

Regional anaesthesia for postoperative pain management after liver resection

Darius Trepenaitis¹,

Tadas Česnaitis²,

Andrius Macas¹

¹ Department of Anesthesiology,
Hospital of Lithuanian
University of Health Sciences
Kaunas Clinics, Kaunas,
Lithuania

² Faculty of Medicine,
Medical Academy,
Lithuanian University
of Health Sciences,
Lithuania

Background. Pain is the most common complication in the postoperative period. If adequate treatment is not taken, it can transform to chronic pain. Postoperative pain brings a lot of social, psychological and financial problems for patients and their families.

Materials and methods. This prospective study included 30 patients after laparotomic liver resection operation. Patients were randomly assigned to Infiltrated or Control groups. An infiltration of 40 ml levobupivacaine 0.25% solution to the operation cut edges was performed to the Infiltrated group. The pain was evaluated using the numerical rating scale after 2, 5, 12, 24, 48 hours and 1 month after the operation. Our aim was to determine the effect of local anesthesia in the operation wound. The total usage of morphine and any side effects were registered.

Results. A statistically significant reduction in pain was observed in the Infiltrated group in all evaluation periods. Opioids usage was higher in the Control group almost by 4 times and adverse effects were 9 to 1 compared to the Infiltrated group.

Conclusions. Surgical wound infiltration with local anesthetic for postoperative pain management after liver resection operations has a positive effect on postoperative pain reduction and leads to lesser usage of opioid analgetics. As a result, there is a less chance of opioids induced adverse effects.

Key words: postoperative pain management, infiltration analgesia, local anesthetic, levobupivacaine

INTRODUCTION

Effective postoperative analgesia can be achieved using infiltration with local anesthetic just before

closing the operation cut. This technique is quick, cheap and does not require any special skills. Postoperative pain management is very important for smooth patient recovery and should not be delayed (1). The first pain usually gives a huge discomfort and it is inevitable if we use only the “drugs on demand” scheme. If infiltrative analgesia is used, it is possible to avoid intense pain after the awakening (2).

Correspondence to: Darius Trepenaitis, Department of Anesthesiology, Medical Academy, Lithuanian University of Health Sciences, Eivenių 2, LT-50028 Kaunas, Lithuania.
E-mail: darius.trepenaitis@kaunoklinikos.lt

The drugs used for this procedure need to meet a few requirements – they should be low in toxicity, have a long-lasting effect and the patient should not be sensitive to them. The best choice for procedure should be levobupivacaine or ropivacaine. Their onset is about 20 minutes and the effect lasts for approximately 360 minutes (3, 4). Levobupivacaine is more popular because it has almost the same characteristics as ropivacaine, but it is much cheaper. On the other hand, ropivacaine is slightly less cardiotoxic and implies less adverse effects (4).

The usage of this technique varies from simple traumatology procedures to vast abdominal surgeries. It is very popular in obstetrics and gynecology. After completed meta-analysis by Moyniche et al. and Karthiksalingam et al., it is seen that infiltration of local anesthetics in any abdominal surgery pain management is beneficial (5, 6). Not only there is a positive effect in pain reduction, but it is also cost-efficient, because less postoperative drug usage, faster recovery and faster discharge from hospital are observed (2). The best effect for postoperative pain reduction is visible after inguinal hernia plastic surgeries (5, 7). Other types of operations need further attention by performing more studies and meta-analysis for confirmation of the infiltration analgesia positive effect on postoperative pain management.

In our study we chose patients after liver resection operations, because this type of procedure requires a vast transversal operation cut and simple “drug only” postoperative pain management needs lots of opioids and other painkillers.

MATERIALS AND METHODS

This study was approved by the Bioethics Centre of the Lithuanian University of Health Sciences and we collected data for 13 months (February 2011 – March 2012) in the Post-anaesthesia Care Unit of the General Surgery Department, patients' wards in the Hospital of Lithuanian University of Health Sciences Kaunas Clinics and by phone. This prospective study included patients after laparotomic liver resection operation who gave their written consent by participating in this study. Then patients were randomly assigned to the Infiltrated or Control group. The data we collected included gender, age, pain evaluation after 2, 5, 12, 24, 48 hours and 1 month. Our aim was to determine the effect to

local anesthesia in the operation wound so patients were asked to describe the pain in the cut area. Also we registered the total usage of morphine and any side effects.

