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Comparison of Functional Status and Depression in Younger and Older Patients with Chronic Low Back Pain: A Multi-center Cross-sectional Survey

Kronik Bel Ağrılı Genç ve Yaşlı Hastaların Fonksiyonel Durum ve Depresyon Açısından Karşılaştırılması: Çok Merkezli Kesitsel Bir Araştırma

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Abstract

Objective: This study compared the differences in functionality and depression between younger and older patients with chronic low back pain (CLBP).
Materials and Methods: This multi-center cross-sectional survey enrolled subjects with CLBP who visited physical medicine and rehabilitation clinics in seven different regions of Turkey. Sociodemographic data were collected via questionnaires. Functional status was evaluated with Roland-Morris Disability index (RMDI), and psychological health was evaluated with Beck Depression inventory (BDI).
Results: The sample included 106 younger [mean age: 24.3 (range: 18-30) years] and 104 older [mean age: 70.5 (range: 65-108) years] subjects. No significant difference was found in the gender distribution between the younger (38 males, 68 females) and older (38 males, 66 females) groups (p=0.917). The BDI was 11.90±10.6 in the younger subjects and 16.17±10.72 in the older subjects (p=0.002), whereas the mean RMDIs were 10.31±6.36 and 16.04±5.36, respectively (p=0.001).
Conclusion: The loss of functional capacity and depression resulting from CLBP are serious threats to public health and are predictive of chronic disability. The development of social programs that address risk factors will reduce the risk of CLBP, improve quality of life, reduce workforce losses and contribute significantly to public health.
Keywords: Low back pain, functional capacity, geriatrics, depression, public health

Öz

Amaç: Bu çalışmada genç ve yaşlı kronik bel ağrılı (KBA) hastaların fonksiyonellik ve depresyon açısından farklılıkları karşılaştırılmıştır.
Gereç ve Yöntem: Bu çok merkezli kesitsel çalışmaya, Türkiye'nin 7 bölgesindeki farklı fiziksel tıp ve rehabilitasyon polikliniklerine başvuran KBA'lı 106 genç 104 yaşlı hasta dahil edilmiştir. Sosyodemografik veriler anketler yoluyla toplanmıştır. Fonksiyonel durum Roland-Morris Dizabilite anketi (RMDA) ile, psikolojik sorgulama ise Beck Depresyon anketi (BDA) ile değerlendirilmiştir. İstatistiksel analizler IBM SPSS Statistics 22 paket programıyla yapılmıştır.

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Öz

Bulgular: Çalışmamıza 106 genç [ortalama yaş: 24,3 (18-30)] ve 104 yaşlı [ortalama yaş: 70,5 (65-108)] hasta katıldı. Cinsiyet dağılımı açısından genç (68 kadın, 38 erkek) ve yaşlı hasta (66 kadın, 38 erkek) grupları arasında anlamlı bir farklılık yoktu (p=0,917). BDA sonuçları gençlerde 11,90±10,6 iken yaşlı hasta grubunda 16,17±10,72 bulunmuşken (p=0,002), RMDA ortalamaları geçlerde ve yaşlılarda sırasıyla 10,31±6,36 ve 16,04±5,36 olarak bulundu (p=0,001).

Sonuç: KBA sık karşılaşılan, fonksiyonel ve psikolojik problemlere yol açtığı bilinen bir hastalıktır. Bel ağrısı kaynaklı fonksiyon kaybı ve depresyon ciddi halk sağlığı problem ve kronik dizabilitenin belirleyicilerindendir. KBA gelişimini engelleyecek risk faktörlerinin belirlenmesi ve buna yönelik sosyal programların geliştirilmesi, hassas kişilerde yaşam kalitesini artıracak, iş gücü kaybını azaltacak ve halk sağlığına önemli olumlu etkileri olacaktır.

Anahtar kelimeler: Bel ağrısı, fonksiyonel kapasite, geriatri, depresyon, halk sağlığı

Introduction

International Pain Studies Association describes pain as; "An unpleasant sensory and emotional experience associated with actual or potential tissue damage". Chronic pain, lasting more than 3 months, is a subjective and multidimensional experience with sensory, emotional, behavioral and cognitive components that require long-term treatment (1).

Chronic low back pain (CLBP) is a complex disease that we encounter frequently, and is associated with serious consequences, such as physical disability and psychosocial disorders like anxiety, depression, and fear of participating in activities (2). Approximately 80% of people experience low back pain in their lifetime, and most of them will experience a recurrent or new LBP episode within 1 year (3). Depression and anxiety often exist among patients with LBP. Some studies mentioned about mechanisms, especially focusing on the mechanisms in the central and peripheral nervous system, which are commonly seen in herniated intervertebral disc and major depressive disorder (4).

