

# Anesthesia and Research Meeting

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*Postoperative regional pain analgesia with an elastomeric pump device after shoulder surgery : comparison of levobupivacaine versus ropivacaine.* B. BILLET, G. SAS, J. DE COSTER, Ph. DEBEER, E. VANDERMEERSCH. Dienst Anesthesie UZ. Leuven, Pellenberg.

## Introduction

Moderate to major shoulder surgery is frequently associated with severe postoperative pain, especially within the first 48 hrs. A continuous interscalene brachial plexus nerve block can provide prolonged postoperative analgesia. Although compared frequently to racemic bupivacaine, little is known about the effects of levobupivacaine (LEVO) compared to another widely used long acting local anaesthetic, ropivacaine (ROPI) (1). The aim of this prospective double-blind randomised study was to compare the effectiveness in postoperative analgesia of ROPI versus LEVO, administered by elastomeric pumps in patients with a perineural catheter placed in the interscalene brachial plexus, after shoulder surgery.

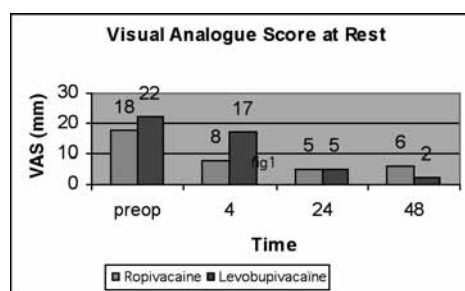
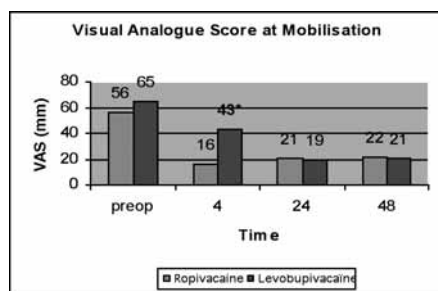
## Methods

The study was conducted at the University Hospital Pellenberg. After obtaining institutional ethical committee approval and written informed consent, we prospectively enrolled thirty patients scheduled for elective shoulder surgery. An interscalene brachial plexus catheter was inserted, using the Boezaart technique (2), by an experienced anaesthetist. A surgical block was performed with 30 ml mepivacaine 1% with epinephrine 1:200.000. General anaesthesia (remifentanyl, propofol and rocuronium) was induced after an effective sensory block was demonstrated. After surgery a disposable elastomeric pump device (Dosi-Fuser®, LEVENTON ; 5 ml/h during 48 hrs) was attached, either containing 250 ml ROPI 0,2% or 250 ml LEVO 0,125%. Follow-up was performed with the visual analogue scale (VAS) from 0 mm ('no pain') to 100 mm

(worst imaginable pain), 4 hrs, 24 hrs and 48 hrs after surgery. Rescue pain medication protocol consisted of subsequently paracetamol (15mg/kg), ketorolac (0,5 mg/kg) and tramadol (3mg/kg). Data were analysed using the 6.0 software package statistica. Multiple comparisons were made using analysis of variance (ANOVA). Categorical data were analysed using either chi-square or the Fisher exact test as appropriate. A p-value < 0.05 was considered significant.

## Results

Three of the thirty patients that were enrolled in this study did not complete the study, due to block failure. There were no demographical significant differences between the two groups and surgical procedures were comparable in the two groups. Figure 1 shows the VAS score at rest for the two groups preoperatively and till 48 hrs postoperatively. The mean VAS score ranged between 2 and 17 mm. There was no statistically significant difference. Figure 2 shows VAS score at mobilisation of the operated arm. There were no statistically significant differences between the two groups, except for the VAS score in the LEVO-group 4 hrs postoperatively (p < 0.05). Eight patients received no additional pain medication at all, nine received only paracetamol (range 1-8 g over 48 hrs) for break-through pain. Twelve patients received paracetamol and additional ketorolac. Five patients received paracetamol, ketorolac and tramadol (50-400 mg over 48 hrs). There were no significant differences in satisfaction between the groups. No side effects were noted except for one patient who suffered a diaphragm hemiparesis.



## Discussion and Conclusion

As studied before ropivacaine is 40% less potent than levobupivacaine (3), for this reason we used concentration of levobupivacaine 40% lower than that of ropivacaine. Adequate postoperative analgesia was achieved with continuous peripheral nerve block catheters using an elastomeric pump device after shoulder surgery, with low incidence of side effects. We were unable to detect any significant differences between ropivacaine and levobupivacaine. One drawback of this study is obviously the small number of patients. Further careful evaluation of a larger group of patients is required to determine the overall safety of this technique. Finally, the cost-effectiveness needs to be evaluated.

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2. Boezaart A. P., de Beer J. F., *et al.*, A new technique of continuous interscalene nerve block, CANADIAN JOURNAL OF ANESTHESIA, **46**, 275-281, 1999.
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*Penile Nerve Block with Levo-bupivacaine 0,25% or Ropivacaine 0,25% produced similar analgesic Effects in Children after Circumcision.* B. BRYON, J. BERGHMANS, D. VAN DER AUWERA, G. VAN WESEMAEL, J. DUCHATEAU, E. VANDERMEERSCH, D. HIMPE. ZNA Middelheim, Lindendreef 1, 2020 Antwerpen.

### Introduction

Ropivacaine and levo-bupivacaine have never been compared in equipotent doses for penile nerve blockade (PNB). The hypothesis was tested that both agents are equivalent to produce pain-free recovery in children being circumcised under general anesthesia combined with PNB.

### Methods

The study design was double-blinded, prospective and randomized. After institutional approval and parental consent 119 boys (ASA 1, aged 1-4 years), scheduled for circumcision, received a 0.5 mg/kg bolus of either ropivacaine 0.25% (group 1) or levobupivacaine 0.25% (group 2), using the 'two injections tech-

nique', penetrating the superficial fascia. The POCIS (1) (Pain Observation Scale for Young Children) was used for pain assessment. Calculated sample sizes around  $2 \times 60$  subjects should provide a statistical power of 80% when considering 20% probability differences of having a POCIS  $> 0$  as clinically relevant. The Kaplan-Meier (KM) test was used for statistical analysis.

