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A public health concern: Chronic low back pain and the relationship between pain, quality of life, depression, anxiety, and sleep quality

Bir halk sağlığı sorunu: Kronik bel ağrısı, ağrı, depresyon, anksiyete ve uyku bozukluğu ilişkisi

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Abstract

Aim: Chronic low back pain (CLBP) is a common condition of the musculoskeletal system and a public health concern. CLBP patients suffer from conditions such as muscle weakness and numbness, resulting in diminished quality of life (QoL), poor functioning, psychological disorders and sleep disorders related to disabling pain. The aim of the current study was to reveal relationship between CLBP and patients' health related QoL, anxiety, depression, and sleep disturbances.

Methods: Seventy-three patients with CLBP and 73 healthy controls participated in this questionnaire-based cross-sectional study. The Short form McGill Pain Questionnaire, Roland-Morris disability, Short form-36 (SF-36), Beck Depression (BDI) and anxiety inventory (BAI) and the Pittsburgh Sleep Quality Index (PSQI) were used in the study group, and SF-36, BDI, BAI and PSQI were used in the control group. The relationships between QoL, depression, anxiety, and sleep disorders were examined in the two groups.

Results: Two groups did not differ in terms of demographic characteristics ($P>0.05$). In the sub-scales of SF-36, except vitality and mental health, a significant difference was detected between the study and control groups ($P<0.001$). The depression, anxiety and PSQI scores did not differ between the two groups ($P>0.05$).

Conclusion: CLBP affects QoL negatively. This should be considered when managing CLBP.

Keywords: Chronic low back pain, sleep disorders, Quality of life

Öz

Amaç: Kronik bel ağrısı (KBA) sık görülen ve bir halk sağlığı sorunu olan kas iskelet sistemi bozukluğudur. KBA hastaları kuvvetsizlik, uyuşma, yaşam kalitesinde azalma, fonksiyonellikte azalma, depresyon ve anksiyete gibi psikolojik bozukluklar ve uyku bozukluğuna neden olan ağrı gibi semptomlardan şikayetçidir. Bu çalışmanın amacı, KBA ile hastalarda yaşam kalitesi, anksiyete, depresyon ve uyku bozuklukları arasındaki ilişkiyi ortaya koymaktır.

Yöntemler: Yetmiş-üç KBA olan hasta ve 73 sağlıklı kontrol bu anket bazlı kesitsel çalışmaya dahil edildi. Çalışma grubunda Kısa form McGill ağrı anketi, Roland-Morris özürlülük anketi, Kısa Form-36 S(F-36), Beck depresyon ve anksiyete ölçekleri ve Pittsburgh uyku kalitesi indeksi, SF-36, Beck depresyon ve anksiyete ölçekleri ve Pittsburgh uyku kalitesi indeksi ise kontrol grubunda uygulanmıştır. Yaşam kalitesi, depresyon, anksiyete ve uyku bozuklukları ilişkisi her iki grupta araştırılmıştır.

Bulgular: İki grup demografik özellikler açısından farklılık göstermemiştir ($P<0,05$). SF-36 altgruplarında canlılık ve mental sağlık dışındaki alt gruplarda anlamlı farklılık saptanmıştır ($P<0,001$). Depresyon, anksiyete ve Pittsburgh uyku kalitesi skorları iki grup arasında herhangi bir farklılık gösterilmemiştir ($P>0,05$).

Sonuç: KBA yaşam kalitesini negatif olarak etkilemektedir. KBA hastalara yaklaşımda gözönünde bulundurulması gereken bir durumdur.

