



Multidisciplinary Treatment in Patients With Persistent Pain Following Total Hip and Knee Arthroplasty

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ABSTRACT

In a retrospective study, we evaluated the clinical outcome of multidisciplinary pain therapy (MPT) in a consecutive series of 40 patients with persistent unexplained pain following THA or TKA. Pain intensity, physical capability and psychological status were assessed before MPT (t1), after 3 weeks (t2) and at a mean follow-up of 32 months (t3). At t2, all scores demonstrated a significant improvement compared to the baseline value. At t3, pain intensity, physical capability, and depression levels deteriorated slightly but were still significantly better compared to baseline values. Anxiety scores deteriorated between t2 and t3 and showed no difference in the baseline value. The present study suggests that MPT has beneficial short-term and mid-term effects in this subgroup of patients and may avoid exploratory revision surgery.

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Despite the great success of total hip (THA) and knee (TKA) arthroplasty there is a subgroup of patients who remain dissatisfied with these procedures and develop persistent pain with functional limitations [1,2]. Persistent pain of unclear etiology after an elective joint arthroplasty procedure that was intended to reduce or even cure the pain is a major cause for dissatisfaction of patients and may jeopardize the doctor–patient relationship. It is a condition that is difficult to deal with, and consequently poses a great therapeutic challenge for both orthopedic surgeons and other health care professionals.

Several studies have highlighted the importance of psychological [1,3] and socioeconomic factors [4] for predicting the outcome of THA and TKA. Moreover, it has been reported that exploratory revision surgery for persistent pain following joint arthroplasty has poor results and may even worsen the situation [5,6]. There is some agreement that patients with unexplained pain following hip or knee arthroplasty may benefit from conservative multidisciplinary treatment options [7]. However, data on potential treatment strategies, clinical outcomes and sustainability of potential therapies are very limited.

Multidisciplinary pain therapy (MPT) describes an integrated biopsychosocial treatment concept in which somatic and psychotherapeutic procedures cooperate with physical and psychological training programs [8]. MPT has been reported as successful in the

treatment of patients with chronic musculoskeletal pain such as neck pain [9,10], low-back pain [9–11] or fibromyalgia syndrome [12].

The objective of the present study was to evaluate whether and to what extent patients with persistent pain after THA and TKA benefit from multidisciplinary pain therapy in the short-term and mid-term.

Patients and Methods

Study Cohort

In a retrospective cohort study, we reviewed a consecutive series of 40 patients suffering from persistent pain after THA and TKA who had undergone multidisciplinary pain therapy at our institution between April 2007 and April 2010. The primary inclusion criterion was persistent pain following THA or TKA as the predominant symptom, defined as disabling pain of the replaced joint with functional limitations of at least 6 months in duration. Prior to inclusion, patients underwent a standardized diagnostic work-up including a thorough clinical examination with radiographs of the affected joint in two planes to rule out instability, component malpositioning, aseptic loosening, excessive wear, or other implant-related causes of pain necessitating surgical treatment. The clinical examination and the radiographic assessment were performed by at least two independent orthopedic surgeons specialized in arthroplasty of the hip and knee. Additional computed tomography (CT) or magnetic resonance imaging (MRI) was performed in some cases if plain radiographs were not considered as sufficient. To rule out active infection, laboratory values and a joint aspiration with bacterial culture were obtained from all patients. Patients with elevated

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Table 1
Modalities of MPT.

Modality	Group	Individual	Total	Details
Medical treatment	5	2	7	Physical examination Diagnostic procedures Medication Medical education
Physical therapy	11	1–3	12–14	Endurance training Strength training Sensomotoric training Relaxation
Psychological therapy	3	3	6	Pain coping Cognitive–behavioral therapy Relaxation techniques Biofeedback
Occupational therapy	–	0–2	0–2	Work hardening
Music therapy	2	–	2	Receptive music therapy
Dance therapy	1	–	1	Movement experience
Total	22	8	30	

Numbers indicate the average time in hours per week spent with each modality in group and individual therapy sessions.

inflammatory parameters (C-reactive protein [CRP]; leukocyte count [WBC]; and erythrocyte sedimentation rate [ESR]) and/or a positive bacterial culture were excluded from the present study. Further exclusion criteria were as follows: tumor disease (diagnosis from history and by radiographic/MRI examination); acute trauma or fracture (history and radiographic examination); systemic inflammatory or rheumatic disease (blood count and radiographic evaluation/MRI); structural pathology of the spine, that is, nucleus pulposus prolapse with corresponding radicular pain, spinal stenosis or spondylolisthesis (radiographic evaluation/MRI and clinical examination); serious cardiopulmonary, vascular or other internal medical conditions; any neurological deficits in the lower extremities (clinical examination); and severe psychiatric disorders (medical history, psychological assessment) with inadequate patient compliance, limited physical ability or impaired cognitive capability that would not allow the patient to fully understand the program content or participate in the physical aspects of the program. All participants gave informed consent prior to inclusion. The study was approved by the institutional ethics committee.

