were total 70 patients in the study. 44.3% of patients were living in the long term care facility (LTC). There were 39 females (55.7%). The outcomes of geriatric assessment were shown in Table 1.

Table 1. Geriatric Assessment of Participants

n=70	% (n)
RLS	
Positive	15.70 (11)
Negative	84.30 (59)
FALLS	
Positive	24.30 (17)
Negative	75.70 (53)
COMORBIDITY	
≥ 2 comorbidity	37.10 (26)
< 2 comorbidity	62.90 (44)
POLYPHARMACY	
≥ 4 medication	65.70 (46)
< 4 medication	34.30 (24)
ADL	
Dependent	21.40 (15)
Independent	78.60 (55)
TUG TEST	
Positive	28 (40)
Negative	42 (60)
GDS	
Positive	47.10 (33)
Negative	52.90 (37)
MMSE	
Positive	38.60 (27)
Negative	61.40 (43)
MNA	
Positive	44.30 (31)
Negative	55.70 (39)
UI	
Positive	38.60 (27)
Negative	61.40 (43)

RLS=Restless Leg Syndrome, ADL=Activities of daily living, TUG= Timed Up and Go, GDS=Geriatric Depression Scale, MMSE: Mini Mental State Examination, MNA: Mini Nutritional Assessment, UI: Urinary Incontinence

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The association between falls and RLS and positive TUG test was found statistically significant (p=0.041, OR=6.59 and p=0.046, OR=6.31 respectively). The association between falls and the rest of the parameters was statistically insignificant (Table 2).

Table 2. The Association Between Falls and RLS and Geriatric Assessment Domains with Logistic Regression Analysis

	p value	Odd Ratio	95% CI	
			Lower	Upper
GENDER	0.748	0.78	0.17	3.54
ADL	0.473	0.47	0.06	3.58
TUG	0.025	6.31	1.25	31.68
POLYPHARMACY	0.260	3.67	0.38	35.33
COMORBIDITY	0.352	2.47	0.36	16.66
GDS	0.109	3.79	0.74	19.35
MMSE	0.500	0.47	0.05	4.16
MNA	0.184	0.27	0.03	1.86
UI	0.855	0.84	0.14	4.93
LTCF RESIDENT	0.400	2.24	0.34	14.87
RLS	0.041	6.59	1.08	40.22
Constant	0.003	0.02		

ADL: activities of daily living, TUG: Timed Up and go Test, GDS: Geriatric Depression Scale, MMSE: Mini Mental State Examination, MNA: Mini Nutrition Assessment, UI: Urinary Incontinence, LTCF: Long term care facility, RLS: Restless Legs Syndrome

Discussion

Falls are one of the major public health problem in the community. It is important to identify the older patients who are at risk for falls in order to prevent it effectively and adequately. Clinicians encourage to use falls risk screening tools to find out underlying conditions that lead to falls. Many of these conditions are preventable and modifiable. To the best of our knowledge, this is one of the first studies evaluating the association between RLS and falls in older people. In this study the association between RLS and falls was found statistically significant. We identified that RLS is a risk factor for falls in geriatric population.

The incidence of falls increases with age and due to several age-related chronic conditions. Our study suggests that during the evaluation of falls in elderly, another important parameter to be considered is RLS. Studies revealed that RLS may cause sleep problems, depression and anxiety. Sleep related problems and paresthesias that are associated with RLS might be the reason of high fall risk. The underlying mechanism that is causing RLS related falls should be evaluated with further studies.

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RLS can be categorized as primary and secondary. Primary RLS typically manifests before the age of 45 years and has a strong genetic component. Secondary RLS is associated with other coexisting disorders such as iron deficiency, peripheral polyneuropathy, obesity, diabetes mellitus, multiple sclerosis, rheumatoid arthritis, Parkinson's disease, end-stage renal disease, fibromyalgia, chronic obstructive pulmonary disease, obstructive sleep apnea, migraine, chronic liver disease, and depression.[18] All of these conditions are most frequently seen in older adults. According to our study appropriate diagnosis and management of RLS is necessary to prevent falls in elderly people. Therefore, the importance of fall prevention education in elderly RLS patients is crucial.

Another important finding of our study is that positive TUG test has been shown associated with falls. A systematic review about TUG and fall association suggests that TUG alone should not be used to predict the fall risk of older adults.[19] On the other hand, a recent study has demonstrated, TUG test distinguishes older women with low and high risk for falls and suggest that it should be performed during the fall assessment.[20] History of falls, balance and gait problems and specific medications has been found valuable as prognostic factors by some studies.[21,22]

In the light of these information, our study suggests that TUG test is helpful to identify the older people who are at increased risk for falls. Therefore one might suggest that this test should be consider as a potential screening tool for older patient with high risk for falls. It is an easy and quick test to carry out. It should be used in conjunction with other geriatric assessment tools. To validate this hypothesis larger and well control studies should be conducted.