Anahtar kelimeler: Kronik bel ağrısı, Uyku bozuklukları, Yaşam kalitesi

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Introduction

Chronic low back pain (CLBP) is an important and common public health condition that leads to impairment, depression, and labor loss. Management of CLBP is also complicated and difficult. In the adult population, low back pain prevalence has been reported as 28.8% [1]. Sleep disorders such as irregular sleep and insomnia are not uncommon symptoms in CLBP patients. Uchmanowicz et al. [2] reported a relationship between CLBP and sleep disorders, with insomnia seen in 83% and daytime sleepiness in 29% of individuals with CLBP. Additionally, sleep disorders may be accompanied by anxiety and depressive symptoms in individuals with CLBP. Increased pain scores and decreased health related QoL scores have been determined in these patients with depressive symptoms [3]. CLBP is thought to decrease QoL and increase disability. In a study of 200 subjects, Panahi et al. [4] determined CLBP in 60.3%, and 80% of those with CLBP experienced disability according to the Roland-Morris disability questionnaire. The results of that study revealed that CLBP affects the physical dimension of health related QoL, along with exerting psychosocial effects. In the study of Uçurum et al. [5], CLBP was reported to affect QoL negatively due to pain and functional outcome. As shown in that study, CLBP is a psychosocial health problem that diminishes QoL. Anxiety in CLBP patients exacerbates depressive symptoms and sleep disorders, which leads to a deterioration in health-related life quality, social life, and labor loss.

In the light of this information, we aimed to reveal relationship between CLBP and QoL, depressive and anxiety symptoms and sleep disturbances in Turkish population by taking a different approach to these patients.

Materials and methods

Subjects

This cross-sectional study included 73 healthy controls and 73 CLBP patients with complaints for at least 6 months, who were referred to Başkent University Physical Medicine and Rehabilitation Outpatients Clinic. Patients who met the criteria between January-June 2018 aged between 18-65 years were included in the study. No gender difference was taken into consideration. Exclusion criteria were determined as low back pain with inflammatory characteristics, a history of lumbar stabilization surgery, infection, pregnancy, or a diagnosis of depression, anxiety, or psychosis. Approval for the study was granted by the Ethics Committee of Başkent University School of Medicine with the project number of KA17/319 prior to commencement (Approved on 06.12.2017, decision number 17/99). All participants signed informed consents.

Evaluation

The demographic and clinical characteristics were obtained in a face-to-face interview and recorded. The history of the chronic low back pain including the time of onset, characteristics (mechanical or inflammatory), dissemination, and factors that increased the pain were examined. A detailed motor and sensory examination were performed to all the patients by the same physician. The spinal mobility examination was performed with finger-to-floor distance measurement and the modified Schober test. Following detailed examination, the same physician applied all the questionnaires to the participants.

Short form of McGill Pain Questionnaire: Pain was evaluated using the Short form of the McGill Pain Questionnaire. The first part includes 15 descriptors, 11 sensory and 4 affective. Second part consists of visual analog scale (VAS) and the last part contains evaluative words that subjectively report the severity of the pain they experienced [6].

Roland Morris Disability Index: This index evaluates disability due to low back pain. It consists of 24 items related to physical activity, rest/sleep, psychosocial outcomes, home management, feeding and pain frequency. Higher scores indicate increased disability [7].

Beck Depression Inventory: The Beck Depression Inventory (BDI) was utilized to assess depressive symptoms and anxiety. The BDI contains 21 items with higher scores indicating increased severity of depressive symptoms [8].

Beck Anxiety Inventory: The Beck Anxiety Inventory (BAI) is a subjective and self-reporting scale that is used to assess the anxiety. The BAI contains 21 items with higher scores indicating severe anxiety symptoms [9].

Pittsburgh Sleep Quality Index (PSQI): This index is used to assess sleep quality, sleep latency, and sleep duration. Symptoms experienced in the previous 4 weeks are questioned with higher scores indicating poor sleep quality [10].

Short Form-36 (SF-36): The Short form 36 (SF-36) is a scale that consists of questions containing items that measure the QoL. It contains 36 items in 2 parts; mental and physical. Points range from 0-100, with higher points indicating a better health related QoL [11].

Statistical analysis

IBM SPSS statistics v20 software program was used for statistical analyses. Power analysis was performed, and the sample size was determined as a minimum of 73 participants per group. Kolmogorov-Smirnov test was used to determine the normality of the distribution of the continuous variables. Normally distributed quantitative data were expressed as mean (standard deviation) (SD) and non-normally distributed quantitative data were shown as median (min-max) values. Categorical variables were stated as number and percentage. The Student's t-test was used to determine correlations between normally distributed data and the Mann Whitney U-test was applied to non-normally distributed data. Nominal variables were compared using the Chi-square and Fischer's Exact test. Pearson/Spearman correlation analyses were used on quantitative data. The level of statistical significance was set at $P<0.05$.