### Results

Demographically and clinically groups were comparable. In the 119 patients (pts) enrolled, PNB's were successful with levobupivacaine and ropivacaine in respectively 54 (92,5%) and 51 (85%) pts. Figure 1 displays the respective probabilities of having a pain-free recovery over 300 minutes following surgery.

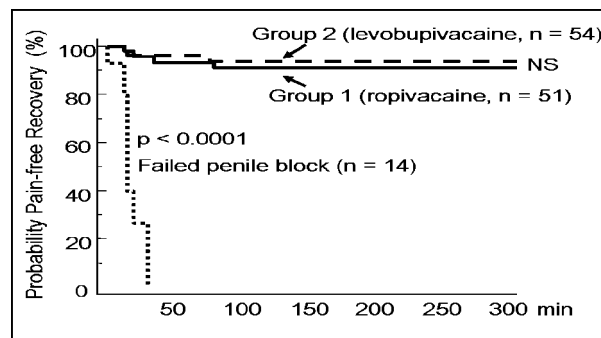


Fig. 1. — KM curves were nearly identical for group 1 and 2 (NS : not statistical significant). Failure of PNB reduces pain-free recoveries significantly ( $p < 0.0001$ ).

### Discussion

No statistical difference was found between groups. Although group 2 has a slightly higher failure rate, we attributed the failed blocks mainly to the learning curve. Patients were discharged before PNB wore off.

### Conclusion

With the doses and concentrations used, having a successful PNB is clearly more important than the

choice between a low dose of either ropivacaine or levobupivacaine.

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*Progression from systemic to spinal analgesia in oncology.* B. BUEKERS, M.D., G. HANS, M.D., M. VERCAUTEREN, M.D., Ph.D. Universital Hospital Antwerp, Department of Anesthesiology, Wilrijkstraat 10, 2650 Edegem, Belgium.

### Introduction

The main goal in pain management of the oncologic patient is to ensure as much comfort as possible. The world health organisation provided a framework for the rational use of analgesic medication by means of a three step ladder. However ten to twenty percent of the oncologic population will still experience severe pain resistant to this analgesic regimen. Therefor interventional analgesic techniques, such as drug administration by a spinal catheter, have been proposed as a fourth rung on the analgesic ladder (1). Moreover, the principle of a stepwise approach to pain management has increasingly been questioned.

### Methods

By means of ten case reports over a period of three months. Comparison of the analgesic effect

(Visual Analogue Scale 0-10) after spinal drug delivery (porth-a-cath) in oncologic patients with severe pain resistant to the conservative WHO-three step analgesic regimen.

### Results

All ten oncologic patients where in excruciating pain notwithstanding the systemic high-dose opioids (and adjuvants) analgesic regimen (WHO rung three). Initiation of spinal drug delivery resulted in a significant decrease of pain ( $p < 0.05$ ). Hereby also significantly improving the patient's comfort. On the basis of our cases we were able to calculate a 1:36 conversion ratio from oral to spinal opioid administration.

| Patient                   | F.V. | C.R. | G.J. | H.C. | P.V. | S.I. | V.A. | S.N. | G.F. | H.E. | Mean |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|
| VAS pre-Spinal analgesia  | 9    | 8    | 9    | 6    | 7    | 9    | 9    | 7    | 8    | 7    | 7,9  |
| VAS post-Spinal analgesia | 3    | 1    | 2    | 2    | 3    | 2    | 6    | 4    | 4    | 3    | 3,0  |

### Discussion

With this study we want to emphasize the importance of timing and decisiveness in the management of malignant pain syndromes and the specific role of spinal drug delivery. We support the addition of a fourth rung on the ladder, but more importantly we emphasize the importance of a more rapid transition to these specialised and more invasive analgesic approaches (Elevator vs. Ladder). The spinal drug delivery is very effective in many cases of malignant pain where the conservative three step analgesic regimen failed. This increased analgesic response is explained by the combination of a more precisely targeted delivery of opioids, the eventually addition of local anaesthetics to the therapeutic regimen, the preceding long use of strong opioids and the specific pathophysiological condition of the involved patient (2).

### Conclusion

In all too many cases physicians cling on to the conservative (WHO inspired) therapeutic three step

analgesic ladder. Malignant (3) pain requires a more aggressive pain regimen with less reluctance towards more invasive analgesic strategies such as the aforementioned spinal drug delivery by a low profile porth-a-cath system.

### References

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*SLIPA : A New Supraglottic Airway Device.* K. CROMBEZ, M.D., J. DE COSTER, M.D., E. VANDERMEERSCH, M.D., Ph.D. Department of Anesthesiology, University Hospital Gasthuisberg, Leuven, Belgium.

### Introduction

The SLIPA is a supraglottic airway device, recently introduced as an alternative to the LMA (1). The LMA has an inflatable cuff to create a seal between the artificial airway and the tissues around the entrance to the larynx (2). The SLIPA is expected to create a leak proof connection based on its particular shape, which is believed to fit perfectly to the anatomical structures around the entrance of the larynx. Clinical data on the use of the SLIPA are scarce. No data are available on the pressures the device exerts on the surrounding tissues.

### Methods

Institutional ethical approval was obtained. Twenty-two fasted healthy patients with ASA status I-II scheduled for surgery permitting the use of a supraglottic airway were enrolled. The correct size of SLIPA airway should be one that matches the dimension across the thyroid cartilage, from cornu to cornu (3). Fluid filled pressure chambers were attached to the toe, the heel and one of the lateral bulges of the bridge. Then the pressure chambers were connected to a pressure transducer. Pressures, including peak airway pressure were recorded every five minutes following insertion. We verified the position of the ventilatory opening with respect to the laryngeal entrance by inserting a fiberoptic bronchoscope. The patients were divided into three groups : full easy view on the larynx, view on the larynx partially obstructed and view on the larynx only possible after manipulation.

We also assessed the presence of blood or secretions on the surface or in the receptacle of the device and discomfort on removal and afterwards.

### Results

|                                     | Mean | Peak     |
|-------------------------------------|------|----------|
| Paw peak (cm H <sub>2</sub> O)      | 16   | 11-28    |
| Seal pressure (cm H <sub>2</sub> O) | 19   | 12-26    |
| P heel (cm H <sub>2</sub> O)        | 33.1 | 3.9-81.3 |
| P toe (cm H <sub>2</sub> O)         | 28.4 | 7.2-58   |
| P bridge (cm H <sub>2</sub> O)      | 9.4  | 0-49.7   |

The device was easy to insert. Two patients complained of sore throat. In two other cases the bronchoscopy didn't give a full easy view on the larynx, not related with a more difficult insertion or any anatomical peculiarities. In five patients there was leakage as the peak airway pressure exceeded the sealing pressure. We have not noticed gastric material nor blood on removal.

