Evaluation of Chronic Pain Development in Patients Undergoing Shoulder Arthroscopy

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Article

Evaluation of Chronic Pain Development in Patients Undergoing Shoulder Arthroscopy

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Abstract: Background: Chronic postoperative pain remains a significant barrier in postoperative management, particularly in patients who have undergone shoulder surgery. We evaluated the predictors of chronic pain following shoulder arthroscopy. **Methods**: This was a retrospective, observational study of patients who underwent shoulder arthroscopy at a university hospital between 2012 and 2017. Telephone contact was established with 178 patients who met the study criteria. Demographic data, comorbidities, preoperative interscalene block application, intraoperative opioid use, and records of postoperative patient-controlled analgesia were obtained by reviewing patient files. Upon contact, each patient's psychological state and pain level were assessed. **Results:** Interscalene block was administered to 33 (18.5%) of the patients, while patient-controlled analgesia was provided to 97 (54.5%). The analgesic method of 48 patients' were not achieved from the records. Chronic pain was identified in 92 patients (51.7%). Body weight, comorbidities, and the combined use of opioids and non-opioids were found to be significant risk factors (p-values of 0.024, 0.016, and 0.010, respectively) for chronic pain. Multivariate Logistic Regression analysis revealed that the risk of chronic pain in patients with comorbidities and combined opioid-non-opioid use was 9.27 times higher than in those without comorbidities. In the presence of comorbidities, the risk of chronic pain was found to be 7.18 times higher in patients who did not use a combination of opioids and non-opioids. **Conclusion:** This study indicates that higher body weight, the presence of comorbidities, and the use of both opioids and non-opioids are significant predictors of increased chronic postoperative pain following shoulder arthroscopy.

Keywords: chronic pain; postoperative pain; arthroscopy

1. Introduction

While open surgical procedures have long been the standard for treating trauma-induced intra-articular pathologies, arthroscopic examination of the lower and upper extremity joints has become the preferred approach in recent years [1–3]. Arthroscopic procedures offer numerous advantages, including expedited treatment, a precise diagnosis, enhanced visualisation of pathological tissue, accelerated healing due to a smaller incision site, a reduced incidence of postoperative complications such as wound discharge, swelling and pain, a shorter duration of hospitalization, and an expedited return to work [1–3]. The objective of surgical intervention is to facilitate the patient's return to the workforce and enhance their satisfaction with the treatment they received. Postoperative pain is defined as the acute onset of pain that commences concurrently with the surgical incision and subsequently diminishes in intensity with the progression of tissue regeneration [4]. The nature of the pain may vary depending on the surgical technique employed, the anaesthetic method used, the size of the wound site, and the patient's physiological, psychological and social status. The alleviation of discomfort is of paramount importance in order to diminish complications associated with

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immobility and to curtail the duration of hospitalisation, thereby reducing expenditures. Conversely, the alleviation or elimination of pain is of paramount importance in the prevention of chronic pain, the preservation of cognitive function and the avoidance of morbidity.

Shoulder arthroscopies represent a significant fraction of orthopaedic operations [5]. A variety of techniques may be employed for the management of postoperative pain. They include analgesic drugs, including both oral and systemic options, as well as intra-articular analgesics, patient-controlled analgesia, and peripheral nerve block techniques [6]. Postoperative analgesia for shoulder surgeries can be provided either by an interscalene block (ISB) or a supraclavicular block [7]. Furthermore, peripheral block techniques reduce the need for opioids [8]. The superficial course of the brachial plexus in the interscalene region renders this block a viable option. The procedure is conducted by means of ultrasonography-guided visualisation of the C5, C6 and C7 roots, which is then followed by the injection of local anaesthetic around those roots [9]. This block provides effective postoperative analgesia by inhibiting the motor and sensory branches. Chronic pain is defined as a condition that has been present for more than three months, and it is accompanied by affective, cognitive and motivational disorders independent of the healing process that lead to functional decline and deterioration in quality of life; chronic pain requires multimodal treatment [10]. However, there is a paucity of studies related to postoperative chronic pain following shoulder arthroscopies. The objective of this study was to evaluate the relationship between intraoperative and psychogenic factors and postoperative chronic pain in patients undergoing shoulder arthroscopy.