There was no significant difference between the long term care facility residents and geriatric outpatients regarding fall incidence. No gender difference has been shown. Also no association with falls and other geriatric conditions has been found statistically significant.

Conclusion

Our study revealed that RLS is a risk factor for falls in older people. It is essential to address and modify the underlying risk factors including RLS in older patients. This finding would increase the awareness of physicians about RLS as a risk factor for falls. Also the association between falls and positive TUG test has been found statistically significant. Our study suggests that performing TUG test should be an essential part of fall evaluation.

References
1. Ohayon MM, O'Hara R, Vitiello MV. Epidemiology of restless legs syndrome: a synthesis of the literature. Sleep Med Rev 2012;16(4):283-95.
2. Allen RP, Picchietti D, Hening WA, Trenkwalder C, Walters AS, Montplaisi J. Restless legs syndrome: diagnostic criteria, special considerations, and epidemiology. A report from the restless legs syndrome diagnosis and epidemiology workshop at the National Institutes of Health. Sleep Med 2003;4(2):101-19.
3. International Restless Legs Syndrome Study Group, 2011 revised diagnostic criteria.

4. Allen RP, Picchietti DL, Garcia-Borreguero D et al. Restless legs syndrome/Willis-Ekbom disease diagnostic criteria: updated International Restless Legs Syndrome Study Group (IRLSSG) consensus criteria--history, rationale, description, and significance. Sleep Med 2014;15(8): 60-73.
5. Pasquetti P, Apicella L, Mangone G. Pathogenesis and treatment of falls in elderly.Clin Cases Miner Bone Metab 2014;11(3):222-5.
6. Carlson C, Merel SE, Yukawa M. Geriatric syndromes and geriatric assessment for the generalist. Med Clin North Am 2015;99(2):263-79.
7. Tchalla AE, Dufour AB, Travison TG et al. Patterns, predictors, and outcomes of falls trajectories in older adults: the MOBILIZE Boston Study with 5 years of follow-up. PLoS One. 2014;9(9):e106363.
8. Luk JK, Chan TY, Chan DK. Falls prevention in the elderly: translating evidence into practice. Hong Kong Med J 2015;21(2):165-71.
9. Trombetti A, Reid KF, Hars M. et al. Age-associated declines in muscle mass, strength, power, and physical performance: impact on fear of falling and quality of life. Osteoporos Int 2016;27(2):463-71.
10. Tinetti ME. Clinical practice. Preventing falls in elderly persons. N Engl J Med 2003;348(1):42-9.
11. Jodaitis L, Vaillant F. et al. Orthostatic hypotension and associated conditions in geriatric inpatients.Acta Clin Belg 2015;70(4):251-8.
12. Cattagni T, Scaglioni G, Cornu C, Berrut G, Martin A. What are the effects of the aging of the neuromuscular system on postural stability? Geriatr Psychol Neuropsychiatr Vieil. 2015;13(4):363-80.
13. Chang JT, Morton SC, Rubenstein LZ et al. Interventions for the prevention of falls in older adults: systematic review and meta-analysis of randomized clinical trials. BMJ 2004;328(7441):680.
14. Tinetti ME, Williams CS. The effect of falls and fall injuries on functioning in community-dwelling older persons. J Gerontol A Biol Sci Med Sci 1998;53(2):M112-9.
15. Gupta S, Gupta SK, Devkota S. et al. Fall Injuries in Nepal: A Countrywide Population-based Survey. Ann Glob Health 2015;81(4):487-94.
16. Kim SB, Zingmond DS, Keeler EB. et al. Development of an algorithm to identify fall-related injuries and costs in Medicare data. Inj Epidemiol 2016;3:1. Epub 2016 Jan 5.
17. American Geriatrics Society, British Geriatrics Society. 2010 AGS/BGS Clinical Practice Guideline: Prevention of Falls in Older Persons. New York: American Geriatrics Society; 2010.
18. Katsi V, Katsimichas T, Kallistratos MS, et al. The association of Restless Legs Syndrome with hypertension and cardiovascular disease. Med Sci Monit 2014;20:654–59.
19. Emma Barry, Rose Galvin, Claire Keogh, Horgan F, Fahey T. Is the Timed Up and Go test a useful predictor of risk of falls in community dwelling older adults: a systematic review and meta- analysis. BMC Geriatr 2014;14:14.
20. de Souza Moreira B, Mourão Barroso C, Cavalcanti Furtado SR, Sampaio RF, Drumond das Chagas e Vallone ML, Kirkwood RN. Clinical functional tests help identify elderly women highly concerned about falls. Exp Aging Res 2015;41(1):89-103.
21. Ganz DA, Bao Y, Shekelle PG, Rubenstein LZ. Will my patient fall? JAMA 2007;297(1):77-86.
22. Aizenberg D, Weizman A, Weiss A, Akopian M, Amitai M, Beloosesky Y. The Association in Elderly Hospitalized Patients, Between Psychotropic Drugs and Hip Fractures Resulting from Falls. Exp Aging Res 2015;41(5):546-55.