### Discussion

The mucosal pressures seem to be related to the relative size of the SLIPA. The mucosal pressures the SLIPA induces, increase with the size. If you assess the thyroid cartilage to be between two sizes, you better choose the smaller size. The measured pressures are less but it may result in a lower maximum 'leak' pressure.

### Conclusion

The SLIPA has been shown to be a possible alternative to the LMA. Considering our data we consider it easy to use and effective for ventilation. Choosing the correct size is important because there is no cuff to compensate for size discrepancies.



Fig. 1. — SLIPA (Streamlined LIner of the Pharynx Airway)

### References

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*Lumbar transforaminal epidural steroid injections : a prospective short-term outcome study.* G. DE CLERCK, T. THYSSEN, A. KUMAR, P. VAN WAMBEKE, J. MOONEN, B. MORLION. Leuven Algologisch Centrum, UZ Leuven, Herestraat 49, 3000 Leuven.

### Introduction

Sciatica is a common cause of pain and disability. Intervertebral disc herniations are the most frequent cause of lumbosacral radiculopathy, and 10 to 15% of these patients eventually require surgery. Overall, the vast majority of patients with lumbosacral radiculopathy recover with conservative care which includes oral analgesics and physical therapy. Transforaminal epidural steroid injections (TFESIs) are used as an adjunct in the treatment and are now a common therapeutic procedure (2). The lumbar TFESI technique using fluoroscopic control allows a high concentration of corticosteroid to be delivered precisely to the ventral aspect of the lumbar nerve root sleeve and the dorsal aspect of the disc herniation. Our objective was to assess short-term outcome after treatment with lumbar TFESI in our centre.

### Methods

The prospective study was conducted at the Leuven Algology Centre from October 2005 to January 2006. The 39 patients included had clinically diagnosed unilateral sciatica, confirmed by electrodiagnostic findings and/or radiographic findings including MRI. All patients were referred for TFESI. Only patients with a pre-intervention Visual Analogue Scale (VAS) of 4 or more (moderate and severe pain) were considered for this study. Duration of symptoms before treatment was variable and patients were allowed to continue oral analgesic medication use. The TFESI was carried out at the level corresponding to the lesion observed on the imaging study. After injection of 1mL of contrast medium to produce a neurogram that identified the nerve root in question, a mixture of 1 mL Diprophos® (betamethasone sodium phosphate 2,63 mg and betamethasone dipropionate 6,43 mg) and 2 mL lidocaine 1% was injected. Treatment outcome was measured by scoring a VAS with a range of options from 0 (no pain) to 10 (severe pain) and an Oswestry Disability Index (ODI) ranging from 0 (no disability) to 100% (bedridden). Outcome measures were collected before TFESI and at 3 and 6 weeks after TFESI. The data collected were analyzed with JMP 6. To compare data to baseline paired *t*-test, Wilcoxon signed ranks tests and multivariate analysis were used according to appropriateness.

### Results

Thirty-nine patients, mean age 55,1 years (SD 15,35) and 55% female were analyzed. The VAS (baseline ; mean 6,1 ; SD 1,49) was significantly decreased after the intervention at 3 weeks (mean 4,55 ; SD 2,40 ;  $P < 0,001$ ) and at 6 weeks (mean 4,1 ; SD 2,43 ;  $P < 0,001$ ) (Fig. 1). The ODI (baseline ; mean 44,4 ; SD 17,00) was significantly decreased after the intervention at 3 weeks (mean 35,4 ; SD 20,24 ;  $P < 0,001$ ) and at 6 weeks (mean 32,2 ; SD 18,05 ;  $P < 0,001$ ) (Fig. 2). Correlation analysis revealed a good correlation of ODI and VAS at the different measurements ( $R = 0,55$  ;  $0,68$  and  $0,58$  respectively). Age does not correlate with VAS, but correlates well with baseline ODI ( $R = 0,56$ ) (Table 1). No complications such as dural puncture, headache, bleeding, nerve damage or infection occurred.

### Discussion

A decrease of pain intensity by 34%, as observed in our study, is considered as clinically relevant and comparable to the data in the literature (3). The well-established good correlation between ODI and VAS scores is also reflected in our results. Review of the literature reveals that TFESIs appear to be efficacious in the treatment of radicular pain particularly when caused by an acute inflammatory process without irreversible changes in neural structure and with duration of symptoms less than 1 year (2). Factors associated with a decreased success of TFESI include preexisting spondylolisthesis in addition to disc herniation and duration of symptoms exceeding 1 year (1). Review of medical records of patients included in our study suggests an advantageous effect of TFESI in cases of acute isolated disc herniation. No patients with symptom duration exceeding more than 1 year were included in our study.

One drawback of this study is the small patient population. Other limitations are the variation in patient population, pain aetiology, concomitant treatment, duration of symptoms before infiltration and lack of a control group. Furthermore, it is known that oral analgesics offer substantial pain relief in patients with sciatica and natural