2. Materials and Methods

Following approval by the Ankara University Human Research Ethics Committee (date: 27/05/2022; decision no.: İ05-303-22), the records of 369 patients who underwent shoulder arthroscopy in the operating room of the Ankara University Faculty of Medicine, Department of Orthopaedics and Traumatology between January 2012 and December 2017 were retrospectively reviewed. Patients with an American Society of Anesthesiologists (ASA) classification of I-III aged between 18 and 80 years were included in the study. Patients who underwent local anaesthesia in the shoulder and patients who underwent a second shoulder arthroscopy were excluded from the study. Of the patients who satisfied the inclusion criteria, 178 were successfully contacted by telephone and therefore included in the study. The patients were contacted and provided verbal consent for us to use their information. The patients' data were retrospectively recorded from patient files, anaesthesia record forms and the hospital data system. The following demographic data were recorded for all patients: age, gender, weight, height, presence of comorbidities, and postoperative visual analogue scale (VAS) scores. Each patient's psychological status and pain was also evaluated via phone using the Pain Catastrophizing Scale (PCS), the Beck Depression Inventory (BDI) and the State-Trait Anxiety Inventory (STAI-I-II). Patients with ongoing chronic pain were asked to complete the Neuropathic Pain Questionnaire (NPQ) to determine the type of pain they were experiencing. The degree of ongoing pain was then assessed with a VAS score. We amassed the following information: the type of intraoperative analgesia each patient was given, whether the patient used opioids and an ISB and whether patient-controlled anaesthesia was employed postoperatively. Patients undergoing shoulder arthroscopy at the Ankara University Faculty of Medicine are routinely provided with postoperative physical therapy. The results of the postoperative consultation with an algologist were recorded. Shoulder arthroscopy at the Ankara University Faculty of Medicine is performed under general anaesthesia. If the patient accepts the procedure, an ISB could be performed for postoperative analgesia under sedation. Each patient was monitored in a standard way prior to surgery. Sedation was accomplished using midazolam 0.03–0.05. Nasal oxygen was administered at a rate of 4 L/min. The ISB procedure was conducted on the side that was to be operated on under ultrasonography guidance. In preparation for ISB, the patient was positioned supine with their head rotated in the direction opposite to that of the intended surgical site; the head was elevated with support. For the ISB to be performed, the patient's head must be rotated 30 degrees to the opposite side. The ultrasound probe was positioned transversely on the clavicle on the side on which the procedure was to be performed. The external jugular vein tranverses the interscalene groove at the level of the cricoid

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cartilage. Following aseptic preparation, a 25-gauge needle was inserted perpendicularly into the skin at the level of the cricoid cartilage and advanced 2 cm in the medial caudal direction. The patient's neurostimulator response was monitored. Once a neurostimulator response was obtained, the contraction response in the shoulder and arm was then checked. A current ranging from 0.2–0.5 milliamperes was applied to the stimulator and the patient's motor response was confirmed. Once the motor response was confirmed, the next step was to perform an aspiration. It is of the outmost importance to ensure that the injection is not administered intravenously. Between 20 and 30 ml of local anaesthetic was administered. Following confirmation of the presence of sensory paraesthesia via a prick test, the patient was transferred to the operating room. In cases in which the patient did not accept an ISB or was unsuitable to receive one, postoperative analgesia was provided via the intravenous patient-controlled analgesia method. A 500 mg tramadol solution was prepared in 100 ml of 0.9% isotonic saline, and an infusion with a maximum dose of 1 mg/kg/hour and a lock time of 30 minutes was used. Over the course of the study, 33 patients underwent an ISB, and 97 patients received patient-controlled analgesia for postoperative pain management. The blocks within the scope of the study were performed in accordance with the standard technique described above.

