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Experience, Thoughts, and Attitudes of Orthopaedic Surgeons about Chronic Postsurgical Pain after Arthroplasty

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ABSTRACT

Objective: Arthroplasty constitutes a major procedure commonly used in orthopaedic and traumatology surgery, and chronic pain develops in 7%–34% of patients after arthroplasty. This study aims to evaluate the experience, thoughts and attitudes of orthopaedic surgeons about chronic postsurgical pain after arthroplasty.

Methods: The survey was sent to orthopaedic surgeons via the Google survey system. The questionnaire consisted of 17 questions in total; four were related to demographic information, two asked about the surgeons' experience, three asked for their thoughts, and eight queried their attitudes.

Results: The study evaluated 319 participants. All the orthopaedic surgeons reported that they routinely prescribe for postoperative pain control when discharging patients after arthroplasty. Of those surveyed, 69.7% have used multimodal analgesic therapy to treat chronic postsurgical pain after arthroplasty. Consultation rates were 5% and 20% for psychiatry and pain physician, respectively. A weak positive correlation was found between the rate of referring patients with chronic postsurgical pain after arthroplasty to pain physician and the beliefs of orthopaedic surgeons that pain physician can help patients with chronic postsurgical pain after arthroplasty who are unresponsive to pharmacological treatments ($p = 0.008$, $r = 0.148$).

Conclusion: Orthopaedic surgeons employ pre-emptive approaches to chronic postsurgical pain after arthroplasty and engage in pharmacological management of chronic postsurgical pain after arthroplasty, but they need to advance further with multidisciplinary treatments and directions.

Keywords: Chronic postsurgical pain, arthroplasty, orthopaedic surgeon, multidisciplinary pain management, multimodal pain treatment

1. INTRODUCTION

Utilisation rates of arthroplasty surgeries have increased exponentially, in population-based studies it has been reported as 8,200 per 100,000 (1-3). The survival of the joint replacement has been considered as an indicator of the success of arthroplasty, for many years (4). Recently, pain reduction has been to be considered as a parameter in evaluating the success of the operation, and, as a result of this new parameter, success rates have decreased (4, 5).

Chronic postsurgical pain is defined as 'the pain is localised to the surgical or referred area, persisting at least three months after surgery'. Chronic postsurgical pain is characterised as not being present before surgery or that has different characteristics or increased intensity from preoperative pain (6). Chronic postsurgical pain after arthroplasty (CPSP after arthroplasty) is seen in 7% to 23% of patients after hip arthroplasty, 10% to 34% after knee arthroplasty (7) and 16% to 29% after shoulder arthroplasty (8). CPSP after arthroplasty negatively affects a person's general activity level, working status, mood, relationships, sleeping and enjoyment of life (9).

Predictive factors in the development of chronic postsurgical pain and approaches that reduce the risk of development have been identified. Thanks to surgeons' awareness of chronic postsurgical pain, it is now possible to minimize the risk of developing this pain and combat it in case the pain develops (10). The general notion of chronic pain suggests that surgeons should focus on the patients' pain in their clinical practices, trainings, and researches, undertake the pharmacological management of pain regarding dose, side effects, and complications, receive support from pain clinics that offer pharmacological and interventional options in the management of patients, and emphasize multidisciplinary

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pain management (11). On the other hand, it has been reported that CPSP after arthroplasty has been neglected in the medical literature and needs more attention (12). The need to improve awareness of CPSP after arthroplasty is evident (13).

Although it is known that CPSP after arthroplasty affects people's lives negatively and that preventive and therapeutic approaches for this type of pain have been established in general terms, to the best of our knowledge, there is no study in the literature that reveals the clinical approaches of orthopedic surgeons regarding this subject. This study aimed to evaluate the experience, thoughts and attitudes of orthopaedic surgeons about CPSP after arthroplasty.

2. METHODS

2.1. Ethical Considerations

This cross-sectional study was conducted in accordance with the Declaration of Helsinki and in line with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement. The ethical approval was obtained from Ethics Committee of University of Health Sciences Turkey, Van Research and Training Hospital (No: 2020/24 Date: December.11.2020).