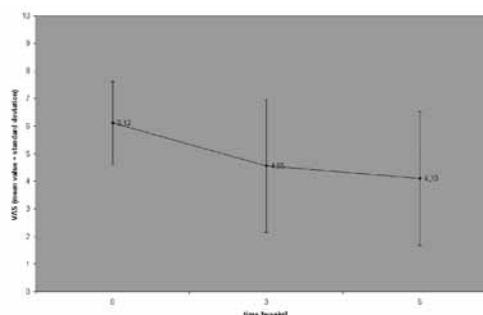


Fig. 1. — VAS

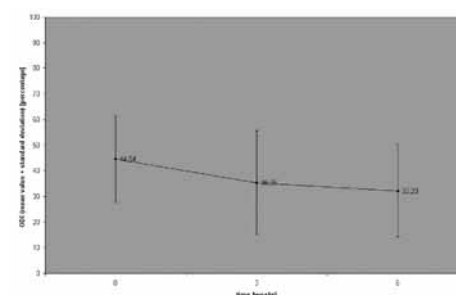


Fig. 2. — ODI

Table 1

Correlation analysis

|         | ODI pre | ODI 3 w | ODI 6w | VAS pre | VAS 3 w | VAS 6 w | Age     |
|---------|---------|---------|--------|---------|---------|---------|---------|
| ODI pre | 1,0000  | 0,7540  | 0,6783 | 0,5456  | 0,2348  | 0,0650  | 0,5627  |
| ODI 3 w | 0,7540  | 1,0000  | 0,9116 | 0,5216  | 0,6810  | 0,5046  | 0,3440  |
| ODI 6w  | 0,6783  | 0,9116  | 1,0000 | 0,4660  | 0,5958  | 0,5824  | 0,3499  |
| VAS pre | 0,5456  | 0,5216  | 0,4660 | 1,0000  | 0,2852  | 0,1278  | 0,1882  |
| VAS 3 w | 0,2348  | 0,6810  | 0,5958 | 0,2852  | 1,0000  | 0,8208  | -0,0095 |
| VAS 6 w | 0,0650  | 0,5046  | 0,5824 | 0,1278  | 0,8208  | 1,0000  | -0,0513 |
| Age     | 0,5627  | 0,3440  | 0,3499 | 0,1882  | -0,0095 | -0,0513 | 1,0000  |

history of disease suggests a high chance of resolution of symptoms without intervention (3). Additionally, epidural infiltrations may be associated with a significant placebo effect (1).

### Conclusion

TFESIs are a valuable tool for early and effective pain control in acute lumbosacral radiculopathy. Further prospective randomized controlled trials with subgroup analyses are required to determine factors predicting outcome and the best indications for performing lumbar TFESIs. Especially the duration of complaints could be a determinant of the response to injection.

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*Patient-controlled epidural analgesia after Caesarean section : bupivacaine 0.0375% versus levobupivacaine 0.075% both combined with sufentanil.* B. DE WULF, M. VAN DE VELDE, E. VANDERMEERSCH. Department of Anaesthesiology, UZ Leuven, Belgium.

### Introduction

Levobupivacaine, the *s*-enantiomer of bupivacaine is believed to have less toxic side-effects (1). Several minimal local anaesthetic concentration studies suggested that it was slightly less potent than bupivacaine (2, 3, 4). The primary purpose of the present trial was to compare the analgesic efficacy and incidence of side-effects between our standard mixture for patient controlled epidural analgesia (PCEA) after Caesarean section and a mixture containing levobupivacaine.

### Methods

Following ethics committee approval and written patient informed consent, 40 ASA 1 and 2 patients scheduled for Caesarean section were included in this double-blinded prospective randomised trial. Women with severe perioperative complications were excluded. Other exclusion-criteria were : ASA 3 and 4, refusal and contra-indication to epidural puncture. All patients received PCEA for post-Caesarean section analgesia with the pump set at a continuous infusion of 10 ml/h with boli of 2 ml with a lockout-time of 20 min. The first

group received bupivacaine 0.0325% with sufentanil 1 µg/ml (B-group), the second group levobupivacaine 0.075% with sufentanil 1 µg/ml (L-group). Demographic and obstetric data were recorded. The primary outcome variables studied were the quality of analgesia and incidence of motor blockade. Secondary endpoints were incidence of other side-effects and total volume of local anaesthetic used. Patients were evaluated at the end of surgery and after 1, 3, 6, 12, 24 and 48 hour. Statistical analysis consisted of repeated measures ANOVA with post hoc testing whenever appropriate. Categorical data were analysed using Chi square analysis and Fisher exact test. A  $p < 0.05$  was considered statistically significant.

### Results

No differences in demographic and baseline obstetric data could be detected between the groups. No differences in pain intensity and pain relief could be observed. The two groups had similar haemodynamic reactions. Motor blockade was similar in the two groups. Local anaesthetic consumption was higher in the L-group.

|                | B-group     | L-group        |                  | B-group | L-group |
|----------------|-------------|----------------|------------------|---------|---------|
| LA consumption | 64.4 ± 34.2 | 127.4 ± 59.0 * | MB end of CS (n) | 17      | 16      |
| VAS end of CS  | 0 ± 0       | 2 ± 4          | MB 1 hour (n)    | 13      | 8       |
| VAS 1 hour     | 2 ± 6       | 5 ± 13         | MB 3 hour (n)    | 5       | 5       |
| VAS 3 hour     | 10 ± 17     | 17 ± 17        | MB 6 hour (n)    | 1       | 1       |
| VAS 6 hour     | 20 ± 19     | 16 ± 19        | MB 12 hour (n)   | 2       | 1       |
| VAS 12 hour    | 20 ± 25     | 18 ± 16        | MB 24 hour (n)   | 1       | 1       |
| VAS 24 hour    | 25 ± 21     | 16 ± 20        | MB 48 hour (n)   | 0       | 0       |
| VAS 48 hour    | 19 ± 22     | 13 ± 15        |                  |         |         |

LA consumption : total local anaesthetic consumption after 24 hours (mg). CS : Caesarean section.

\*  $p < 0.05$  versus B-group. VAS : Visual analogue scale for pain. MB : number of patients with motor block.

### Discussion

We did not found any differences between the two concentrations for analgesic efficacy and motor blockade.

### Conclusion

The results of the present trial suggest that levobupivacaine 0.075% with sufentanil is equally effective and safe to produce post-Caesarean section analgesia as compared to bupivacaine 0.0325% combined with

sufentanil. A larger trial is needed in the future to confirm these results.

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*Popliteal block for forefoot surgery : does clonidine prolong the analgetic effect of ropivacaine ?*

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*Introduction*

Popliteal block is considered an effective anesthesia technique for forefoot surgery. Recent evidence suggests that adding clonidine (1 µg/kg) to a local anesthetic improves postoperative analgesia without significant side-effects (1). Clonidine might also prevent Tourniquet pain possibly at the expense of more sedation (2). When added to an axillary block these effects have been found to be dose-dependent. The purpose of this trial is to investigate whether the duration of analgesia is increased by adding clonidine to a popliteal block.

