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Low versus high concentration of lesobupivacaine for postoperative epidural analgesia : influence of mode of delivery. P. BADIBANGA, F. BARDIAU, J. BOOGAERTS, M. DERNEDDE. University Hospital Centre, Charleroi, Belgium.

Background

While the use of continuous epidural infusion (CEI) or patient-controlled epidural analgesia (PCEA) has become common place in postoperative pain management, there is still controversy regarding the relative effects of the mass, volume and concentration of local anesthetic solution. This prospective study evaluates the influence of the mode of delivery on the quality of analgesia produced by a same dose of levobupivacaine (LB) at high or low concentration after lower abdominal surgery.

Materials and Methods

After Ethical Committee approval and informed consent, 82 patients undergoing abdominal surgery were included. An epidural catheter was inserted at a low thoracic level before induction of general anesthesia. In the postoperative period, patients were divided into 4 groups : CEI 0.5% LB 3 ml/h (n = 21) ; CEI 0.15% LB 10 ml/h (n = 20) ; PCEA 0.15% LB as a 3.3-ml bolus on demand, with a lockout interval of 20 min (n = 21) or PCEA 0.5% LB as a 1-ml bolus on demand, with simi-

lar lockout interval (n = 20). No background infusion was used in the PCEA groups. Motor blockade (Bromage score), upper sensory level, pain scores at rest (summarised as pain indicators), haemodynamics, LB used per and postoperatively, subcutaneous rescue morphine consumption, side-effects, and patient satisfaction (4-point scale) were recorded for the first 48 h. General Linear Model (GLM) statistics and Student's *t* test with Bonferroni correction were used. *P* < 0.05 significant.

Results

The four groups were similar regarding demographic data, morphine consumption, side effects and patient satisfaction. A better pain relief was observed in patients receiving the CEI (*P* = 0.002) but LB consumption was higher (*P* < 0.001). Bromage scores were 0 in PCEA and inferior to 1 in CEI groups (*P* = 0.40). Blood pressure was slightly lower in the 0.15% CEI group compared with the 0.15% PCEA group, as demonstrated by GLM analysis (*P* = 0.036). No vasoconstrictor was given to any patient.

Table 1

Pain indicators, postoperative analgesic consumption and patient satisfaction in the four groups

Variable	0.15% CEI (n = 20)	0.15% PCEA (n = 2)	0.50% CEI (n = 21)	0.50% PCEA (n = 20)	<i>P</i> -value
AUC (cm ²)	239 ± 22.6	56.0 ± 2.6	29.6 ± 30.6	54.0 ± 28.7	0.002
VAS max (cm)	2.38 ± 1.34	4.26 ± 2.40	2.62 ± 1.95	3.90 ± 1.86	0.005
VAS mean (cm)	(0.53 ± 0.50)	1.24 ± 1.09	0.63 ± 0.64	1.31 ± 0.76	0.002
PVAS > 3 (b)	1.21 ± 3.61	5.95 ± 10.4	1.57 ± 3.36	4.26 ± 4.82	0.05
LB (mg)	360 ± 0.0	66.3 ± 62.2	360.0 ± 0.0	72.4 ± 71.4	< 0.001
Morphine (mg)	110 ± 108	119 ± 15.7	13.9 ± 12.1	10.1 ± 10.6	0.41
Propacetamol (g)	16 ± 0	16 ± 0	16 ± 0	14 ± 0	-
NSAIDs (n)	20 (100%)	17 (81%)	18 (86%)	15 (75%)	0.14
Anti-emetic (n)	4 (20%)	5 (24%)	2 (9%)	7 (35%)	0.27
Satisfaction (score)	3.58 ± 0.61	3.35 ± 0.93	3.60 ± 0.63	3.44 ± 0.78	0.79

AUC : area under the visual analogue scale (VAS) time curve, PVAS > 3 : persistence of VAS over 3 cm.

Discussion

Thoracic CEI using LB provides better postoperative pain relief when compared with PCEA. The total amount of LB used is higher in the continuous administration groups (1). These results strengthen previous studies statements that neither volume, nor concentration of the local anaesthetic are determinant factors for quality

of analgesia (2, 3). The total anaesthetic amount is the key factor.