2.2. Data Collection

The study was conducted between December 2020 and April 2021. The survey was sent to orthopaedic surgeons via the Google survey system, and was sent to the Turkey Orthopaedics and Traumatology Association (TOTBİD) by e-mail. The study universe was composed of all orthopaedic surgeons actively working in Turkey, and it was aimed to reach the entire universe.

Orthopaedic surgeons with at least two years of experience who agreed to participate in the questionnaire and who completed the questionnaire in full were accepted as the sample. Those who did not answer the questionnaire, did not agree to participate in the study or answered the survey incompletely were excluded from the study.

One orthopaedic surgeon and one pain physician designed a survey to evaluate CPSP after arthroplasty, focusing on orthopaedic surgeons' thoughts, attitudes, and experiences. The physician based the questions to address important topics related to CPSP after arthroplasty. The survey included four questions to assess demographic characteristics (years of experience in orthopaedic surgery, type of health facility where they're employed, availability of a pain clinic in the hospital and city where they work) of the respondents; three questions related to thoughts of neuropathic pain component in CPSP after arthroplasty, the necessity of pharmacological treatment of CPSP after arthroplasty, and pain clinics effectivity on management of CPSP after arthroplasty; eight questions about attitudes towards management of early postoperative pain and assessment and management of CPSP after arthroplasty with their prescription preferences; two questions related to the frequency of use of loco-regional anesthesia in arthroplasty surgery working collaboration with a pain clinic and (Appendix).

2.3. Statistical Analysis

The SPSS 20.0 (IBM Corporation, Armonk, New York, United States) program was used to analyse the variables obtained in the study. The data collected contained continuous, categorical and ordinal variables. Continuous data were examined for normality of distribution using the Kolmogorov-Smirnov test. Data with non-normal distributions were summarised as medians with 25-75% percentiles. Categorical data were summarised in numbers and percentages. The relationship between nominal variables and continuous variables was evaluated with Point-Biserial analysis. The relationship between sequential categorical variables and continuous variables was assessed using Spearman's Rank Order Correlation analysis. The relationship between categorical variables was analysed using chi-square or Fisher exact tests.

3. RESULTS

A total of 334 physicians agreed to participate in the study; those with less than two years of experience in orthopaedic surgery were excluded (n = 15). The study was evaluated out of 319 participants.

The physicians' average experience in orthopaedic surgery was 10.0 (2.0–43.0) years, and the health centres where they work are shown in Table 1. In total, 35.4% (n = 113) of the orthopaedic surgeons worked in a clinic collaboration with the pain clinic in their residency, 51.7% (n = 165) had a pain physician in the health centre where they currently work and 79.0% (n = 252) had a pain physician in the city where they work.

Table 1. *Health centres where orthopaedic surgeons work*

Health Centre Type	Percentages (Frequencies)
Public hospital	29.4% (81)
Private center	17.2% (55)
Training and research hospital	32.6% (104)
University hospital	24.8% (79)
Total	100.0% (319)

The orthopaedic surgeons reported that loco-regional anaesthesia was administered at rates of 80.0 % (50.0–95.0) in the arthroplasty surgeries. Orthopaedic surgeons stated that they prescribe for postoperative pain control when discharging patients after arthroplasty at rates of 100.0 % (100.0–100.0). Their choices for painkillers for early postoperative pain are shown in Table 2.

Table 2. *Pain killer agents preferred by orthopedic surgeons for early postoperative pain*

Pain killers	Percentages (Frequencies)
Paracetamol and/or non-steroidal antiinflamatory drugs (1)	84.6% (270)
(1), and antidepressant combinations	2.2% (7)
(1), and gabapentinoids combinations	11.6% (37)
(1), and combinations of gabapentinoids and antidepressants	1.6% (5)
Total	100.0 (319)

The surgeons' thoughts were asked about neuropathic pain as a component of CPSP after arthroplasty, and interventional treatments of pain clinics for intractable CPSP after arthroplasty. The survey also queried their attitudes about concentration on pain, after excluding possible septic causes, as well as wound problems in patients who presented with chronic pain at the third and 12th months after arthroplasty. The answers, which were given on a Likert scale, are shown in Table 3. Orthopaedic surgeons declared that they use a 0.0% (0.0–20.0) validated scale or questionnaire to assess chronic pain after arthroplasty. Prescription preferences of orthopaedic surgeons for CPSP after arthroplasty are shown in Table 4. Consultation rates of orthopaedic surgeons for CPSP after arthroplasty to pain physician and psychiatry clinics are shown in Table 5.