*Methods*

Following ethical committee approval and written patient informed consent, 30 ASA I, II and III patients were included in this double-blind, randomized trial. All patients received a popliteal block using ropivacaine 150 mg in 30 ml. In the R-group, 15 patients received only ropivacaine. In the R+C-group clonidine (75 µg) was added. The primary outcome variable studied was the duration of analgesia. VAS-score, blood pressure, heart rate and sedation level were followed every 30 minutes for two hours and every hour for a further four hours. Demographic data were recorded. Statistical analysis consisted of repeated measures ANOVA with post hoc testing whenever appropriate. Categorical data were analysed using Chi square analysis and Fisher exact test. A  $p < 0.05$  was considered statistically significant.

*Results*

No differences in demographic and baseline data could be identified between the two groups. Analgesia was prolonged when clonidine was added to the anal-

gesic mixture. More patients experienced hypotension in the R+C-group.

|                                    | R-group   | R + C-group |
|------------------------------------|-----------|-------------|
| Duration effective analgesia (min) | 358 ± 118 | 463 ± 117*  |
| Patients with SBP < 20% (n)        | 1         | 8*          |
| Patients with HR < 20% (n)         | 0         | 4           |
| Sedated patients (n)               | 9         | 4           |

\*  $p < 0.05$  versus R-group.

*Discussion*

Clonidine has a significant effect on duration of effective analgesia and on blood pressure. With this trial we could not distinguish whether this is a local or a systemic effect. We would expect that clonidine causes more sedation, but this trial could not prove a significant difference. This could be due to the lack of statistical power or the different types of sedation and premedication used.

*Conclusion*

The results of the present trial indicate that clonidine prolongs effective postoperative analgesia when added to ropivacaine during popliteal block. More patients experience hypotension. Further studies are needed to investigate the effect on sedation levels when clonidine is used during popliteal block.

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2. Gentili, *et al.*, ANEST. ANALG., **88** (6), 1327-30, 1999 Jun.

### Introduction

The monitoring of the neuromuscular block eliminates the risk of post-operative residual curarization (1). Using acceleromyography (AMG) requires thumb free mobility, which is frequently obstructed during the surgical procedure. This study investigates the clinical use of a new hand protective device called TOF-tube (2).

### Materials and methods

The TOF-tube is a rigid and tubular device. It allows stability of both the wrist and the hand, while ensuring total thumb mobility under the surgical sheets (fig 1) and improving the quality of AMG measurements (3).

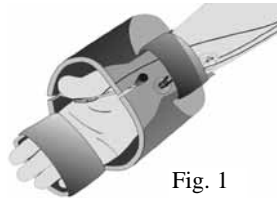


Fig. 1

Four questions were to be answered by eight anaesthetists after their first few clinical uses of the TOF-tube on 80 consenting patients undergoing various types of surgery in supine position (94%) with their arms either alongside the body (77%) or on an arm board (23%).

### Results and discussions

| Questions  | Positive answers |
|--|------------------|
| 1/ TOF-tube is easy to set up  | 90%              |
| 2/ Stability during operation  | 95%              |
| 3/ You believed in the measurements  | 97%              |
| 4/ You used them to adapt the depth of blockade or to ensure full recovery | 99%              |

The patients never complained after use (no compression or skin injury).

The most frequent comment concerned the cumbersome nature of the device and its difficult installation when dealing with corpulent patients especially in gynaecological position.

All anaesthetists were convinced of the usefulness of the TOF-tube to insure the quality of AMG monitoring during surgery, in quite every patient and installation.

### Conclusion

The TOF-tube optimises the monitoring of neuromuscular function by acceleromyography in daily clinical practice.

Some adaptations in the design of the device will occur taking all comments into account.

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*Success of in vitro fertilization (IVF) following propofol/remifentanil sedation or clorazepam/piritramide sedation: a retrospective study.* C. HENDRICKX, S. DE BROCK\*, T. D'HOOGHE\*, E. VANDERMEERSCH, M. VAN DE VELDE. Departments of Anaesthesiology and \*Obstetrics and Gynaecology, UZLeuven, Belgium.

### Introduction

Anaesthetic management for oocyte retrieval may interfere with the results and success rate of in vitro fertilization (IVF) (1, 2, 3). This retrospective study was conducted to compare the effects of two different anaesthetic techniques, used for oocyte retrieval, on IVF success.

### Methods

Following institutional approval, we performed a retrospective chart analysis of all women undergoing oocyte retrieval as part of an IVF program between January 1<sup>st</sup> 2003 and December 31<sup>th</sup> 2004. Data were analysed according to the anaesthetic technique used for sedation during oocyte retrieval. In the PR-group, patients were sedated using IV propofol (target controlled infusion set at 1-2 µg/ml) and remifentanil at an infusion rate of 0.1 µg/kg/min. In the CD-group, patients received 20 mg clorazepam orally and 0.2-0.3 mg/kg piritramide IM 30 minutes prior to the procedure. In both

groups postoperative analgesia consisted of oral paracetamol 1000 mg. Demographic data, number of oocytes aspirated, number of mature oocytes aspirated, number of embryos transferred, number of biochemical pregnancies (positive HCG), number of clinical pregnancies (fetal sac) and pregnancy follow-up data were recorded. Data were analysed using appropriate parametric and non-parametric tests.  $P < 0.05$  is considered to be statistically significant.

### Results

A total of 926 patients were included: 416 patients received propofol and remifentanil and 510 patients received clorazepam and piritramide. No differences in demographic data could be identified between the groups. Significantly more oocytes were aspirated and fertilized in the patients treated with propofol and remifentanil. However this did not result in more transferred embryos, more biochemical pregnancies or clinical pregnancies (Table).

|   | PR-group (n = 416) | CD-group (n = 510) |
|---|--------------------|--------------------|
| Number of aspirated oocytes                   | 5015               | 4546               |
| Number of mature oocytes aspirated            | 4152               | 3765               |
| Number of fertilized oocytes                  | 2621               | 2487*              |
| Number of embryos transferred                 | 570                | 697                |
| % of mature oocytes per aspirated oocytes     | 83                 | 83                 |
| % of fertilized oocytes per aspirated oocytes | 52                 | 55                 |
| % of fertilized oocytes per mature oocytes    | 63                 | 66                 |
| % of biochemical pregnancies                  | 31                 | 33                 |
| % of clinical pregnancies                     | 26                 | 28                 |

\*  $p < 0.05$  versus PR-group.

### Discussion

Based on these retrospective data, propofol and remifentanil used for sedation during oocyte retrieval has not an inferior success rate of IVF treatment compared to clorazepam and piritramide sedation.