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Long term use of oral methadone in non-cancer patients with severe pain. Wim G. BRUYNEEL, Steven M. BRABANT, Werner J. NAGELS, Dirk DE KEGEL, Patrick H. DOBBELS. Dept. of Anesthesiology and Pain Management, H.-Hartziekenhuis, Westlaan 123, 8800 Roeselare, Belgium.

Aim

Methadone is a synthetic opioid that has some unique characteristics such as no known active metabolites which are responsible for CNS toxicity, practically no urinary excretion, a long and unpredictable half-life, an excellent absorption after oral and rectal administration, and an extremely low cost. Methadone is used as a first line drug for opioid rotation in the setting of palliative cancer pain management (1, 2, 3). Almost no data exist about the use of methadone in non-cancer pain. In this study we evaluated the long-term effectiveness of oral methadone as an alternative treatment in patients with severe non-cancer pain.

Methods

Patients with severe non-cancer pain requiring strong opioids and with a history of or actual clinical relevant opioid related neurological (ORN) side-effects were included on an intention to treat basis. After obtaining oral informed consent following data were recorded: type of pain, pain score (VRS 0 → 10), clinical ORN side-effects and daily dose of methadone. Treatment was started using 0.03mg/kg/8h and previous treatment was immediately discontinued. Data were recorded at 6 months (time 1) and 12 months (time 2) after starting methadone and were retrospectively analysed.

Results

Eleven patients (mean age 55 ± 14 y) were included with pain originating from Buerger disease (n = 1), peripheral nerve lesion (n = 2), failed back surgery syndrome (n = 6), degenerative spinal disease (n = 1) and frozen shoulder (n = 1). Previous to the methadone therapy 5 patients were treated with tramadol, 3 with transdermal fentanyl, 2 with morphine and 1 received intramuscular methadone injections.

The median therapy time was 10 ± 6 months. One patient stopped the methadone after only one month due

to severe headache, another two dropped out due to lack of effect. Eight patients continued the treatment and showed a better pain relief. The reported side-effects were fatigue (n = 2) and nausea (n = 1). Of these eight patients, 6 evaluated the treatment as good or very good and 2 as moderate.

Table 1

Indication to initiate methadone therapy

	Number
Persistent pain	5/11
Nausea	2/11
Itching	1/11
Hallucinations	1/11
Headache	2/11

Table 2

	Time 0	Time 1	Time 2
Number of patients	11	9	8
Pain score (VRS)	7.2 (6.5)	4 (2.8)	3 (2.25)
Daily oral dose (mg)	6 (3)	8.75 (5.1)	10 (5.37)

Data as median \pm IQR

Conclusion

Oral methadone may be a good alternative for treatment of patients with non-cancer pain having insufficient pain relief and suffering from opioid related neurological side-effects. Oral methadone provides an efficient pain relief on long term and is well supported due to its lack of major neurological side-effects.

References

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Effects of an alveolar recruitment manoeuvre on oxygenation in morbidly obese patients receiving laparoscopic gastroplasty. E. DE GROEF, M. LAUWERS, F. CAMU. Department of Anesthesiology, VUB Medical Center, Laarbeeklaan 101, 1090 Brussels, Belgium.

Background

Morbidly obese patients are characterized by alterations in their respiratory mechanics and gas exchange. This prospective randomized trial in morbidly obese patients undergoing gastric banding tested whether the alveolar recruitment manoeuvre (ARM) followed by PEEP was more effective than PEEP only to prevent atelectasis, to improve respiratory mechanics and oxygenation.

Methods

The study protocol was approved by the Committee of Medical Ethics. After informed consent twenty patients were randomly assigned to receive ARM-PEEP or PEEP only. After intubation the control group was ventilated with standardized mechanical ventilation settings including a PEEP of 8 cm H₂O. The ARM group was manually ventilated to an airway pressure of 40 cm H₂O for 10 breaths over one minute, followed by the same standardized mechanical ventilation settings. Hemodynamics, ventilation parameters and arterial blood gas analysis were measured pre-induction (T0), 5 (T1) and 20 (T2) minutes post-induction but before insufflation, 20 minutes after insufflation (T3), after surgery (T4) and 20 minutes after arrival in the recovery room (T5). Data were compared with Mann Whitney test. $P < 0.05$ was considered as statistically significant.