Results

No statistically significant difference was determined between the study and the control groups in terms of age, gender, or male/female ratio ($P>0.05$ for all) (Table 1).

The study and control groups showed a statistically difference with respect to the sub-scales of SF-36, including physical functioning, physical role, bodily pain, general health, social functioning and emotional role ($P<0.001$), However, no significant difference was determined regarding the sub-scales of vitality and mental health ($P=0.218$, $P=0.444$) (Table 2).

In the comparison of the BDI, BAI, and PSQI scores, there were no significant differences between the two groups (P>0.05).

With exception of the mental health sub-scale, a negative correlation was determined between the other sub-scales of SF-36 and the short form McGill pain scores. The mental health sub-scale scores did not show any correlation with the short form McGill pain scores (r=-0.195, P>0.05).

A negative correlation was determined between the Roland-Morris scores and the SF-36 total and sub-scale scores of physical functioning, role physical, emotional role, vitality, social functioning, bodily pain and general health (r=-0.646, P<0.001; r=-0.392, P<0.01; r=0-.310, P<0.01; r=-0.313, P<0.01; r=-0.474, P<0.001; r=-0.568, P<0.001; r=-0.233, P<0.05, respectively). No significant correlation was determined with respect to mental health scores (r=-0.292, P>0.05).

A positive correlation was determined between the PSQI scores and BDI, BAI, Short form McGill pain, and the Roland Morris scores (r=0.556, P<0.001; r=0.477, P<0.001; r=0387, P<0.01; r=0.300, P<0.05, respectively). The Short form McGill scores were correlated with the BDI, BAI and the Roland-Morris scores positively (r=0.392, P<0.01; r=0.336, P<0.01; r=0.369 P<0.01, respectively). The Roland-Morris scores showed a positive correlation with the BDI and BAI scores (r=0.322, P<0.01; r=0.195, P<0.01, respectively). Finally, a positive correlation was determined between the BDI and BAI scores (r=0.679, P<0.001).

Table 1: Demographic characteristics of the subjects

	Study group	Control group	*P*-value
Age, mean (SD)	43.00 (9.90)	43.22 (11.87)	0.904
Gender, n(%)			
Female	45 (61.6)	45 (61.6)	1.000
Male	28 (38.4)	28 (38.4)	

Table 2: Comparison of scores SF-36 subgroups in study and control groups

SF-36	Study group		Control group		Test	*P*-value
	Mean (SD)	Median (Min-max)	Mean (SD)	Median (Min-max)	Statistics	
Physical Functioning	55.00(21.24)	50 (5-100)	77.46(20.92)	80 (20-100)	U=1189.5	<0.001
Role physical	29.79(37.65)	0 (0-100)	67.82(35.47)	75 (0-100)	U=1323.0	<0.001
Role emotional	49.77(42.35)	33.3(0-100)	79.91(30.80)	100 (0-100)	U=1624.0	<0.001
Vitality	44.73(16.49)	45 (5-80)	47.81(21.92)	50 (0-100)	U=2351.0	0.218
Mental Health	64.66(14.77)	68 (28-92)	66.30(15.52)	72 (8-96)	U=2469.5	0.444
Social Functioning	54.11(26.36)	50 (0-100)	62.50(20.62)	62.5(0-100)	U=2084.5	0.021
Bodily pain	45.89(22.05)	45 (0-90)	57.10(24.26)	55 (0-100)	U=1963.5	0.006
General Health	52.88(18.56)	55 (10-85)	66.44(17.96)	70 (10-100)	U=1568.5	<0.001
Beck Depression Inventory	10.86(8.54)	10 (0-36)	10.94(8.75)	9 (0-34)	U=2653.0	0.964
Beck Anxiety Inventory	13.94(9.99)	11 (0-40)	11.05(9.39)	8 (0-32)	U=2190.5	0.063
Pittsburgh sleep Quality Index	6.52(3.49)	6 (0-16)	5.81(2.96)	5 (2-16)	U=2352.0	0.218

Discussion

CLBP is the most common musculoskeletal pain and a serious public health condition that can lead to workforce loss, disability, sleep disorders, depression, and anxiety [12]. Management of this condition may be more difficult than expected. The goal of the current study was to reveal the correlation between depression, pain, disability and QoL in patients suffering from CLBP.