CLBP is a common debilitating problem in people aged 65 and over. The known prevalence of LBP in older populations is between 13% and 49% (3). The incidence CLBP related disability in the general population is 65%, and disability-related factors include the work situation, low self-esteem, and depression (5). Studies comparing the functional status and depression of young and old people with CLBP have increased over time (6-8). Older people are inadequately represented, even when different age categories are compared, and patients over 65 years were clearly excluded in several studies (9).

Information about disability is essential for rehabilitation specialists and other healthcare professionals working with CLBP patients. It may be associated with chronic pain, insomnia, nausea, and depression and may be comorbid or secondary. Leading to a decrease in effectiveness, resulting in medical, social and may emerge as an economic problem. In general, policymakers and healthcare providers assume that the rate of weak-to-moderate disability and depression in the population is the same in young and old people (10,11). It has been reported that the incidence of depression in patients with chronic pain varies between 10-100%, usually above 50% (12). However, these studies are usually performed on samples that are heterogeneous in terms of age or on middle-aged people, and it is doubtful whether the disability and depression levels are the same in young and old populations because they have not been compared. Information from recent epidemiological studies suggests that CLBP influences the physical functioning of younger and older people differently (13,14).

Identifying the factors associated with CLBP can help to improve rehabilitation care and improve patients' quality of life (15). It was aimed to compare functional disability and depression in young and old patients with CLBP and to close a gap in the literature.

Materials and Methods

This was a multi-center cross-sectional survey of patients with CLBP who presented to physical medicine and rehabilitation (PM&R) outpatient clinics in seven different regions of Turkey. The research was prepared in accordance with the Declaration of Helsinki. Ethics committee permissions and preliminary preparation of the study were reviewed and approved by İstanbul Medeniyet University Göztepe Training and Research Hospital Institutional Review Board (decision no: 20/G, date: 20.03.2012). Written informed consent was obtained from all patients to participate in the study.

Patients

The study was conducted by 10 PM&R specialists from seven geographic regions of Turkey (Marmara Anatolian, Marmara European, Central Anatolia, Aegean, Black Sea, Mediterranean, Eastern Anatolia, and Southeastern Anatolia) from August 2012 through January 2013. The study enrolled 210 patients who suffered from mechanical LBP on at least half the days over the previous 3 months. Patients with an acute fracture, neoplasia, infection, or LBP radiating from the abdominal and pelvic organs or due to pregnancy were not included in the study. None of the patients recruited for the study declined to participate.

Outcome Measures

Sociodemographic characteristics (age, gender, and body mass index) and clinical information (diagnosis, duration of disease, and treatments received) were recorded during face-to-face interviews at the first visit. The Roland-Morris Disability index

(RMDI) was used to assess functional status, and the Beck Depression inventory (BDI) was used to assess psychological health. The RMDI and BDI questionnaires filled out by patients after the first visit.

Roland-Morris Disability Index

The RMDI is a reliable, valid health status measure designed to be filled in by patients themselves to assess the physical disability associated with LBP. The index was originally designed to be used in research (i.e., as a benchmark for clinical trials), but it has also been helpful in clinical practice for monitoring patients. The RMDI is short, easy to fill and easily understood by patients. The RMDI score is calculated as the sum of the number of items checked by patients, and scores range from 0 (no disability) to 24 (maximum disability) (16,17).

Beck Depression Inventory

The BDI is a self-reported measure of depressive symptoms including 21 items with confirmed reliability and validity. Each item is scored from 0 to 3, and the maximum possible total score is 63. A score of 0-4 is considered normal, one of 5-13 is considered to reflect borderline clinical depression, one of 14-20 is considered to reflect moderate depression, and one of 21-63 is considered to reflect severe depression. The BDI is a screening tool and is not used for diagnosis (18). The validity and reliability of the BDI for the Turkish population was conducted by Teğin (19).

Statistical Analysis

The statistical analysis was performed using IBM SPSS Statistics 22 (IBM SPSS, Turkey). The fit of the data to a normal distribution was evaluated using the Shapiro-Wilk test. Quantitative analyses (means, standard deviations, and frequencies) were also performed. Student's t-test was used to compare two groups with normally distributed parameters, and data that were not normally distributed were compared with the Mann-Whitney U test. Qualitative data were compared with the chi-square test and the Yates continuity correction.

Statistical significance was set at $p<0.05$ at $\alpha=0.05$ significance.