Results

Demographic data were similar. No adverse effects were reported. No statistical differences were observed with respect to hemodynamics, except for the diastolic and mean arterial blood pressure measured at T3, which were higher in the control group. Moreover peak airway pressure was significantly higher in the control group at T2.

Oxygenation increased after application of ARM with PEEP (ARM group $P_{aO_2} : T_0 : 80,9 \pm 6,69$ mmHg,

$P_{aO_2} T_1 : 267 \pm 82,83$ mmHg) as well as after application of PEEP alone (Control group $P_{aO_2} T_0 : 83,4 \pm 11,35$ mmHg, $P_{aO_2} T_1 : 192 \pm 63,38$ mmHg). Oxygenation remained improved during anesthesia, but P_{aO_2} levels were significantly higher in the ARM group at T₁ ($p = 0.04$) only.

Discussion

Both techniques increased the arterial oxygenation. This suggests a decrease in atelectasis and ventilation-perfusion mismatch in both groups. Only at T1 a significant higher P_{aO_2} value was obtained by the ARM technique. These results can be related to the protocol: the recruitment manoeuvre was applied only once.

Conclusion

Both techniques provided stable and adequate hemodynamics and respiratory measurements in these patients. The ARM-PEEP method failed to demonstrate any benefit at all excepted on the P_{aO_2} . The value of this finding in the clinical area, however is still to be investigated.

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Comparison of the effects of intrathecal ropivacaine, levobupivacaine, and bupivacaine for Caesarean section. T. DEMIR, P. GAUTIER, M. DE KOCK, M. IZYDORCZIC, B. VANDERICK, L. HUBERTY. Department of Anaesthesiology of Clinique St Anne – St Rémy and Department of Anaesthesiology, St Luc Hospital, Catholic University of Louvain, av. Hippocrate 10-1821, 1200 Brussels, Belgium.

Background

This study aimed to detect if intrathecal (i.t.) ropivacaine and levobupivacaine provided anaesthesia (satisfactory analgesia and muscular relaxation) and postoperative analgesia of similar quality to bupivacaine in patients undergoing Caesarean section.

Methods

The protocol was approved by the Clinical Research Practices Committee, and written informed consent was obtained from each patient. Ninety parturients were enrolled. A combined spinal-epidural technique was used.

Patients were randomly assigned to receive one of the following isobaric i.t. solutions : bupivacaine 8 mg (n = 30), levobupivacaine 8 mg (n = 30), or ropivacaine 12 mg (n = 30), all combined with sufentanil 2.5 µg. An i.t. solution was considered effective if an upper sensory level to pin-prick of T4 or above was achieved and if

intraoperative epidural supplementation was not required. Sensory changes and motor changes were recorded.

Statistical analysis

Comparison of the primary variable, namely the success rate in the different groups, was assessed by the Fisher's Exact test using subsequently the superiority approach and the non-inferiority method.

Results

Treatment groups did not differ with respect to patient characteristics. Anaesthesia was effective in 97,80, and 87% of patients in the bupivacaine 8 mg, levobupivacaine 8 mg, and ropivacaine 12 mg groups, respectively. Bupivacaine 8 mg was associated with a significantly superior success rate to that observed in the levobupivacaine group ($P < 0.05$). It also provided a longer duration of analgesia and motor block ($P < 0.05$ vs levobupivacaine and ropivacaine).