There was a difference in orthopaedic surgeons' agreement to consider on the chronic pain after excluding possible underlying septic causes and wound problems between the patient groups at the third and 12th months ($p = 0.022$, $Z = 2.289$).

There was a statistically relation between orthopaedic surgeons' had been in coordination with the pain clinic during their residency and their referral of patients with CPSP after arthroplasty to a pain physician today ($p < 0.001$ $r = 0.209$). There was a statistically significant weak positive correlation between the rate of referring a patient with CPSP after arthroplasty to a pain physician and the presence of a pain physician in the health centre and/or city where she/he is currently working ($p = 0.01$ $r = 0.185$).

There was a weak positive correlation between the rate of referral of patients with CPSP after arthroplasty to pain physician and the belief of orthopaedic surgeons that pain physician can help patients with CPSP after arthroplasty who are unresponsive to pharmacological treatments ($p = 0.008$, $r = 0.148$).

Table 3. *Orthopaedic surgeons' thoughts and attitudes about CPSP after arthroplasty*

Likert	Percentages (Frequencies)				
	3. month*	12. month†	Neuropathic‡ pain	Prescription for CPSP§	Pain Physician||
1 Strongly disagree	8.5% (27)	10.1% (32)	4.1% (13)	11.9% (38)	4.4% (14)
2 Do not agree	18.2% (58)	11.6% (37)	9.7% (31)	18.2% (58)	6.6% (21)
3 Unsure	21.9% (70)	24.1% (77)	26.0% (83)	32.6% (104)	11.3% (36)
4 Agree	24.5% (78)	21.6% (69)	29.5% (94)	19.4% (62)	22.6% (72)
5 Strongly agree	27.0% (86)	32.6% (104)	30.7% (98)	17.9% (57)	55.2% (84)
Total	100.0% (319)	100.0% (319)	100.0% (319)	100.0% (319)	100.0% (319)

**: What is your approach, after excluding possible septic causes and wound problems, for the patient who comes with chronic pain in the third month after total/partial arthroplasty surgery? Do you agree with the proposition 'I'll consider on the pain'?*

†: What is your approach, after excluding possible septic causes and wound problems, for the patient who comes with chronic pain in the 12th month after arthroplasty? Do you agree with the proposition 'I'll consider on the pain'?

‡Do you agree with the proposition that patients who describe chronic pain after arthroplasty have neuropathic pain?

§: 'I think that patients who describe chronic pain after arthroplasty should receive routine pharmacological treatment for pain.' Do you agree with this proposition?

||: 'Despite the appropriate adequate pharmacological treatment I have given, there may be interventional pain procedures that the pain physician can employ.' Do you agree with this proposition?

Table 4. *Orthopaedic surgeons' preferred painkillers for CPSP after arthroplasty*

Pain killers	Percentages (frequencies)
Paracetamol and/or Nonsteroid Anti-Inflammatory Drugs (1)	23.2% (74)
Antidepressants	2.2% (7)
Gabapentionoids	5.0% (16)
(1) with Antidepressants	10.7% (34)
(1) with Gabapentinoids	40.4% (129)
(1) with Antidepressants and Gabapentinoids	8.8% (28)
Antidepressants with Gabapentinoids	1.3% (4)
Combinations with Opioids	8.5% (27)
Total	100,0% (319)

Table 5. *Number of orthopaedic surgeons to consult with patients experiencing chronic pain after arthroplasty*

Clinics	Median	25-75% percentiles
Pain Clinic	20.0	5.0-55.0
Psychiatry	5.0	0.0-10.0