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*First epileptic seizure induced by occupational nickel poisoning.* C. KUMBA, D. DEBELS, R. DENAYS, D. LISON, Ph. VAN DER LINDEN. CHU Brugmann, ULB, Departments of Anaesthesia and Intensive care, 4, Place Van Gehuchten, B 1020 Brussels Belgium.

### Introduction

Toxic causes of seizures are numerous : alcohol and drugs of abuse, medications, industrial and household products [1]. In some cases, identification of the toxic origin of new-onset seizures may be difficult.

### Case reports

We present two case reports. The first patient was a 34-year-old man admitted to our hospital for coma and respiratory distress. Medical and surgical history was unremarkable. He was found unconscious and dyspnoeic at his workplace, a car body repair workshop where he was cleaning ceilings. The patient was intubated on scene. Routine blood analyses, blood and urine drug screening, serologies, lumbar puncture, cerebral CT and MRI scans were normal. The patient was extubated on day three. He was found to be aphasic (global aphasia). EEG showed continuous periodic left temporal epileptiform discharges. Non-convulsive focal status epilepticus was suspected : 5 mg diazepam and 1250 mg phenytoin were administered intravenously. The patient totally recovered and was discharged a few days later without a clear etiology for his focal epilepsy.

A week later, the second patient, a 43-year-old man was admitted to our intensive care unit from the same workplace, doing the same work. He presented inaugural generalized tonic-clonic seizures. He had no medical or surgical history. Brain CT and MRI scans were normal. Blood routine analyses were normal. Blood prolactin and lactate levels were high 36.8 ng/ml (normal values : 2.5-11) and 122.8 mg/dl (normal values : 9-16) respectively. EEG performed a few hours later showed diffuse slow waves. Seeing this second case, toxicological advice was sought. Standard blood and urine toxicological analyses were not contributive but urine analysis brought out a high nickel concentration 18.7 mcg/g creatinine (normal value : < 2).

### Discussion

Acute nickel poisoning occurs after inhalation of great amounts of nickel, most often in the form of nickel carbonyl (Ni(CO)<sub>4</sub>), more rarely in the form of Ni, Ni<sub>3</sub>S<sub>2</sub>, NiO or Ni<sub>2</sub>O<sub>3</sub>. Most acute nickel carbonyl poisoning occur in industrial environments, most often after pipe leaks or accidental discharges. At room temperature, nickel carbonyl is extremely volatile and toxic, with lungs, gastro-intestinal tract and brain being susceptible targets (2, 3). The initial effects involve irritation of the respiratory tract and non-specific symptoms (headache, dizziness, epigastric pain, nausea and vomiting). Patients with severe poisoning develop intense pulmonary and gastrointestinal toxicity. Diffuse interstitial pneumonitis and cerebral oedema are the main causes of death. Convulsions occur occasionally.

### Conclusion

We present two cases : one patient with respiratory distress, coma and de novo status epilepticus and another patient with inaugural generalized tonic-clonic convulsions. These cases underline the importance to keep in mind the possibility of toxic induced seizures in a patient with new onset convulsions of unknown etiology.

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*Impact of the co-morbid conditions on the morbidity and mortality in cervicofacial cancer surgery.*

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*Introduction*

Cervicofacial cancer surgery is considered to be at high risk, due to the duration of surgery and to the frequent poor health status of the patients. With the aim of setting a rational basis for improving the protocols of patient peri-surgical care and identifying higher-risk patients, we reviewed the data obtained in our institution relative to morbidity and mortality.

*Material and methods*

Retrospective study including 99 consenting patients (72 men, mean age 59 years) with head or neck cancer submitted to extensive surgery : 50 transmandibular buccopharyngectomy (TMBP), 25 crico-hyodoepiglottopexy (CHEP) and 24 total laryngectomy (TL). The mean time of surgery was respectively 10,1 hours for TMBP, 4,9 for CHEP and 8 for TL. Ninety one patients were classified as ASA II, 7 as ASA III and 1 as ASA IV. *Study end-points* : Both surgical and medical complications recorded in the peri-surgical period were correlated with a) the type of surgery b) some patient characteristics : ASA class and co-morbidity factors (ie cardiovascular risk level, addictions, denutrition, previous pathologies).

*Results*

Sixty nine patients (69%) presented at least one surgical or medical complication. The main complications were infections (39%), difficulties for oral feeding with deterioration of the health status (26%) and surgical complications : flap necrosis, fistulae and haematomas (25%). Postoperative pneumonia was the most common medical complication. The different micro-organisms isolated in our serie were gram negative bacilli. There was a higher incidence of medical complications occurring in TMBP, whereas surgical complications were more frequent in CHEP. Mortality during hospitalization occurred in 22%. The main causes were infections (36%), health status worsening (36%) and haemorrhage (18%). Mortality was comparable in the three types of surgery. Multivariate statistical analysis showed a significant relationship between perioperative mortality and preoperative comorbidity level, as indicated by ASA status (Odd Ratio (OR) ASA III vs ASA II 5,4). We found relationships between mortality and daily alcohol and/or tobacco consumption (OR 2,4), between mortality and weight loss (OR 2,4) and between mortality and chronic obstructive pulmonary disease (COPD) (OR 2). In the cases with a weight loss exceeding 10%, the rate of complications was 69% and mortality reached 35%. Our study didn't show any influence of surgery duration and blood transfusion on prognosis.

|                                       | ASA III | Alcohol and/or smoking | COPD  | Patients with weight loss | Overall |
|---------------------------------------|---------|------------------------|-------|---------------------------|---------|
| Morbidity (at least one complication) | 71,4%   | 69,5%                  | 70%   | 69,2%                     | 69%     |
| Mortality rate                        | 57.1%   | 24,4%                  | 26,7% | 34,6%                     | 22%     |

*Discussion*

Our data show that cervicofacial cancer surgery is still associated with high morbidity and mortality. Medical complications and comorbidity are involved in the majority of these cases. Perisurgical weight loss appears as the major modifiable risk factor and should therefore be addressed more aggressively.

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*The Leeds Assessment of Neuropathic Symptoms and Signs Pain Scale (LANSS) does not discriminate radiculopathy as neuropathic pain in patients scheduled for transforaminal epidural infiltration.* T. THYSSEN, G. DE CLERCK, P. VAN WAMBEKE, S. CARDOEN, J. MOONEN, A. KUMAR, B. MORLION. Leuven Algologisch Centrum, UZ Leuven, Herestraat 49, 3000 Leuven.