Table

Characteristics of sensory and motor blocks (means (SD), median (range))

	Bupi 8 mg (n = 30)	Levo 8 mg (n = 30)	Ropi 12 mg (n = 30)
<i>Sensory block</i>			
Time to max cephalic spread (min)	14 (9) 12 (4-45)	17 (9) 17 (6-60)	15 (9) 14 (5-45)
Time to two segment regression (min)	64 (17) 60 (30-65)	69 (14) 60 (60-107)	60 (21) 60 (35-120)
Time to regression to T10 (min)	131 (22) 122 (75-180)	124 (24) 120 (90-150)	120 (27) 120 (95-175)
Duration of analgesia (min) (first analgesic request)	157 (17) 145 (90-190) (n = 29)	136 (21)* 140 (110-270) (n = 24)	132 (22)* 135 (95-175) (n = 26)
<i>Motor block</i>			
Time to max motor block (min)	9 (6) 9 (4-30)	13 (6) 10 (5-30)	14 (6) 14 (4-30)
Duration of motor block (min)	142 (30) 135 (100-225) (n = 29)	121 (25)* 120 (75-190) (n = 24)	116 (19)* 112 (90-165) (n = 26)

(*) $P < 0,05$ when compared with the Group Bupi 8.

Conclusions

Our data support a potency hierarchy amongst the long-acting local anaesthetics. The racemic mixture of bupivacaine combined with sufentanil remains an appropriate choice when performing Caesarean sections under spinal anaesthesia.

References

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The Contribution of Parecoxib to Effective Functional Postoperative Pain Relief in Total Knee Arthroplasty. I. DERUYTTER, M. CLAEYS, V. VAN GORP, C. VANLERSBERGHE, F. CAMU. Department of Anesthesiology, VUB Medical Center, Laarbeeklaan 101, 1090 Brussels, Belgium.

Introduction

Parecoxib, a selective COX-2 enzyme inhibitor, has opioid-sparing properties in acute postoperative pain.¹ Previous studies did not evaluate the impact of this property on patient outcome after major elective surgery.^{2,3} Total knee prosthesis in elderly patients is a surgical procedure in which dynamic pain is the limiting factor for early recovery. This surgery benefits from combining causal treatment of nociception with symptomatic treatment of pain perception. This was achieved in this clinical protocol by combining Parecoxib with PCA morphine. The objective of this study was to evaluate the contribution of parecoxib to the functional recovery of the patients.

Methods

The study was realized in double blinded, randomized, placebo-controlled and prospective way. The protocol was approved by the Ethical Committee. Following written informed consent, forty six patients scheduled for elective total replacement of one knee were randomly assigned to receive either parecoxib 40 mg BID or placebo BID treatment IV for 4 days. All patients benefited from patient controlled intravenous morphine (PCA), bolus dose 1 mg/ml, lockout 6 min,

max dose 30 mg/4h. Other analgesics were withheld until after 72 hours postoperatively. Analgesic efficacy (VAS at movement), daily and cumulative morphine consumption, functional assessment of joint function and respiratory function (FEV₁, FVC), general well-being, and incidence of side effects were evaluated for 4 days postoperatively. Data were analyzed with analysis of variance for repeated measures with treatments as factors and Neuman Keuls' test for post-hoc comparisons and with Chi Square testing for discrete variables. Statistical significance was considered if $P < 0,05$.

Results

Parecoxib decreased the total amount of PCA morphine required during the first 72 h postoperatively by 23% versus placebo ($P < 0,05$, fig.2). Compared with placebo, patients who received parecoxib experienced similar intensities of postoperative pain (VAS score, fig. 1), but had significantly less opioid-related side effects (confusion, vomiting and bladder spasm) during the first 72 h postoperatively. The parecoxib group showed a better FEV₁ on the first two days ($P < 0,05$, table 1) and an improvement of knee function, patient function and maximal angle of joint flexion (fig. 3) compared with patients receiving placebo. Parecoxib use was safe and well tolerated.

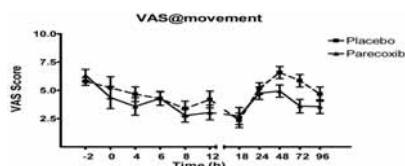


Fig. 1. — Pain VAS (day 1-4)

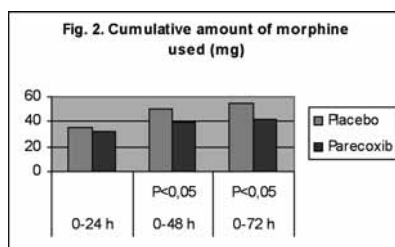


Fig. 2. — Cumulative amount of morphine used (mg).