4. DISCUSSION

In the present study, nearly all of the orthopaedic surgeons declared to prescribe medications for early postoperative pain control. More than half of the orthopaedic surgeons proclaimed that chronic pain should be focused on after excluding surgical complications, neuropathic pain might be a component of CPSP after arthroplasty, and preferred multimodal therapies for CPSP after arthroplasty management while they declared using validated scales to pain assessment seldomly and referred patients with CPSP after arthroplasty to pain and psychiatry clinics rarely. Moreover, the rate of referral of patients to pain clinics by orthopaedic surgeons was associated with the fact that surgeons worked with pain specialists during their residency, the presence of a pain specialist in the center where they are working, and the thought that pain specialists could be helpful.

The present study determined that nearly all of the orthopaedic surgeons prescribed medications for early postoperative pain control. The surgeons mainly used paracetamol and/or non-steroidal anti-inflammatory drugs, although 15% preferred gabapentinoids and antidepressant drug combinations; none of the physicians stated that they chose opioids. In the literature, Thomazeau et al. (14) showed that the severity of acute postoperative pain after knee arthroplasty is associated with CPSP after arthroplasty at the sixth month. Clarke et al. (15) concluded that the conversion of acute postoperative pain to chronic postsurgical pain could be prevented by using gabapentinoids, based on their systematic research and meta-analysis. Kinney et al. (16) found a relationship between increased postoperative opioid consumption and the development of chronic postsurgical pain. In this study, orthopaedic surgeons have been shown to prescribe appropriate pharmacological choices predictive of CPSP after arthroplasty development to manage early postoperative pain.

In the present study, the orthopaedic surgeons declared using validated scales rarely. In pain management, pain intensity and pain impact on functionality and quality of life are significant issues, and inappropriate pain assessment is one of the physician-related causes for chronic postsurgical pain development (17). Tools available to assess CPSP after arthroplasty include: Western Ontario and McMaster Universities' Osteoarthritis Index pain scale, which is a disease-specific questionnaire assessing pain severity, functionality and stiffness; Oxford Knee Score, a joint and disease-specific questionnaire that has a predictive value for outcomes of knee replacement; Brief Pain Inventory Short-Form, a generic questionnaire with pain severity and pain-related impacts; Short-Form McGill Pain Scale, a generic questionnaire assessing pain severity and affects; and the PainDETECT and Douleur Neuropathique-4, tools that evaluate the presence of neuropathic pain (18). In the present study, it can be concluded that orthopaedic surgeons did not sufficiently benefit from the available validated scales that may be useful for assessing the severity and impact of CPSP after arthroplasty.

In this study, the orthopaedic surgeons reported that loco-regional anaesthesia was used in joint arthroplasty at a frequency of 80%. Regional anaesthesia reduces the mortality and morbidity rates of arthroplasty (19). Oldman et al. (20) reported that regional anaesthesia practices in orthopaedic cases are associated with supportive attitudes of orthopaedic surgeons, and a Cochrane review declared that regional anaesthesia prevents chronic postsurgical pain (21). Epidural or spinal anaesthesia, plexus blocks and peripheral nerve blocks/infusions are regional anaesthesia options used in arthroplasty surgeries (22-24). In the present study, the high rate of regional anaesthesia in arthroplasty surgeries is a promising finding.

In this study, more than half of the orthopaedic surgeons declared that chronic pain should be focused on, after excluding surgical complications, when questioned about the postoperative period of 3 to 12 months. Wylde et al. (25) formed a core set for CPSP after arthroplasty, which proposes detailed questioning to evaluate pain intensity, temporal aspects of pain, the definition of pain, pain impacts on daily life/physical function/emotional life, use of pain medication, improvement in pain relief and satisfaction. Such sets in routine clinical follow-up can help chronic pain be defined beyond the subjective perceptions of orthopaedic surgeons and can increase their awareness.