Statistical Analysis

The statistical analysis was conducted using the SPSS 11.5 software program. For quantitative variables, mean ± standard deviation and median (minimum-maximum) were employed, while for qualitative variables, number of patients (percentage) was utilised. The Student's t-test was employed to ascertain whether a discrepancy existed between the categories of a qualitative variable comprising two categories and a quantitative variable, provided that the assumptions of normal distribution were satisfied. In the event that the aforementioned assumptions were not met, the Mann-Whitney U test was utilised. In examining the relationship between two qualitative variables, the Chi-square and Fisher-exact tests were employed. The impact of the independent qualitative variable was evaluated through univariate and multivariate logistic regression analysis. The level of statistical significance was set at 0.05.

3. Results

The demographic data of the patients included in the study are presented in Table I. The mean age of the patients was 63.27±8.43 years, with 117 (65.7%) female and 61 (34.3%) male patients. The mean weight and height were 81.88±7.48 kg and 165.99±6.39 cm, respectively. While 92.7% (n=165) of the patients had comorbidities, 20.8% had diabetes (n=37) and 4.5% (n=8) had depression (Table I).

The mean score on the Pain Catastrophizing Scale was 7.84 ± 10.08. According to the Beck Depression Scale, 51.7% of the patients exhibited minimal depression, 29.2% demonstrated mild depression, 16.3% displayed moderate depression, and 2.8% exhibited severe depression. The mean STAII scale score was 48.24 ± 13.36 (Table II).

In this cohort, 10.1% of patients did not receive conventional analgesia, while 89.9% did. Table I illustrates the doses of fentanyl, remifentanil, pethidine, tramadol, metamizole, lornoxicam and paracetamol administered.

An interscalene block was performed in 33 patients (18.5%), while patient-controlled analgesia was employed in 97 patients (54.5%). In the postoperative period, 87.6% of patients underwent physical theraphy and rehabilitation (FTR), while 4.5% were referred to the algology clinic for pain management. Postoperative adverse effects were observed in 12 patients (6.7%), while chronic pain was identified in 92 patients (51.7%). Of the 12 patients who underwent a verbal assessment of neuropathic pain with the NPQ test, eight (66.7%) exhibited positive results (Table I).

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Table I. Demographical variables.

Variables		
Age	Mean.±SD	63.27±8.43
	Median (Min-Max)	63.00 (37.00-79.00)
Gender, n(%)	Female	117 (65.7)
	Male	61 (34.3)
Weight (kg)	Mean.±SD	81.88±7.48
	Median (Min-Max)	82.00 (56.00-120.00)
Height (cm)	Mean.±SD	165.99±6.39
	Median (Min-Max)	165.00 (150.00-180.00)
Comorbidities, n(%)	Absent	13 (7.3)
	Present	165 (92.7)
Diabetes, n(%)	Absent	141 (79.2)
	Present	37 (20.8)
Depression, n(%)	Absent	170 (95.5)
	Present	8 (4.5)
Pain Catastrophizing Scale score	Mean.±SD	7.84±10.08
	Median (Min-Max)	3.00 (0.00-50.00)
Beck Depression Scale, n(%)	Minimal Depression	92 (51.7)
	Mild Depression	52 (29.2)
	Moderate Depression	29 (16.3)
	Severe Depression	5 (2.8)
STAII	Mean.±SD	48.24±13.36
	Median (Min-Max)	46.50 (28.00-78.00)
Opioid-Nonopioid use, n(%)	Absent	18 (10.1)
	Present	160 (89.9)
Fentanyl Dose, n(%)	50 mcg	14 (53.8)
	75 mcg	12 (46.2)
Remifentanil Dose, n(%)	20 mcg	2 (6.5)
	40 mcg	20 (64.5)
	50 mcg	9 (29.0)
Petidine Dose, n(%)	50 mg	48 (100.0)
Tramadol Dose, n(%)	50 mg	2 (1.9)
	100 mg	104 (98.1)
Metamizole Dose, n(%)	1 gr	80 (100.0)
Lornoxicam Dose, n(%)	8 mg	15 (100.0)
Paracetamol Dose, n(%)	1 gr	5 (100.0)
Interscalene block, n(%)	Absent	145 (81.5)
	Present	33 (18.5)
Patient-controlled analgesia, n(%)	Absent	81 (45.5)
	Present	97 (54.5)
FTR, n(%)	Absent	22 (12.4)
	Present	156 (87.6)
Pain service consultation, n(%)	Absent	170 (95.5)
	Present	8 (4.5)
Variables		
Postop side effect, n(%)	Absent	166 (93.3)
	Present	12 (6.7)
Chronic Pain, n(%)	Absent	86 (48.3)
	Present	92 (51.7)

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Neuropathic Pain, n(%)	Negative	4 (33.3)
	Positive	8 (66.7)

SD:Standard deviation, Min.:Minimum, Max.:Maximum.