Multidisciplinary Pain Therapy (MPT)

MPT describes an integrated bio-psycho-social treatment concept in which medical and psychosocial procedures cooperate with physical and psychological training programs (Table 1). Details of the present MPT protocol have been previously reported [8,11]. In brief, the goal of the present MPT protocol was to restore both the physical and psychosocial abilities of the patients. MPT consists of physical exercises, ergonomic training and occupational therapy to enhance physical activity levels with improvement of joint function and muscular stabilization. On the psychosocial level, MPT comprises patient education, and cognitive–behavioral and psychodynamic therapy to expand knowledge on subjective theories on pain, reduce fear–avoidance behavior, and develop individual coping strategies and enhanced understanding for the role the pain plays in their personal circumstances. Moreover, it aims for a stepwise reduction of or withdrawal from opioid medication.

MPT was performed in a specialized musculoskeletal pain outpatient unit; it comprised 6-h sessions on 5 days per week for 3 weeks, giving a total of 90 therapy hours on average.

Clinical Outcome

Before multidisciplinary treatment (t1), after 3 weeks of therapy (t2) and at a minimum of 12-month follow-up (t3) patients were

asked to complete an identical standardized questionnaire. Pain intensity was assessed on a Numeric Rating Scale (NRS) from 0 (“no pain”) to 10 (“worst possible pain”) [13]. General physical capability was evaluated using the Hannover Functional Ability Questionnaire (FFbH-R) [14,15] which is an established tool that determines the pain-related functional ability in activities of daily living in adults with chronic pain. It consists of 12 items with a three-stage answering scale and provides a summary score on a scale from 0% (minimum functional ability) to 100% (maximum functional ability). To assess the psychological status of patients before and after MPT, levels of anxiety and depression were determined by the Hospital Anxiety (HADS-A) and Depression Scale (HADS-D) [16,17]. The score consists of seven items for anxiety and seven items for depression. Each item on the questionnaire is scored on an ordinal four-stage answering scale (0–3) resulting in summary scores from 0 (minimum) to 21 (maximum) for either anxiety or depression. In a systematic review, Bjelland et al [18] determined the cut-off score to be 8/21 for anxiety and 8/21 for depression, respectively. In addition, intake of opioid medication or nonsteroidal anti-inflammatory drugs (NSAIDs), regular physical activity or psychotherapy (yes/no) were evaluated at all time points.

Data for t1 and t2 were retrieved from a prospective hospital database. At t3, patients were contacted by mail or phone to complete the identical questionnaire for the final follow-up.

Statistics

The distribution of variables was examined in exploratory data analysis and tested for normality using the Shapiro–Wilk test. As not all variables met the criteria for a normal distribution, absolute median values and ranges are provided for descriptive analysis. To evaluate differences in questionnaire scores at t2 and t3 compared to the baseline value at t1, the Friedman test was conducted as a global test to identify significant differences for repeated measures. Post hoc analysis was performed using Wilcoxon signed rank tests with a Bonferroni correction applied, resulting in a significance level set at $P < 0.006$. A McNemar test was used to compare frequencies of opioid and NSAID intake before therapy (t1) and at final-follow-up (t3). Non-parametric correlation (Spearman's rank order) was performed to evaluate associations between continuous variables in order to identify predictive factors on pain reduction during therapy between t1 and t3 (dNRS t1–t3). Correlation was characterized as poor (0.00–0.20), fair (0.21–0.40), moderate (0.41–0.60) good (0.61–0.80), or excellent (0.81–1.00). All statistical analyses were carried out using SPSS Statistics 17.0 (SPSS, Chicago, IL, USA).

Results

Forty (40) patients (12 males, 28 females, mean age 62 years, Table 2) met the inclusion criteria and were included in the study. All patients reported failed previous outpatient and/or inpatient therapies for persistent pain following THA or TKA. Complete data were available for all patients at t1 and t2 from a prospective hospital database. No patient dropouts or early discontinuing of therapy were observed. Fifteen patients had a THA (12 unilateral, 3 bilateral), 19 patients had a TKA (17 unilateral, 2 bilateral), and 6 patients had both

Table 2
Patient Demographics.

Demographics	n
Age (y)	60 (37–79)
BMI (kg/m ²)	27 (20–32)
Female	28 (70%)
Male	12 (30%)

Age and BMI are given as mean values with range.

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