Results

In total, 106 patients were younger (18-30 years) and 104 were older (65-88 years). Patients included in the study were diagnosed with chronic mechanical low back pain in accordance with the exclusion criteria. None of them had received any surgical or interventional treatment. There were no differences in the treatments used (non-pharmacological treatments such as physical therapy or bracing, pharmacological treatments such as simple analgesics and non-steroidal anti-inflammatory drugs). Other findings related to demographic characteristics of the patients are shown in Table 1. The mean BDI and RMDI scores are seen in Table 2.

Discussion

Pain helps to regulate object relations and plays a symbolic role in communication with the person's environment. In some patients, pain can be interpreted as punishment. The subconscious is accompanied by a sense of guilt. The death of the person invested with love can initiate pain. Various factors such as childhood neglect and suppressed aggression have also been described in chronic pain patients, and it has been reported that anger and hostility play an important role in the development and continuation of pain. Anger expression is one of the issues emphasized in these patients. According to this view; chronic pain is caused by the patient's desire to suppress

Table 1. Demographic characteristics of patients

	Young patients (n=106) mean ± SD	Geriatric patients (n=104) mean ± SD	p-value
Age (years)	24.3 (±3.99)	70.5 (±5.19)	**0.001****
Height (cm)	167.35 (±8.1)	162.44 (±8.5)	[1]**0.001****
Weight (kg)	65.31 (±12.16)	75.42 (±12.14)	[1]**0.001****
BMI (kg/m^2)	23.28 (±3.86)	28.73 (±5.13)	[1]**0.001****
Duration of LBP (months)	35.54 (±83.33)	90.25 (±126.78)	[2]**0.001****
Sex (female/male)	68/38	66/38	[3]**0.917****

[1]Student t-test, [2]Mann-Whitney U test, [3]Chi-square test ve continuity (Yates) correction, **p<0.01. BMI: Body mass index, LBP: Low back pain, SD: Standard deviation

Table 2. RMDI and BDI scores of groups

	Young patients mean ± SD (median)	Geriatric patients mean ± SD (median)	p-value
RMDI	10.31±6.36 (9)	16.04±5.36 (16.5)	**0.001****
BDI	11.90±10.6 (11)	16.17±10.72 (14)	**0.002****

Mann-Whitney U test, **p<0.01. RMDI: Roland-Morris Disability index, BDI: Beck Depression inventory, SD: Standard deviation

intense anger, and this inward anger is more common than healthy controls (20).

This study examined whether the associations between LBP and depression and disability differ in younger and older individuals. Other studies have revealed a weak-to-moderate association between LBP and physical disability (7,9), and our results are consistent with these findings. In our study, the association between these two variables was significantly stronger in older patients.

To our knowledge, only Houde et al. (21) have evaluated whether the disability status of those with LBP is influenced by age. They enrolled 164 patients with LBP and reported that physical disability (measured using the Oswestry Disability index) was considerably higher in younger patients. However, the groups in their study were divided according to median age into younger (n=82; age: 22-48 years) and older (n=82; age: 49-90 years) groups. We believe that their older group does not represent geriatric patients. Our study groups comprised younger patients, aged 18-30 years, and a geriatric group, aged 65-88 years. Unlike Houde et al. (21), we found considerably higher physical disability scores in the older group. Within the scope of the research, studies in the literature were examined on an empirical basis in order to evaluate chronic pain in elderly patients. A conceptual model has been obtained. In the study conducted to examine the relationship between pain phenotypes and depression, neuroticism, a positive correlation was found between pain and major depression research focuses on studies investigating the molecular features of the comorbid relationship between chronic pain and mood disorders, especially major depressive disorders (12).

Some studies have reported that restriction of activities was directly related to advancing age, and the oldest age groups were those with the highest mobility restrictions (22). In a 2-year prospective study evaluating associations among chronic pain, functioning, depression, and healthcare utilization in 169 older adults, Mossey and Gallagher (23) reported that 37.7% had pain leading to moderately-to-severely impaired functioning. Furthermore, the pain that was present at the beginning of the study process and continued over the 2 years, increasing the risks of depression and impaired functioning and leads to increased use of health services. Back pain is a common condition of major social importance and poorly understood pathogenesis (24). Buchbinder et al. (13) researched the effect of age on the burden of disability in LBP patients and reported a higher burden of disability per capita in geriatric age groups. Our results concur with these studies.

