Chronic use of opioids decreases the effect of continuous peripheral nerve blocks

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Abstract

Introduction

Acute pain is a major contributor to morbidity in the orthopaedic ward. Regional anaesthesia in the form of continuous peripheral nerve blocks (cPNBs) has been associated with a lower opioid consumption and thus a lower rate of adverse effects[1].It has been suggested that single shot local analgesics have a lower efficacy in chronic opioid users than opioid naive patients[2], however, this has not yet been shown with cPNBs.Patients, who use opioids on a daily basis, have longer hospital stays and worse outcomes after surgery[3]. This study aims to examine the efficacy of cPNBs in chronic opioid users compared to opioid naive patients.

Methods

In this single-centercohort study, conducted at a level 1 trauma centre,data were analysed based on patient's pre-operative intake of opiates. Patients were defined as opioid-tolerant if the preoperative daily opioid intake was more than 90 oral milligram morphine equivalents.A cPNB was indicated when severe and prolonged (>24h) post-operative pain was expected after orthopaedicsurgery. The efficacyof the catheter was assessed by acute pain service nurses on daily visits in the general ward. Catheters were deemed ineffective either if the patient had the catheter removed due to lack of effect or the daily reported Numeric Rating Scalewas 4 or above. If neither of these criteria were met, the catheter was deemed effective. Patients were compared regarding demographics and efficacy of catheters using Student's T-test or Mann-Whitney U-test, depending on normality distribution tests. Sensitivity analysis was conducted to adjust for significant baseline differences.

Results

A total of 417patients representing a total of 852catheters wasincluded.Chronic opioid users constituted 35 patients (8.4%), representing 74 catheters (8.7%).No significant differences were observed in regard to pain scores ($p = 0.063$), nor when comparing groups for reason for removal ($p = 0.22$). It was found that 18.3% of the catheters administered in opioid-naive patients was ineffective whereas 29.7% was ineffective in chronic opioid users ($p = 0.025$).The groups differed on ASA score with the chronic users being ASA class 3 (40.0% vs. 17.4%) and opioid naive patients being ASA class 2 (49.2% vs. 37.1%) ($p < 0.001$).Indication for catheterdiffered significantly with a great proportion of ambulant indications (8.1% vs. 2.1%) in the chronic user group ($p =0.018$).Sectordiffered with foot (21.9% vs. 10.8%), children and reconstruction (11.3% vs. 5.4%) being significantly more common in the naive group ($p < 0.001$).After adjusting for differences in ASA class, indication, and subspecialty,significantly less catheters were effective in chronic opioid users ($p=0.009$).

Conclusions

The study demonstrated that the efficacy of continuous peripheral nerve blocks may be significantly lower in patients with preoperative chronic opioid use compared with opioid naive patients.

Table 1

Demographics and catheter data in 417 patients for orthopaedic surgery with continuous peripheral nerve blocks representing 852 catheters. Age, gender, American Society of Anesthesiologists (ASA) classification and mean duration of catheters were all examined pr. Patient (n= 417) while Indication for catheter, sector, catheter placement, duration of catheters, mode of NRS, reason for removal and effective catheter were analyzed pr. Catheter (n=852)

		Opioid Naive (n=778)	Chronic user (n= 74)	Total (n=852)	p-value
Age (mean (sd))	Years	49.5 (23.5)	48.7 (21.9)	49.4 (23.3)	0.85
Sex (%)	Male	212 (55.5)	17 (48.6)	229 (54.9)	0.54
ASA Classification n (%)	ASA Class 1	112 (29.5)	8 (22.9)	120 (28.9)	
	ASA Class 2	187 (49.2)	13 (37.1)	200 (48.2)	
	ASA Class 3	66 (17.4)	14 (40.0)	80 (19.3)	
	ASA Class 4	15 (3.9)	0 (0.0)	15 (3.6)	<0.001
Indication for catheter n (%)	Perioperativepain	708 (94.5)	67 (90.5)	775 (94.2)	
	Woundpain	20 (2.7)	1 (1.4)	21 (2.6)	
	Other; Ischemic Pain	5 (0.7)	0 (0.0)	5 (0.6)	
	Ambulant	16 (2.1)	6 (8.1)	22 (2.7)	0.018
Sector n (%)	Foot	164 (21.9)	8 (10.8)	172 (20.9)	
	Trauma	302 (40.3)	30 (40.5)	332 (40.3)	
	Wound/amputation	60 (8.0)	7 (9.5)	67 (8.1)	
	Children	85 (11.3)	4 (5.4)	89 (10.8)	
	Alloplasty	77 (10.3)	15 (20.3)	92 (11.2)	
	Other	54 (7.2)	6 (8.1)	60 (7.3)	<0.001
	Not specified	7 (0.9)	4 (5.4)	11 (1.3)	
Catheter placement n (%)	Saphenus	259 (33.3)	21 (28.4)	280 (32.9)	
	Femoral	132 (17.0)	12 (16.2)	144 (16.9)	
	Poplitea	304 (39.1)	28 (37.8)	332 (39.0)	
	Infraclavicular	9 (1.2)	1 (1.4)	10 (1.2)	
	Ischiadicus	72 (9.3)	9 (12.2)	81 (9.5)	
	Other	1 (0.1)	3 (4.1)	4 (0.5)	<0.001
Duration of catheters median [iqr]	days	1 [0.9, 3.0]	1 [0.9, 2.9]	1 [0.9, 3.0]	0.11
Catheters pr. patient mean (sd)	Number	2.1 (1)	2.1 (1.2)	2.1 (1)	0.77
Mode of NRS n (%)	None (NRS 0)	433 (57.0)	44 (60.3)	477 (57.3)	
	Mild (NRS 1-3)	216 (28.5)	12 (16.4)	228 (27.4)	
	Medium (NRS 4-6)	79 (10.4)	14 (19.2)	93 (11.2)	
	Servere (NRS 7-	25 (3.3)	3 (4.1)	28 (3.4)	

	10)				
	Not relevant	6 (0.8)	0 (0.0)	6 (0.7)	0.063
Reason for removal n (%)	Planed	547 (80.9)	50 (72.5)	597 (80.1)	
	No effect	80 (11.8)	15 (21.7)	95 (12.8)	
	Displaced	28 (4.1)	2 (2.9)	30 (4.0)	
	Discharged	4 (0.6)	0 (0.0)	4 (0.5)	
	Leakage	12 (1.8)	2 (2.9)	14 (1.9)	
	Redness	5 (0.7)	0 (0.0)	5 (0.7)	0.22
Effectiveness ofcatheter (n (%)	Not-effective	141 (18.3)	22 (29.7)	163 (19.3)	0.025

Works cited

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