Table II presents a comparison of demographic variables, conventional analgesic methods, interscalene block and patient-controlled analgesia in terms of chronic pain. The prevalence of chronic pain was 51.3% in women and 52.5% in men. The mean body weight was found to be significantly higher in patients with chronic pain than in patients without chronic pain (p=0.005). The prevalence of chronic pain was significantly higher in patients with comorbidities (54.5%) compared to those without comorbidities (15.4%) (p=0.007). Although not statistically significant, a higher prevalence of chronic pain was observed in patients with diabetes (54.1%) compared to patients without diabetes (51.1%). The prevalence of chronic pain was 37.5% in patients with depression and 52.4% in patients without depression.

A significant difference was found between patients with and without chronic pain in terms of opioid-nonopioid use and pethidine use (p=0.005 and p=0.008, respectively). While chronic pain was observed in 83.3% of patients not using opioid-nonopioid medications, it was seen in 48.1% of patients using such medications. The prevalence of chronic pain was 69.2% in patients who received fentanyl, compared to 48.7% in patients who did not receive fentanyl. The prevalence of chronic pain was observed in 60.0% of patients who received remifentanil, while this rate was 50.0% in patients who did not receive remifentanil. The prevalence of chronic pain was 35.4% among patients who received pethidine, compared to 57.7% among those who did not receive pethidine. The prevalence of chronic pain was 51.9% among patients receiving tramadol and 51.4% among those not receiving tramadol. The prevalence of chronic pain was 48.7% among metamizole-treated patients and 54.0% among non-metamizole-treated patients. The prevalence of chronic pain was 50.0% among patients receiving lorazepam, compared to 51.9% among those not receiving lorazepam. The prevalence of chronic pain was 60.0% among patients who received paracetamol, compared to 51.4% among those who did not receive paracetamol. The incidence of chronic pain was observed to be 45.5% in patients who underwent an interscalene block, in comparison to 53.1% in patients who did not undergo such a block. The prevalence of chronic pain was observed to be 50.5% in patients who underwent patient-controlled analgesia, compared to 53.1% in patients who did not receive patient-controlled analgesia.

Table II. Comparison of demographical variables, conventional analgesia methods, interscalene block and patient-controlled analgesia in terms of chronic pain.

Variables		**Chronic pain**		
		Absent	**Present**	**p value**
Age	Mean.±SD	64.05±8.29	62.55±8.53	0.239[a]
	Median (Min-Max)	65.00 (37.00-78.00)	62.50 (42.00-79.00)	
Gender, n(%)	Female	57 (48.7)	60 (51.3)	0.881[c]
	Male	29 (47.5)	32 (52,5)	
Weight (kg)	Mean.±SD	80.53±7.48	83.13±7.31	**0.005[b]**
	Median (Min-Max)	80.00 (60.00-106.00)	84.00 (56.00-120.00)	
Height (cm)	Mean.±SD	165.84±6.48	166.14±6.33	0.995[b]
	Median (Min-Max)	165.00 (150.00-180.00)	165.00 (155.00-180.00)	
Comorbidity, n(%)	Absent	11 (84.6)	2 (15.4)	**0.007[c]**
	Present	75 (45.5)	90 (54.5)	
Diabetes, n(%)	Absent	69 (48.9)	72 (51.1)	0.746[c]
	Present	17 (45.9)	20 (54.1)	
Depression, n(%)	Absent	81 (47.6)	89 (52.4)	0.485[d]
	Present	5 (62.5)	3 (37.5)	
Opioid-Nonopioid use, n(%)	Absent	3 (16.7)	15 (83.3)	**0.005[c]**
	Present	83 (51.9)	77 (48.1)	

