

Araştırma Makalesi

Total Kalça ve Diz Artroplastili Hastalarda Kinezyofobinin Erken Dönem Fonksiyonel ve Psikolojik Sonuçlar ile İlişkisi

The Relationship Between Kinesiophobia and Early Functional and Physiological Outcomes in Patients with Total Hip and Knee Arthroplasty

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ÖZ

Amaç: Bu çalışmanın amacı, total kalça ve diz artroplastisi sonrası kinezyofobi seviyesi ile erken fonksiyonel sonuç ve psikolojik stres (anksiyete ve depresyon) arasındaki ilişkinin incelenmesidir. **Gereç ve Yöntem:** Bu kesitsel çalışmaya, total kalça (n=40) ve diz artroplastisi (n=46) olan toplam 86 hasta dahil edildi. Ağrı değerlendirilmesi için Görsel Ağrı Ölçütü (GAÖ); fonksiyonel değerlendirmeler için 2 dk yürüme testi (2-DYT) ve süreli kalk yürü testi (SKYT) kullanıldı. Cerrahiden sonra taburculuk gününde tüm hastalara Tampa Kinezyofobi Ölçeği (TKÖ) kullanıldı. Hastane Anksiyete ve Depresyon Skalası (HADS) psikolojik stresin (kaygı ve depresyon) değerlendirilmesinde kullanıldı. Klinik sonuçlarla kinezyofobi arasındaki ilişkiye regresyon analizi ile bakıldı. **Sonuçlar:** Total kalça ve diz artroplastili hastalar arasında kinezyofobi seviyeleri benzerdi. Ağrı seviyesi (r=0.69, p<0.001), SKYT (r=0.31, p=0.005), ve 2-DYT (r=0.72, p<0.001) kinezyofobi seviyeleri ile ilişkiliydi. Anksiyete seviyesi ve kinezyofobi arasında anlamlı bir ilişki varken (r=-0.58, p<0.001), depresyon seviyesi arasında anlamlı bir ilişki yoktu (p=0.454). **Tartışma:** Alt ekstremitte artroplastisi geçiren hastalarda erken fonksiyonel sonuçlar, ağrı seviyesi ve psikolojik stres cerrahi sonrası ortaya çıkan kinezyofobi ile ilişkilidir.

Anahtar Kelimeler: Artroplastisi; Kalça replasmanı; Diz replasmanı; Sonuç değerlendirilmesi (sağlık hizmeti)

ABSTRACT

Purpose: The aim of the study is to investigate the relationship between kinesiophobia levels and early functional outcomes and psychological distress (anxiety and depression) after total hip and knee arthroplasty. **Materials and Method:** In this cross-sectional study, 86 patients with total hip (n=40) and knee (n=46) arthroplasty were included in the study. Pain was measured with Visual Analog Scale (VAS), functional outcomes were measured with 2-minute walk test (2-MWT) and the timed up and go test (TUG). The Tampa Scale for Kinesiophobia (TSK) applied to all patients on the day of discharge after surgery. The Hospital Anxiety and Depression Scale (HAD) was used to assess the psychological distress (anxiety and depression). Regression analysis was used to determine the relationship between kinesiophobia and the clinical outcomes. **Results:** The kinesiophobia levels were similar between total hip and knee arthroplasty patients. Pain levels (r=0.69, p<0.001), TUG (r=0.31, p=0.005), and 2-MWT (r=0.72, p<0.001) were correlated with the kinesiophobia levels. While there was a significant correlation between anxiety level (r=-0.58, p<0.001) and kinesiophobia, there was no correlation between depression level (p=0.454). **Conclusion:** The presence of postoperative kinesiophobia is associated with early functional outcomes, pain levels and psychological distress in patients undergoing lower extremity arthroplasty.

Key Words: Arthroplasty; Hip replacement; Knee Replacement; Outcome Assessment (Health Care).

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Osteoarthritis (OA) of the hip or knee is a leading cause of pain and disability in the elderly population (Blagojevic, Jinks, Jeffery, & Jordan, 2010; Pereira et al., 2011) and for the late stage OA, total knee arthroplasty (TKA) and total hip arthroplasty (THA) are inevitable (Brady, Masri, Garbuz et al 2000; Räsänen, Paavolainen, Sintonen et al 2007). Although surgical techniques have been improved, a subgroup of patients have poorer postoperative outcomes with respect to pain and physical functioning (Anakwe, Jenkins, Moran, 2011; Scott, Bugler, Clement et al 2012).