The Infiltrated group received an infiltration of 40 ml levobupivacaine 0.25% solution to the operation cut edges before the closure of the wound. The Control group received no infiltration. This procedure was performed by the operating surgeon. The intensity of pain was assessed by one researcher (except night time) using the numerical rating scale from 0 (no pain) to 10 (deadful pain). We chose this scale because patients had difficulties in moving after the operation and this gave inconvenience in filling the visual analogue scale for pain evaluation. All patients had oral premedication of diazepam 10 mg in the evening and morning before the operation. After the operation, on the first and second day 50 mg of petidine hydrochloride was administered 3–4 times a day, on other days if case needed. All the time in case of severe pain an adequate dose of opioide analgetics (morphine) was administered using an infusion pump.

Statistical analysis was performed using SPSS 17.0. The Student's t-test and Chi-square test were used to compare the data. $P < 0.05$ was considered to be a statistically significant difference.

RESULTS

A total of 30 patients were enrolled in the study: 16 women (53.30%) and 14 men (46.70%). The average age was 58.37 ± 9.81 years. All patients had liver resection due to metastatic or primary cancer, or echinococcus infection.

Pain evaluation means in Control and Infiltrated groups were as follows: 7.33 ± 1.80 and 4.27 ± 2.28 after 2 hours, 5.40 ± 1.40 and 2.53 ± 1.55 after 5 hours, 4.00 ± 1.36 and 1.07 ± 0.80 after 12 hours, 4.60 ± 1.24 and 1.33 ± 0.90 after 24 hours, 5.07 ± 1.22 and 0.93 ± 0.96 after 48 hours, 3.80 ± 1.21 and 0.77 ± 1.01 after one month. As we discovered, in all evaluation periods pain was significantly lower for patients from the Infiltrated group, $p < 0.001$ (Figure).

The total morphine consumption in the Control group was 555 mg with 37.00 ± 14.61 mg per patient. The Infiltrated group had almost 4 times lower total consumption – 140 mg with 9.33 ± 6.23 mg per patient.