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Fentanyl, n(%)	Absent	78 (51.3)	74 (48.7)	0.053[cc]
	Present	8 (30.8)	18 (69.2)	
Remifentanil, n(%)	Absent	74 (50.0)	74 (50.0)	0.318[c]
	Present	12 (40.0)	18 (60.0)	
Petidine, n(%)	Absent	55 (42.3)	75 (57.7)	**0.008[c]**
	Present	31 (64.6)	17 (35.4)	
Tramadol, n(%)	Absent	35 (48.6)	37 (51.4)	0.948[c]
	Present	51 (48.1)	55 (51.9)	
Metamizol, n(%)	Absent	46 (46.0)	54 (54.0)	0.484[c]
	Present	40 (51.3)	38 (48.7)	
Lornoxicam, n(%)	Absent	78 (48.1)	84 (51.9)	0.888[c]
	Present	8 (50.0)	8 (50.0)	
Paracetamol, n(%)	Absent	84 (48.6)	89 (51.4)	1.000[d]
	Present	2 (40.0)	3 (60.0)	
Interscalene block, n(%)	Absent	68 (46.9)	77 (53.1)	0.427[c]
	Present	18 (54.5)	15 (45.5)	
Patient-controlled analgesia, n(%)	Absent	38 (46.9)	43 (53.1)	0.732[c]
	Present	48 (49.5)	49 (50.5)	

SD: Standard Deviation, Min.:Minimum, Max.: Maximum, a:Student-t test, b:Mann-Whitney U test, c: Chi-square test, d:Fisher-exact test.

Table III presents a comparison of patients with and without chronic pain in terms of pain measurement scales. The analysis revealed a significant difference only in terms of the Pain Catastrophizing Scale scores ($p < 0.001$). The mean Pain Catastrophizing Scale score for patients with chronic pain was 13.79 ± 10.08, while the mean Pain Catastrophizing Scale score for patients without chronic pain was 1.47 ± 4.85. According to the Beck Depression Scale, 44.6% of patients with minimal depression, 65.4% of patients with mild depression, 51.7% of patients with moderate depression and 40.0% of patients with severe depression reported chronic pain. The mean score on the STAII scale was 49.98±13.43 in patients with chronic pain and 46.38±13.11 in patients without chronic pain.

Table III. Comparisons of Scales in terms of Chronic Pain.

Variables		**Chronic Pain**		
		Absent	**Present**	**p value**
Pain Catastrophizing Scale score	Mean.±SD	1.47±4.85	13.79±10.08	**<0.001[a]**
	Median (Min-Max)	0.00 (0.00-32.00)	12.50 (2.00-50.00)	
Beck Depression scale, n(%)	Minimal Depression	51 (55.4)	41 (44.6)	0.104[b]
	Mild Depression	18 (34.6)	34 (65.4)	
	Moderate Depression	14 (48.3)	15 (51.7)	
	Severe Depression	3 (60.0)	2 (40.0)	
STAII	Mean.±SD	46.38±13.11	49.98±13.43	0,058[a]
	Median (Min-Max)	44.00 (28.00-76.00)	49.00 (28.00-78.00)	

SD: Standard Deviation, Min.:Minimum, Max.: Maximum, a:Mann-Whitney U test, b:Fisher-exact test.

The results of the univariate logistic regression analysis, as presented in Table IV, revealed that weight, comorbidity and opioid-nonopiod use were significant risk factors affecting chronic pain ($p=0.024$, $p=0.016$ and $p=0.010$, respectively). The risk of chronic pain decreased by a factor of 0.979 for each additional year of age, while the risk increased by a factor of 1.008 for each additional centimetre of height and 1.051 for each additional kilogram of weight. The risk of chronic pain in patients with comorbidities was found to be 6.600 times higher than in those without comorbidities. The risk of chronic pain was found to be 1.206 times higher in patients with mild depression, 2.833