### Introduction

Spinal radicular pain, the so called sciatica, is the most common neuropathic pain syndrome, with a prevalence of 4,5% in individuals older than the age of 30. Neuropathic pain is defined by the international Association for the Study of Pain in 1997 as "pain initiated or caused by a primary lesion or dysfunction in the nervous system". The lesion in most spinal (lumbar and cervical) radiculopathies is a focal compressive and inflammatory injury of the nerve root and dorsal root ganglion. The Leeds Assessment of Neuropathic Symptoms and Signs (LANSS) Pain Scale attempts to estimate the probability that neuropathic mechanisms contribute to the chronic pain experience in a given patient (1). Our objective was to assess the LANSS Pain Scale in patients suffering from unilateral cervical or lumbar radiculopathy, referred to our pain centre for transforaminal epidural steroid infiltrations (TFESIs), and to evaluate possible correlations with pain intensity and level of disability.

### Methods

Patients listed for TFESI at the Leuven Algology Centre from October 2005 to January 2006 were assessed. Approval of the Ethical Committee was not needed. The 78 participants included had clinically diagnosed unilateral lumbar or cervical sciatica, confirmed by electro diagnostic findings and/or radiographic findings including MRI. Duration of symptoms before treatment was variable between 6 weeks and 12 months. All patients had received treatment with oral analgesics and were assessed by a physiotherapist. We assessed the LANSS Pain Scale, Oswestry Disability Index (ODI) and a Visual Analogue Scale (VAS) for pain intensity. The data collected were analyzed with JMP (version 6). To compare data to baseline paired *t*-test, Wilcoxon signed ranks tests and multivariate analysis were used according to appropriateness.

### Results

Seventy eight patients, mean age of 53,7 years (13,58 SD) and 52% female, participated. Twenty five patients (32%) had LANSS scores of 12 and more. 71% patients suffered from lumbar radiculopathy, 29% suffered from cervical radiculopathy. Multivariate correla-

tion analysis reveals no correlation between LANSS (mean 8,9 ; SD 4,97) and ODI (mean 38,4 ; SD 15,83 ; R = 0,18) or VAS scores (mean 5,2 ; SD 1,87 ; R = 0,16). The ODI correlated significantly with the VAS scores (R = 0,60). Age did not correlate with any of the variables. Subgroup analysis of patients with LANSS scores of 12 or more (high probability of neuropathic pain mechanism) and localization of the radiculopathy revealed the same results.

### Discussion

Only 32% of patients with the clinical diagnosis of radiculopathy had LANSS scores of 12 or more. This questions the validity of the diagnosis of radiculopathy, the proposed mechanism of radicular pain and the value of the LANSS pain scale. Most patients were suffering moderate to severe pain. However, pain intensity did not correlate with the probability of a neuropathic mechanism according to the LANSS score. The contribution of neuropathic pain to radiculopathy is not fully understood. Pain symptoms, signs, mechanisms, and syndromes, until recently, were classified into 2 broad mechanism-based pain categories : nociceptive and neuropathic. Recently, this dichotomous approach has been questioned and a model of chronic pain being 'more or less neuropathic' has been suggested (2).

A limitation of this study is the small patient population (n = 78). Duration of symptoms is variable and not always more than 3 months. Therefore, is it possible that some of our patients did not yet develop symptoms as hyperalgesia and allodynia which are the positive signs of neuropathy. Some of them only present with hypesthesia and numbness, the negative signs of neuropathy. These negative symptoms are more discriminating variables in a new neuropathic pain diagnostic questionnaire (DN 4), introduced in the Dutch language version only after the start of our study (3).

### Conclusion

Clinical radiculopathy, confirmed by electro diagnostic findings and/or radiographic findings including MRI, is not discriminated as neuropathic pain by the LANSS Pain Questionnaire. Other neuropathic pain scales must be evaluated in this specific setting to discriminate radiculopathy as neuropathic pain.

|       | ODI    | VAS    | LANSS  | Age    |
|-------|--------|--------|--------|--------|
| ODI   | 1,0000 | 0,5975 | 0,1791 | 0,4085 |
| VAS   | 0,5975 | 1,0000 | 0,1614 | 0,1814 |
| LANSS | 0,1791 | 0,1614 | 1,0000 | 0,0266 |
| Age   | 0,4085 | 0,1814 | 0,0266 | 1,0000 |

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*Changes in high volume low pressure endotracheal tube cuff and paratracheal pressures during shoulder arthroscopy.* C. VANDENBOSSCHE, M.D., J. DEWOLF, M.D., E. VAN GERVEN, M.D., P. DEBEER, M.D., Ph. D, E. VANDERMEERSCH, M.D., Ph.D. University hospital Gasthuisberg, Leuven, Belgium.

### Introduction

Even though very rare, fatal airway obstruction caused by extravasation of fluid into the surrounding soft tissue, does occur during shoulder arthroscopy (1, 2). Recent research demonstrated soft tissue pressures in the paratracheal region to reach peak values up to 133 mmHg (3). We speculate that increased tissue pressures in the paratracheal region may be transmitted to the cuff of the endotracheal tube.

### Methods

After approval of the ethics committee, we performed a prospective study in 42 patients and a control group of 25 patients undergoing other orthopaedic procedures. A written informed consent was obtained for all. All patients had general anesthesia with endotracheal intubation. No nitrous oxide was used. Arthroscopy patients were installed in the lateral decubitus position. The cuff was connected to a pressure transducer and 'zeroed' at 20 cm H<sub>2</sub>O. In the arthroscopy group we then inserted a 22G needle medial to the sternocleidomastoid muscle 2 cm above the incisura jugularis. The needle was connected to a pressure transducer zeroed at the level of insertion. Pressures were recorded every

3 minutes until 10 minutes after fluid irrigation was stopped. Quantity of fluid used was measured. To determine significance of changes in cuff pressure a T-test was performed. To determine variables who could influence the changes in cuff pressures paratracheal pressure, age, weight, duration of the procedure, quantity of fluid used for joint distension, linear regression was performed.