In this study, 60.2% of orthopaedic surgeons thought that neuropathic pain might be a component of CPSP after arthroplasty and that 67.3% of orthopaedic surgeons prefer gabapentinoids and antidepressant agents as monotherapy or combinations in the treatment of CPSP after arthroplasty. Neuropathic pain is observed in 7% to 34% of patients with CPSP after arthroplasty (7, 9), and gabapentinoids and antidepressants are recommended in the treatment of chronic neuropathic pain (26, 27). Based on the findings of this study and the literature, it can be said that some patients with neuropathic pain were under-evaluated. Still, orthopaedic surgeons are successful in prescribing choices that are useful for possible neuropathic pain presence.

In the present study, 69.7% of the orthopaedic surgeons preferred multimodal therapies for CPSP after arthroplasty. Treatment with acetaminophen, NSAIDs, alpha-2-delta modulators (gabapentin, pregabalin), NMDA-receptor antagonists (ketamine), alpha-2 adrenergic agonists (clonidine, dexmedetomidine) and opioids are recommended for chronic postsurgical pain management (28). The preference rate of orthopedic surgeons for multimodal analgesics in the management of arthroplasty-related CPSP after arthroplasty was one of the encouraging findings of this study.

In the present study, the orthopaedic surgeons requested a pain clinic consultation at a frequency of 20% in patients with CPSP after arthroplasty in cases of refractory to pharmacological treatments. There are many interventional therapy choices for CPSP after total knee replacement, although they lack evidence (29). Erdem et al. (30) used ultrasound-guided genicular nerve pulsed radiofrequency in patients with CPSP after total knee replacement and found that after three months of follow-up, patients showed improvement in pain intensity, stiffness and physical function. Qudsi-Sinclair et al. (31) reported that both genicular nerve block and radiofrequency neurolysis successfully improved pain and functionality in CPSP after knee arthroplasty. Albayrak et al. (32) reported clinical improvement with TENS and lumbar dorsal root ganglion radiofrequency in patients who developed CPSP after knee arthroplasty. Kim et al. (33) reported significant relief of pain and gain in physical function during 24 months of follow-up using the ultrasound-guided femoral nerve cold radiofrequency therapy in CPSP after hip arthroplasty. Zabolotsky et al. (34) showed that pain and analgesic consumption decreased and range of motion increased for two months after C4-5-6 dorsal root ganglion pulsed radiofrequency in a patient with severe chronic pain after shoulder arthroplasty. Orthopaedic surgeons may refer patients to pain physicians more frequently to give a chance to various interventional pain treatments in the management of CPSP after arthroplasty.

The present study showed that orthopaedic surgeons referred their patients with CPSP after arthroplasty to psychiatry at a rate of 5%. There is a need for psychiatric solutions in chronic postsurgical pain management, and Acceptance and Commitment Therapy, Cognitive Behavioural Therapy and Mindfulness are psychiatric treatment methods helpful for chronic postsurgical pain treatment (35). In the present study, orthopaedic surgeons did not focus enough on psychiatric consults in patients with CPSP after arthroplasty.

This study revealed that, orthopaedic surgeons were considering on CPSP after arthroplasty more strongly when at postoperative 12th months than in the postoperative third months. The frequency and severity of chronic postsurgical pain decreases with increasing follow-up time (36). However, orthopaedic surgeons' interest in CPSP after arthroplasty did not diminish with time.

In this study, a statistically significant relationship was found between history of collaboration with pain clinics in their residency programme, the presence of a pain physician in the health centre or city where orthopaedic surgeons are currently working and whether patients were referred to a pain physician. Orthopaedic surgeons' rate of referring patients with CPSP after arthroplasty to a pain clinic is related to accessibility and their past experiences.

One of the limitations of this study is that it is subjective, since physicians' experiences and attitudes were obtained from physicians' own self-evaluation and therefore, the rates given regarding preferences and experiences may not reflect the exact truth. More realistic findings can be obtained with studies that scan the official data.

5. CONCLUSION

Orthopaedic surgeons employ pre-emptive approaches to CPSP after arthroplasty and are engaging well in pharmacological management of CPSP after arthroplasty, but they need to advance further with multidisciplinary treatments and directions.

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