High levels of kinesiophobia in TKA is predisposing the development of chronic pain and negatively influence functional outcome (Vlaeyen and Linton, 2000; Doury-Panchout, Metivier and Fouquet, 2015; Kocic, Stankovic, Lazovic et al, 2014; Monticone, Ferrante, Rocca et al 2013; Sullivan, Tanzer, Reardon et al 2011; Bjerke, Öhberg, Nilsson et al 2014). Although there is no evidence, kinesiophobia is thought to be a risk factor for patients with THA (Holm, Kristensen, Husted et al 2011). Therefore, determining the pain-related fear of movement is important for the patients with THA and TKA in order to identify the risk factors (Doury-Panchout, Metivier, & Fouquet, 2015; Duivenvoorden et al., 2013; Holm, Kristensen, Husted, Kehlet, & Bandholm, 2011; Kocic et al., 2014; Monticone et al., 2013; Sullivan et al., 2011). Symptoms such as kinesiophobia, anxiety and depression appear before surgery, increase at the early stage after surgery and remain till later stages after surgery (till 12 months) in patients with THA and TKA (Doury-Panchout et al., 2015; Duivenvoorden et al., 2013; Monticone et al., 2013; Sullivan et al., 2011). Since these symptoms are related with the poor functional outcomes after surgery (Monticone et al., 2013; Sullivan et al., 2011), the determination of the severity of these symptoms at the early stage after surgery (in postoperative 1 week) is very important.

In this study, we attempt to determine how strongly kinesiophobia relates to early functional outcomes, anxiety and depression in patients with THA and TKA. To the best of our knowledge, no previous investigation has comprehensively evaluated these study factors in combination. Accordingly, it is hypothesized that (1) fear of movement would differ between THA and TKA patients (2)

kinesiophobia following knee and hip arthroplasty would relate to early stage functional outcomes, anxiety and depression.

MATERIAL AND METHODS

Forty-six patients with the diagnosis of primary knee OA and forty patients with primary hip OA who were scheduled between August 2014 and June 2015 for unilateral total knee or hip arthroplasty were included in the study. Exclusion criteria were having a previous knee or hip surgery or fracture, diagnosis of rheumatoid arthritis, severe obesity (BMI > 40 kg/m²), and sensory or motor disorders in the operated limb, inability to understand pain assessment. The same surgery approach was applied by the same orthopaedic surgeon under general anesthesia to all patients.

Fear of movement determination

A 17-item Turkish version of the self-reported Tampa Scale for Kinesiophobia questionnaire was used to determine the fear of movement level (Yilmaz, Yakut, Uygur, & Ulug, 2011) to all patients on the discharge day. Each item was scored using a 4-point Likert scale ranging from 1 to 4 (1=strongly disagree and 4=strongly agree). The total score was calculated by adding the scores of the individual items (range, 17-68) with higher scores, indicating a greater degree of kinesiophobia (Vissers et al., 2012; Vlaeyen, Kole-Snijders, Boeren, & Van Eek, 1995).

Assessment of functional levels

Functional walking capacity was measured by the 2-minute walk test (2-MWT) on the discharge day after surgery. The patients were asked to walk during 2 minute time period and the distance was recorded in meters (Carli et al., 2010; Connelly, Thomas, Cliffe, Perry, & Smith, 2009).

The timed up and go test (TUG) was used to measure the mobility, which requires static and dynamic balance. The patients were asked to stand from a chair, walk three meters with their assistive device, turn around and walk back to the chair as quick as possible (Podsiadlo & Richardson, 1991). Patients performed two trials and the average time to complete the test was recorded on the discharge day after surgery.

Pain assessment

A 10-point Visual Analog Scale (VAS) ranging from 0 (no pain at all) to 10 (the worst imaginable pain) was used to assess the pain levels on the discharge day (Huskisson, 1974).

Assessment of anxiety and depression

The Hospital Anxiety and Depression Scale (HADS) was used to screen anxiety and depressive symptoms. The HADS consists of 14 items, each rated from 0 to 3 (0= no distress and 3= maximum distress) according to the severity of distress level (range from 0 to 21) (Bielland, Dahl, Hang, & Nec-kelmann, 2002).

The study was approved by the University Ethics Committee (GO 15/04-26) and this study meets the guidelines of the Declaration of Helsinki and after the ethical approval all subjects provided written informed consent.

Statistical Analyses

Statistical analyses were carried out with IBM SPSS for Windows version 21.0 statistical software (IBM SPSS Inc., Chicago, IL, USA). For numeric variables, differences between groups were determined by independent samples t test. Effect of the kinesiophobia on outcomes (pain severity, timed up & go, 2MWT, HADS-Anxiety and HADS-Depression) after total hip and knee arthroplasty was determined by multiple linear regression analysis. Gender, age, BMI and type of surgery were used as covariates. Significance value was considered as 0.05.

RESULTS

There were no gender, age and BMI differences between TKA and THA groups ($p < 0.05$) (Table 1). Kinesiophobia score was similar in THA and TKA groups ($p = 0.464$). Pain severity ($p = 0.312$), TUG ($p = 0.998$), 2-MWT ($p = 0.074$), HADS-Anxiety ($p = 0.098$) and HADS-Depression ($p = 0.133$) scores did not differ between THA and TKA groups (Table 1).