### Results

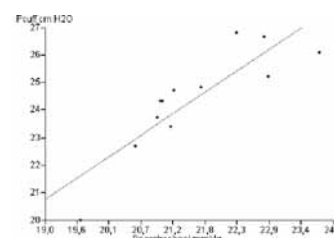
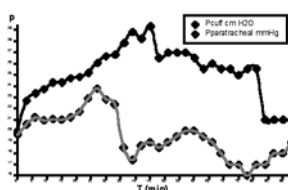
**Cuff pressure:** Mean peak cuff pressure in the arthroscopy group was 26.5 cm H<sub>2</sub>O (SD 4.08 cm H<sub>2</sub>O, range 21-35 cm H<sub>2</sub>O) compared to 20.80 cm H<sub>2</sub>O (SD 1.63 cm H<sub>2</sub>O, range 20-24 cm H<sub>2</sub>O) in the control group ( $p < 0.01$ ). **Paratracheal pressure:** mean paratracheal peak pressure was 21.07 mmHg (SD 6.68 mmHg, range 11-60 mmHg). The mean change in peak paratracheal pressure was 4.79 mmHg (SD 6.68 mmHg, range 0-40 mmHg).

Both pressures did not recover to baseline at 10 minutes after fluid irrigation was stopped.

Statistical analysis could determine significant changes in cuff pressure and correlation between changes in paratracheal pressure and changes in cuff pressure ( $R^2 = 0,8047$ ).

Table 1  
Results (cmH<sub>2</sub>O)

|                               | Arthroscopy | Control group |
|-------------------------------|-------------|---------------|
| Mean Pcuff peak               | 26.5        | 20.8          |
| Standard deviation Pcuff peak | 4.08        | 1.63          |
| Range Pcuff peak              | 21-35       | 20-24         |
| Mean Pcuff                    | 6.73        | 0.80          |



### Discussion

We were able to prove that, in our series, the cuff pressures did rise significantly during shoulder arthroscopy and did not recover to baseline ten minutes after surgery. We can also confirm the rise in paratracheal pressures, although we didn't have patients in our series with such high pressures as previously reported (3). A significant linear correlation between cuff pressure and paratracheal pressures is proven in our series.

### Conclusion

Shoulder arthroscopy causes elevation of cuff and paratracheal pressures. The changes in cuff and paratracheal pressures show correlation. We therefore feel we can conclude that cuff pressures can be used to

evaluate paratracheal pressures. We feel we can endorse the conclusion to advocate endotracheal intubation in shoulder arthroscopy (3).

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*Modulation of Thermosensation by cutaneous small fibers and nociceptors following repeated application of Lidocaine 5% patches.* K. VAN MALDEGHEM, M.D., G. HANS, M.D., M. VERCAUTEREN, M.D., Ph.D. Antwerp University Hospital, Dept. of Anaesthesiology and Pain Treatment, Wilrijkstraat 10, 2650 Edegem, Belgium.

### Introduction

Lidocaine patches 5% were recently introduced as a new treatment option for the management of postherpetic neuralgia (PHN). Results of controlled clinical trials have demonstrated the efficacy of the lidocaine patch in patients suffering from PHN (3). There is however also a growing rationale for the use of the lidocaine patches in the management of patients with other neuropathic pain conditions. Smaller-scale studies have indeed shown the efficacy of this new transdermal treatment option in patients with other (complex) neuropathic pain states (1, 2). Despite this growing clinical evidence, very little is known regarding the effects of application of these lidocaine patches on the sensory afferents in the treated skin areas.

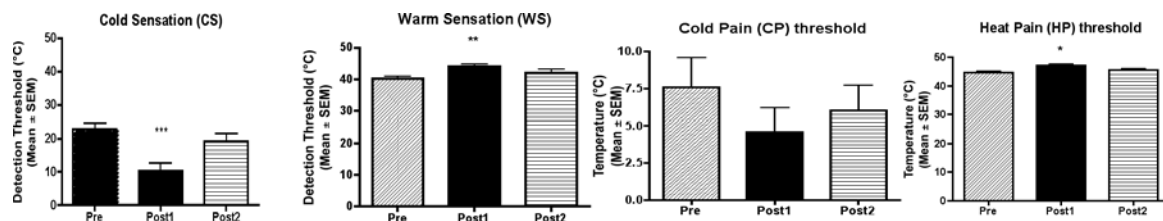
### Methods

After approval of the local ethical committee and written informed consent, we investigated the effects of repeated application of lidocaine 5% patches on thermosensation in human volunteers (n = 20). Patches were applied on three consecutive days on a cervical (C6) and a lumbar dermatome (L5) on the dominant body site, respecting a 12 h on/off schedule. Before the first application, quantitative thermal sensory testing (QST) was performed in all subjects. QST consisted of a sequential measurement of detection thresholds for cold sensation (CS), warm sensation (WS), cold pain (CP), heat pain (HP) and heat pain tolerance (HPT). QST was per-

formed on the region where patches were applied. The morning following the third application volunteers were subjected to the second QST session, scheduled to initiate shortly after removal of the third (and last) patch. A final sensory testing session was performed exactly twelve hours later (12 hr patch free period), hereby investigating the duration of effect of the patch. Data were analysed using the method of analysis of variance for each sensation (ANOVA), after which post-hoc testing (Dunn's multiple comparison test) was performed when significant overall differences were found (making pair-wise comparisons between groups).

### Results

Repeated application of lidocaine patches at the lumbar dermatome led to significant elevations of detection thresholds of all investigated thermal sensations. Indeed, during the second testing session volunteers displayed significantly reduction of all (non-painful and painful) thermal sensations. Interestingly enough, observed detection thresholds returned almost to pre-application levels during the third testing session. In the cervical dermatome almost identical results were obtained. However, in contrast to the findings in the lumbar region, detection thresholds for cold pain (CP) showed here no significant increase after transdermal lidocaine treatment. Once again, obtained thresholds after 12 hr of non-application did not differ from their pre-application values.



### Discussion

Repeated application of lidocaine 5% patches leads to a significant hypo-aesthesia for non-painful as well as painful thermal sensations. These results clearly indicate a significant effect of transdermal lidocaine on the function of cutaneous small afferent fibers. The fact that these effects do not last for 12 hours in our testing protocol is probably due to the relative short duration of treatment (3 days). These results of this study provide the first indication of the alteration of cutaneous small fiber functionality by repeated application of lidocaine 5% patches.

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