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times higher in patients with moderate depression and 1.607 times higher in patients with severe depression, in comparison to patients with minimal depression, according to the Beck Depression Scale. An increase of one unit on the STAII scale score is associated with a 1.021-fold increase in the risk of chronic pain. The risk of chronic pain was found to be 5.390 times higher in patients who did not use opioid-nonopioids compared to patients who used opioid-nonopioids. The risk of chronic pain in patients who did not undergo an interscalene block was found to be 1.359 times higher than in patients who did. The risk of chronic pain in patients who did not receive patient-controlled analgesia was found to be 1.108 times higher than in patients who did. The variables of weight, comorbidity, and opioid-nonopioid use, which were identified as significant in the univariate logistic regression analysis, were incorporated into the multivariate logistic regression analysis.

Table IV. Univariate logistic regression results for risk factors affecting chronic pain.

Variables (reference)		β	SD	p value	Odds Ratio	95% Confidence Interval Lower-Upper Limit
Age		-0.021	0.018	0.238	0.979	0.945-1.014
Height		0.008	0.024	0.750	1.008	0.962-1.055
Weight		0.050	0.022	**0.024**	1.051	1.006-1.098
Comorbidity (Absent)	**Present**	1.887	0.84	**0.016**	6.600	1.418-30.709
Beck Depression Scale (Minimal Depression)	**Mild Depression**	0.187	0.937	0.842	1.206	0.192-7.561
	Moderate Depression	1.041	0.958	0.277	2.833	0.433-18.535
	Severe Depression	0.474	0.986	0.630	1.607	0.233-11.092
STAII		0.021	0.012	0.074	1.021	0.998-1.044
Opioid-Nonopioid Use (Present)	**Absent**	1.684	0.652	**0.010**	5.390	1.502-19.342
Interscale Block (Present)	**Absent**	0.307	0.387	0.428	1.359	0.636-2.902
Patient-controlled Analgesia (Present)	**Absent**	0.103	0.301	0.733	1.108	0.614-2.001

β: Beta coefficient, SD:Standard deviation.

Table V presents the results of a multivariate logistic regression analysis of the risk factors affecting chronic pain. The analysis revealed that comorbidity and opioid-nonopioid use were significant risk factors (p=0.010, p=0.006, respectively). The risk of chronic pain in patients with comorbidities was found to be 9.266 times higher than in those without comorbidities when opioid-nonopioid use was present. In the presence of comorbidity, the risk of chronic pain was found to be 7.184 times higher in patients with opioid-nonopioid use compared to patients without opioid-nonopioid use.

Table V. Multivariate Logistic Regression Results for Risk Factors Affecting Chronic Pain.

Variables (reference)		β	SD	p value	Odds Ratio	95% Confidence Interval Lower-Upper Limit
Constant		-2.189	0.853	**0.010**	-	-
Comorbidity (Absent)	**Present**	2.226	0.860	**0.010**	9.266	1.717-50.006
Opioid-Nonopioid use (Present)	**Absent**	1.972	0.720	**0.006**	7.184	1.751-29.481

β: Beta coefficient, SD:Standard deviation.

4. Discussion

Shoulder arthroscopy is associated with a very low mortality rate (i.e., 0.04%), and it has been widely practised all over the world [11–13] . Ninety-two of the 178 patients who underwent the

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procedure in this study developed chronic pain. Shin et al. reviewed a total of 27,072 surgical cases from the American Board of Orthopaedic Surgery database between 2012 and 2016 and noted persistent pain in 504 cases (1.86%) [14]. Those authors also noted that the incidence of chronic pain was significantly higher in females. However, we did not find any significant difference in chronic pain development between males and females. This finding may be attributed to the retrospective nature of our study and the relatively small number of patients included in our analysis. We noted that chronic pain developed in 51.7% of our patients. Li et al. studied 6,524 individuals aged 60 years and above and examined the relationship between chronic pain and body mass index (BMI) [15]. Chronic pain development was determined based on the individuals' own definitions in accordance with the definition of the International Association for the Study of Pain (IASP). Obesity was evaluated according to BMI, with a cutoff of 28.0 kg/m² accepted as corresponding to obesity. Li et al. used binary logistic regression analysis. Roughly half of normal-weight individuals (46.9%)and 60.8% of obese individuals experienced chronic pain. Li et al. found a direct relationship between BMI and the occurrence of chronic pain [15]. In our study, we observed that the average body weight of individuals with chronic pain after shoulder arthroscopy was larger than the average body weight of individuals without chronic pain (83.13 ± 7.31 vs. 80.53 ± 7.48 kg).