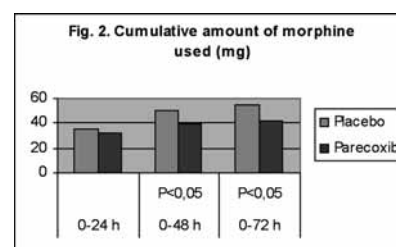


Fig. 3. — Maximal Angle of Knee Flexion (°).

Table 1
FEV₁ (L)

	Group Placebo	Group Parecoxib	P
FEV ₁			
T ₀	2,5 ± 0,8	2,0 ± 0,7	—
24h (Normalized)	78,0 ± 16,8	92,9 ± 34,9	< 0,05
48h (Normalized)	76,3 ± 16,3	98,4 ± 40,1	< 0,05
72h (Normalized)	83,9 ± 16,9	100,4 ± 41,6	n.s.

Conclusion

Administration for 4 days of IV parecoxib sodium 40 mg BID with PCA morphine improved analgesic efficacy (lesser opioid consumption), functional rehabilitation of the knee joint and respiratory function and contributed to a decreased incidence of opioid-related side effects.

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Comparative effects of a bolus of ketamine on Bispectral Index and Spectral Entropy of the EEG during sevoflurane anaesthesia. G. DETHEUX, P. Y. DEWANDRE, J. F. BRICHANT, V. BONHOMME, P. HANS. University Department of Anaesthesia & Intensive Care Medicine, CHR Citadelle, Liege University Hospital, 4000 Liège, Belgium.

Background & Goal of Study

Bispectral Index (BIS) and Spectral Entropy (E) can monitor the depth of anaesthesia. This study compared the effect of ketamine on BIS and E during sevoflurane anaesthesia¹⁻³.

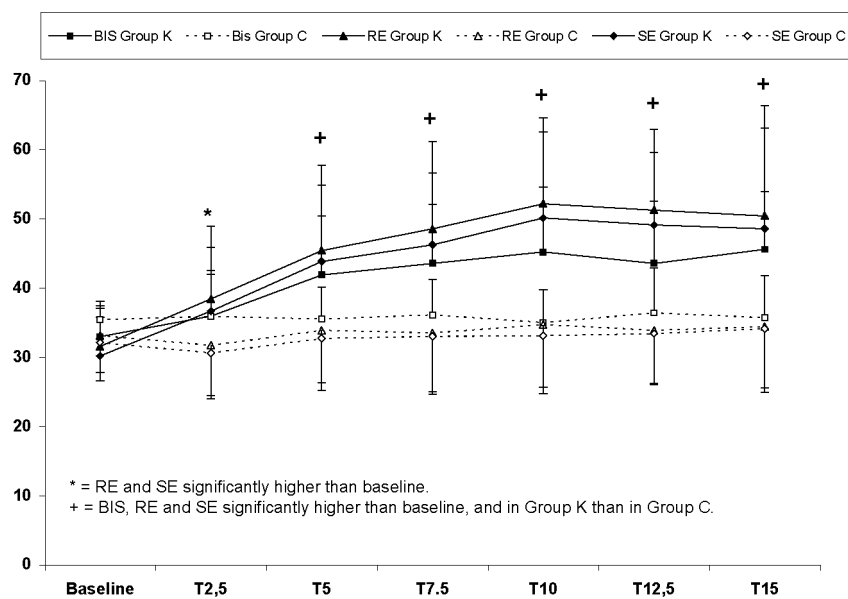
Methods

After IEC approval, 23 consenting women undergoing gynaecological surgery were enrolled in this double blind study. Anaesthesia was induced with propofol, sufentanil and rocuronium, and maintained with 1 MAC sevoflurane in air/O₂. Patients were randomly assigned to receive either ketamine 0.5 mg/kg (GK) or normal saline (NS) (GC) under stable surgical conditions. Blood pressure, heart rate, BIS, response (RE) and state (SE) entropy were recorded from 10 min. before ketamine or

NS administration (baseline) and every 2.5 min thereafter (T2.5, T5, T7.5, T10, T12.5 and T15). Data (mean \pm SD) were analysed using ANOVA's. Maximum relative increases of BIS, RE or SE (% of baseline) were compared using Bonferroni corrected Wilcoxon. $P < 0.05$ was considered statistically significant.