Chronic pain also brings with it psychiatric disorders, most commonly depression. The relationship between chronic pain and depression is complex (25). Corran et al. (26) proposed that younger patients be classified as having a "positive adaption to pain" (high level of pain with low levels of depression and functional impact), "chronic pain syndrome" (high levels of pain with functional impact and depression), or "good pain control" (low levels of pain and low impact). An additional category, called "high impact" and characterized by low levels of pain but high levels of functional impact and relatively high levels of depression, was identified in about 25% of older patients. The most plausible explanation for this discrepancy is the higher incidence of comorbidities in older patients, which alters the effects of pain on functioning and mood. Although we did not check X-rays or the bone mineral densities of our patients, degenerative changes in the spine and osteoporosis are prevalent in older patients and would contribute to their high physical dysfunction and depression scores. Within the scope of the research conducted by Groenveld at al. (27), a method based on behavioral therapy was applied to patients with moderate to severe pain in the pain clinic. Visual reality (VR) practice for at least 10 minutes a day for 4 weeks the control group received standard care. As a result of this application, it was found that anxiety and depression decreased and VR application increased the quality of life (27).

Although we couldn't find an article that compares depression in younger and older CLBP patients, depression frequently accompanies LBP (28) and is commonly associated with increased physical and psychological disability (29). In a review, Linton (30) reported that depression was associated with chronic pain syndromes in 88% of the studies reviewed. Older patients with chronic pain are also at high risk of depression, and this is the case whether they live in a nursing home or the community (31). Onat et al. (32) found that advanced age was a risk factor for depression in older individuals. They showed that the functional situation deteriorates with aging, and poor functioning poses a risk for depression. This vicious cycle is another explanation for our results. Although a strong association between pain and depression has been reported, we could not find any comparative study in terms of age. Mesci et al. (33) investigated the sensitivity of younger and older people to painful stimuli and studied the impact of aging on pain perception and depression. However, they didnot find a difference in pain sensitivity and depression between younger and older individuals. They studied healthy groups, whereas our patients were CLBP patients.

The most important limitation of this study is that our participants were recruited from tertiary health centers. Although we recruited patients from all regions of Turkey, it is possible that our patients were referred for treatment because they were more disabled. However, as the health policies in Turkey allow anyone to visit any hospital they choose, even patients living in a rural area can apply directly to a university hospital. Therefore, our results apply to the entire CLBP population in Turkey.

The design of the study focuses on the depression with only considering the low-back pain aspect. It is known that advanced age is a risk for depression, as well as chronic pain as we emphasized in the article. Moreover, the increased load of comorbidities as well as treatments for both low back pain and these comorbidities can contribute to the severity of the depression. The study lacks a through psychiatric evaluation for possible factors and only rely on an inventory.

Although comorbidities and the treatments received by the patients for their comorbidities are important, no analysis has been performed. Since the main focus of our study was to compare young and elderly patients with CLBP in terms of function and depression, no analysis was made with the assumption that older age naturally comes with more comorbidities. Such an analysis will be needed to evaluate the elderly patient group in itself.

Conclusion

To the best of our knowledge, this is the first study to examine whether there is a relationship between physical disability and depression in patients with CLBP is influenced by age. The results indicate that disability and depression are considerably more common in older patients with CLBP. Limitation of movement and loss of functional capacity caused by LBP are serious threats to public health as they are the precursors of chronic disability and increased risk of mortality. The development of social programs to address risk factors should reduce the risk for CLBP, improve the quality of life of vulnerable individuals, decrease workforce losses, and make a substantial contribution to public health.

Ethics

Ethics Committee Approval: Ethics committee permissions and preliminary preparation of the study were reviewed and approved by İstanbul Medeniyet University Göztepe Training and Research Hospital Institutional Review Board (decision no: 20/G, date: 20.03.2012).

Informed Consent: Written informed consent was obtained from all patients to participate in the study.

Authorship Contributions

Concept: Y.Y., Design: Y.Y., A.İ., N.F.T., G.K.K., Ö.K., Y.K., K.Ç., E.E., S.H., A.K., Data Collection or Processing: Y.Y., A.İ., N.F.T., G.K.K., Ö.K., Y.K., K.Ç., E.E., S.H., A.K., Analysis or Interpretation: Y.Y., A.İ., N.F.T., G.K.K., Ö.K., Y.K., K.Ç., E.E., S.H., A.K., Literature Search: Y.Y., A.İ., N.F.T., G.K.K., Ö.K., Y.K., K.Ç., E.E., S.H., A.K., Writing: Y.Y., A.İ., N.F.T., G.K.K., Ö.K., Y.K., K.Ç., E.E., S.H., A.K.

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