Multiple linear regression analysis revealed that kinesiophobia level was significantly related with pain severity ($r = 0.69$, $p < 0.001$), TUG results ($r = 0.31$, $p = 0.004$), 2-MWT ($r = -0.72$, $p < 0.001$) and HADS-Anxiety level ($r = -0.58$, $p < 0.001$) (Table 2). The relation between kinesiophobia and HADS-

Depression level was not statistically significant ($p > 0.05$). These relationships were independent of age, BMI, gender and type of surgery (Table 2).

DISCUSSION

The most important finding of this study was there was not a significant difference in kinesiophobia level between THA and TKA patients, at early stage following surgery. In literature, there are only a few studies evaluating the kinesiophobia in TKA patients (Doury-Panchout et al., 2015; Kocic et al., 2014; Monticone et al., 2013; Sullivan et al., 2011). Sullivan et al (Sullivan et al., 2011) suggested that fear of movement plays an important role as a determinant of problematic outcomes following TKA. Doury-Panchout et al (Doury-Panchout et al., 2015) revealed that kinesiophobia negatively influences recovery of joint function following TKA. In addition, Monticone et al (Monticone et al., 2013) indicated that treatment of kinesiophobia was useful in changing the pain, and the quality of life in patients with TKA. Although there is no study on how kinesiophobia relates with functional outcomes following THA, Holm et al (Holm et al., 2011), pointed that fear of movement may influence the functional outcomes in THA patients, when the researchers could not show any relationship between muscle strength loss and changes in functional outcome in their study. The results of the previous studies suggest that, kinesiophobia should be taken into account for both TKA and THA patients in order to identify the negative influence of postoperative outcomes. Our results showed that patients with THA and TKA had notable kinesiophobia levels, but this level was similar between the THA and TKA patients.

Another important study finding was that kinesiophobia predicted the early functional outcome levels. The previous investigations indicated that the high level of kinesiophobia seriously affects functional outcomes and the return to previous activity levels in TKA and ACL-reconstructed patients (Cozzi, Dunn, Harding, Valovich, & Welch, 2014; Kvist, Ek, Sporrstedt, & Good, 2005; Sullivan et al., 2011). Sullivan et al (Sullivan et al., 2011) found that pain-related fear of movement predicts the post-surgical functional difficulties following TKA. Doury-Panchout et al (Doury-Panchout et al., 2015) found that kinesiophobia is a good pre-

dicator of performance in the six-minute walk test for TKA patients and showed that patients with high kinesiophobia walked shorter distances than patients without kinesiophobia. These authors indicated the fear-avoidance model may be the main cause of the functional impairment in patients with kinesiophobia (Doury-Panchout et al., 2015; Sullivan et al., 2011). According to this model fear may lead to the avoidance of functional behaviors such as walking which results with disability (Leeuw et al., 2007; Vlaeyen & Linton, 2000). The relationship between the kinesiophobia and 2-MWT results of the present study are in agreement with the previous studies that the higher the degree of kinesiophobia was, the shorter the distance of a patient was able to walk. The present study indicated that high kinesiophobia levels have an adverse effect on TUG results. Moreover, regression analysis revealed that 61% and 9% of 2-MWT and TUG score changes could be explained by kinesiophobia levels (independent of age, BMI, gender and type of surgery). Our results support the fear-avoidance model and suggest that pain-related fear of movement impairs walking capacity in patients with THA and TKA on the discharge day.

In the present study, a significant relationship between kinesiophobia and anxiety level was identified in patients while the depression level was not related with kinesiophobia. Duivenvoorden et al (Duivenvoorden et al., 2013) showed that when the pain and disability decreases after THA and TKA, the prevalence of psychological symptoms also decreases. Our findings indicated that assessment of kinesiophobia and psychological symptoms are important and the identification of individuals at risk may be essential for optimizing the functional results after THA and TKA.

This study is limited since the pre-surgery scores of kinesiophobia and HADS scores could not be recorded. Therefore the psychological impact of surgery were not assessed and interpreted. The study would be interesting, if a correlation could be shown with any pre-operative score of kinesiophobia and postoperative clinical result.

In conclusion, fear of movement can adversely affect the early functional outcomes in TKA and THA patients. It is important to improve the functional outcomes as soon as possible after hip

and knee arthroplasty surgery. Therefore, identifying the level of kinesiophobia after THA and TKA at the early stage is essential. The clinicians need to consider the inter-relationships between fear of movement and functional outcomes when designing, implementing, and monitoring daily therapeutic exercise programs. It is important to explain how to modify the patients' fears and encouraging them to adopt the positive attitude toward the exercise and increase their physical performance.

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