Masselin-Dubois et al. noted the role of psychological factors in the development of postoperative chronic pain in female and male patients undergoing total knee arthroplasty and female patients undergoing breast surgery for cancer. The study included individuals aged between 18 and 85 who underwent surgery between May 2008 and September 2011 at Raymond Poincare Hospital (APHP, Garches, France). The authors examined the relationship between state anxiety (SA), trait anxiety (TA) and the PCS and the development of chronic pain three months after surgery in 89 male and 89 female patients who underwent total knee arthroplasty and 100 female patients who underwent breast surgery. The data revealed a correlation among SA, TA and PCS values and the development of chronic pain following breast surgery and total knee arthroplasty. It has been postulated that these parameters be regarded as psychological risk factors in the aetiology of chronic pain [16]. We examined correlations among the PCS, the BDI and the STAI-I-II with the development of chronic pain after shoulder arthroscopy. Our data revealed a significant positive correlation between the development of chronic pain and PCS, there was no significant correlation between the development of chronic pain and either the BDI or STAI-I-II. We noted that the administration of multimodal analgesia, comprising both opioid and non-opioid drugs, resulted in a reduction in the incidence of chronic pain. However, when we evaluated opioid and non-opioid drugs separately we found no significant effect on chronic pain, with the exception of meperidine. The use of peripheral blocks as prememptive analgesia to block afferents without sensitization to incision pain plays an important role in intraoperative and postoperative pain control and is known to reduce the need for opioids [8]. Nevertheless, there is a paucity of evidence to suggest that the use of peripheral blocks can reduce the incidence of chronic pain. Our results indicate that the ISB method, when applied preoperatively, is not an effective intervention for preventing the occurrence of postoperative chronic pain. It is critical to consider the demographic characteristics of patients when examining the occurrence of chronic pain; it has been established that psychological factors contribute to the development of chronic pain [17]. We investigated the correlation between diabetes mellitus and chronic pain development in our study. Diabetes mellitus is a recognised risk factor for neuropathic pain [18]. Nevertheless, our study did not identify a significant correlation between diabetes mellitus and chronic pain development. We also investigated the correlation between depression and chronic pain development. Given that this investigation was a retrospective study, it was not possible to adequately evaluate the level of each patient’s depression. The patients may have provided inaccurate information given that they were contacted at least one year after their surgical procedure,. We accordingly found that the incidence of chronic pain was not markedly elevated in patients with depression. Additional prospective studies are necessary to elucidate this issue. When we investigated diabetes mellitus and depression in combination as a single comorbidity, we noted a significantly higher prevalence of chronic pain in patients with both diabetes mellitus and depression. We accordingly determined that the prevalence of persistent pain in patients who underwent

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shoulder arthroscopy was considerable. It is a well-established phenomenon that chronic pain is associated with persistent acute pain. It is crucial to utilise a combination of non-opioid and opioid analgesics and regional anaesthetic techniques for the management of acute pain to prevent the development of persistent chronic pain. Follow-on randomised, controlled studies are necessary in order to ascertain which method is the most effective for managing chronic pain.

5. Conclusions

There is no study on the development of chronic pain in shoulder arthroscopies. The aim of this study was to evaluate the development of chronic pain in patients who underwent shoulder arthroscopy and to investigate whether the development of intraoperative analgesia methods applied in patients with chronic pain affected the outcome. The results showed how important acute pain control is in the development of chronic pain in shoulder arthroscopies and that psychological status is a risk factor. When all these are evaluated, it is of great importance to provide intraoperative acute pain control and to consider the psychological illnesses of the patients. The results obtained showed that demographic data can also be a risk factor in the development of chronic pain. However, more studies are needed to standardize all these.

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