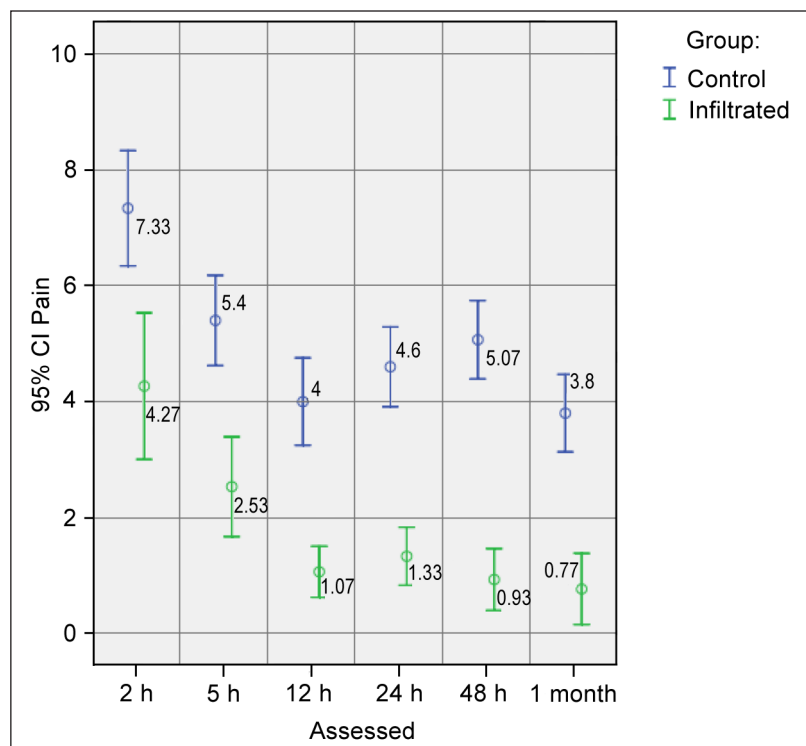


Figure. Means of pain evaluation in both groups

Adverse effects (mainly nausea, vomiting, headache and dizziness) in the Control group occurred 9 times compared with the Infiltrated group where these effects occurred only one time (Table) with statistically significant difference, $p < 0.05$.

Table. Adverse effects in both groups

		Group		Total
		Control	Infiltrated	
Adverse effects	No	6	14	20
	Yes	9	1	10
Total		15	15	30

DISCUSSION

It is a fact that postoperative pain, especially after procedures requiring vast tissue damage, needs special attention all the time. Standard technique dealing with this pain is to administer an adequate dose of opioids or other analgetics, but this procedure has its own complications which can give an additional discomfort for the patient. Local surgical wound infiltration brings many benefits considering dealing with the postoperative pain. With the new generation of local anesthetics, adverse effects such as cardiotoxicity are minimized and lon-

ger effect time is achieved. Due to pain reduction after the operation, patients recover faster, and, as we noticed, there may be a positive effect for chronic pain prevention. To give the weight for this statement, further study must be carried out, but no doubt a postoperative local wound infiltration with local anesthetic should be thought about after any operation requiring bigger tissue damage.

CONCLUSIONS

Surgical wound infiltration with local anesthetic for postoperative pain management after liver resection operations has a positive effect on postoperative pain reduction and leads to lesser usage of opioid analgetics. As a result, there is a less chance of opioids induced adverse effects.

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Darius Trepenaitis, Tadas Česnaitis, Andrius Macas

VIETINĖ ANESTEZIJA MALŠINANT POOPERACINĮ SKAUSMĄ PO KEPENŲ REZEKCIJOS OPERACIJOS

Santrauka

Įvadas. Skausmas – dažniausia pooperacinio laikotarpio komplikacija, kuri, nesiėmus prevencinių priemonių, virsta lėtiniu skausmu, sukeliančiu daug socialinių, psichologinių bei finansinių problemų pacientams ir jų šeimoms.

Tyrimo medžiaga ir metodai. Tyrime dalyvavo 30 pacientų po kepenų rezekcijos operacijos, kurie atsitiktinės atrankos būdu buvo priskirti „Infiltracinei“ ir „Kontrolinei“ grupei. „Infiltracinės“ grupės pacientams operacijos pabaigoje chirurginio pjūvio kraštai būdavo infiltruojami 40 ml 0,25 % levobupivakaino tirpalu. Pasitelkus skaitinę skausmo vertinimo skalę (1–10 balų), skausmas buvo vertinamas praėjus 2, 5, 12, 24, 48 valandoms ir mėnesiui po operacijos. Mūsų tikslas buvo įvertinti pooperacinį žaizdos skausmo malšinimo efektyvumą taikant infiltracinę nejautrą; taip pat buvo registruojamas bendras morfino suvartojimas ir atsirandantys šalutiniai reiškiniai.

Rezultatai. „Infiltracinėje“ grupėje pastebėtas statistiškai svarus skausmo sumažėjimas visuose vertinimo etapuose. Beveik 4 kartus daugiau suvartota opioidų „Kontrolinėje“ grupėje. Šalutiniai poveikiai „Kontrolinėje“ grupėje pasireiškė 9 kartus, o „Infiltracinėje“ – tik kartą.

Išvados. Operacinės žaizdos infiltracija vietiniais anestetikais yra naudinga pooperacinio skausmo malšinimo procedūra. Taip suvartojama mažiau opioidinių analgetikų, sumažėja opioidų šalutinio poveikio rizika.

Raktažodžiai: pooperacinio skausmo malšinimas, infiltracinė anestezija, vietiniai anestetikai, levobupivakainas