No significant differences were detected between the mean age of the two groups (43.00 (9.90) years vs. 43.22 (11.87) years). It has been previously shown that low back pain is a musculoskeletal disorder, mostly affecting middle-aged individuals [2,6,14,15]. Currently, findings were coherent with the literature.

Chronic low back pain is a widespread, public (65%) problem which has a negative effect on both physical and mental functioning [12,13]. The SF-36 is utilized to reveal QoL in 8 sub-scales [11]. Similarly, Mutubuki et al. [12] reported poor QoL in patients with CLBP. Another study that used a different questionnaire, reported poor QoL among CLBP subjects [14]. According to the findings of current study, no significant correlation was detected in the comparison of the two groups in terms of the vitality and mental health sub-scales of the SF-36. The other sub-scale scores (social functioning, general health, and pain) were worse in the study group. These findings were similar to the findings obtained in the comparison of the depression scores of the two groups. Depression scores did not differ between two groups.

The effect of chronic pain on depression has always been remarkable [14]. It has been reported that CLBP patients suffer from depression and anxiety more than their healthy counterparts [13,15]. Namgwave et al. [16] detected depression at a rate of 39.5% in a cross-sectional study of 114 CLBP patients. Similarly, in a controlled study, Sribastav et al. [17] reported increased depressive symptoms in patients with CLBP. High depression scores were reported not only in CLBP patients but also in comparison with patients with and without subacute low back pain [18]. In contrast, the present study found no difference in respect of BDI scores.

One of the non-organic causes of chronic low back pain is psychosomatic spinal pain. Physiological muscle stiffness due to anxiety is thought to be one of the most significant reasons for this spinal pain [14]. Oliveira et al. [19] reported anxiety in 72% of patients with CLBP. Another study revealed similar anxiety scores in the same patient group [13]. In the current study, anxiety scores of the patients did not show any differences between the subjects (P>0.05). These findings may contradict many findings in previous studies in literature. Some studies have stated that comorbidities such as hypertension or previously received health care are other risk factors for depression in patients with CLBP [20]. Comorbidities and prior treatment/health care were not evaluated in the current study, so the difference in results could be related to this lack of data.

Many previous studies have evaluated the relationship between CLBP and sleep disorders [21]. CLBP seemed to have a negative effect on sleep quality [22]. Sleep disorders have been shown to accompany depression and anxiety [17]. However, although another study reported that depressive and anxiety symptoms were highly seen in patients with CLBP, we did not detect any significant differences between two groups with respect to sleep quality. However, in that study, patients highly had spinal stenosis and no pain in supine position [23]. Currently, there was not any correlation between the scores of depression and anxiety in the two groups, but the findings showed that sleep disorders were related to depression, anxiety, pain, and disability. Sleep disorders might be related to nocturnal pain, however, in the current study, patients were not questioned about whether they experienced nocturnal pain. Our study group was mostly composed of patients with no night pain. This contradiction might be related to the sample size.

Currently, both VAS and Short form McGill pain questionnaire is used to evaluate pain. A negative correlation was determined between the Short form McGill pain and SF-36 scores. Apart from the mental health scores, all the other SF-36

sub-scales were correlated with the Short form McGill pain questionnaire scores. A negative correlation was also determined between VAS and SF-36 scores.

With the exception of the mental health scores, a negative relationship was detected between the other QoL sub-scales and the Roland Morris disability index scores.

Previous studies investigating the correlation between pain and disability in patients with CLBP have revealed that pain affects disability scores [22]. A similar positive correlation was determined between disability and pain scores in the current study.

There were some limitations to this study, primarily that the patients included had symptoms ongoing for at least 6 months, but the exact duration was not known. Therefore, disease duration could not be linked with depression, anxiety, QoL or sleep disorders. In addition, any correlation of sleep disorder and pain could not be evaluated due to the lack of night pain data. Although the exclusion criteria consisted of diagnosed psychological disorders, undiagnosed disorders may have been missed. While clinical and demographic characteristics of the patients were recorded, previous treatment, medication or conventional physical therapy were not questioned. The records did not include any etiology inquiry so etiological factors could not be evaluated. Depression and anxiety were evaluated according to the patients' own reports.

Conclusion

CLBP negatively effects individuals' QoL. This finding might be important in the treatment and management of chronic low back pain.

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