Results

Demographic data and ASA status were similar in both groups. Ketamine compared to NS provoked a significant increase in BIS, RE and SE respectively from T5 and T2.5 to T15. BIS, RE and SE were also significantly higher in GK than in GC from T5 to T15. The maximum relative increase of RE (42.2 \pm 10.4%) and SE (41.6 \pm 10.9%) was significantly higher than that of BIS (29.4 \pm 10.4%). Haemodynamic parameters did not change and were similar in both groups.



Conclusions

Under sevoflurane anaesthesia, ketamine causes a significant increase in RE and SE, proportionally greater than the increase in BIS. BIS, RE and SE do not appropriately reflect depth of anaesthesia during the 15 minutes after a bolus of ketamine.

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A comparison between placebo and diclofenac on surgery for hemicolectomy. M. FONTAINE, M. LAUWERS, P. DERIJCKERE, F. CAMU. Department of Anesthesiology, AZ-VUB, Laarbeeklaan 101, 1090 Brussels.

Introduction

After abdominal surgery for hemicolectomy patients get analgesia by epidural with bupivacaine 0,100% and could use morphine PCA as rescue medication. We investigated if patients could benefit from the use of diclofenac in reducing the need for morphine without side effects.

Methods

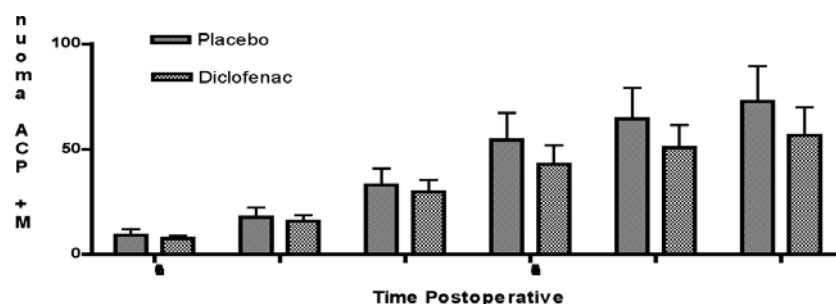
After approval from the institutional Ethics Committee and patients' informed consent, 24 ASA 1-2 patients scheduled for hemicolectomy were included in the study. All patients had similar premedication and were given an epidural catheter. Anesthesia was induced and maintained with propofol TCI together with sufentanil and cisatracurium. At the end of surgery a loading dose of 6ml bupivacaine 0,100% was administered and continuous infusion of bupivacaine 0,100% epidural was started. 12 patients received placebo IV and 12 patients received 75 mg diclofenac IV. These patients were compared, with respect to pain or adverse events, and monitored for the next 96 hours. A morphine PCA was initiated in the recovery room as rescue medication and consumption was recorded after 6, 12, 24, 48, 72, 96 hours.

Results

Statistical analysis was performed using a non-parametric test with $p < 0.05$ significant. Both groups were similar for demographic data. The cumulative rescue PCA-morphine consumption seemed to be lower in the diclofenac group compared to the placebo group (fig. below shows mean \pm SEM). However, after statistical analysis there was no statistical significant difference between both groups. Total PCA amount at $t = 96$ hours (mean \pm SD) : diclofenac 56.67 ± 46.19 versus placebo 72.58 ± 57.93 with $p = 0.1854$. Vital signs and renal function stayed within the range of normal values and were similar in both groups during the study. The mean duration till gastrointestinal recovery was similar in both groups, peristalsis appeared after three days and solid food intake was started four days after surgery. No adverse events were recorded.

Discussion

Although we would expect that patients treated with diclofenac need less morphine, our study did not show a statistical significant difference. Increasing the number of patients could lead to a different result.



Conclusion

Although there is no statistical significant difference in PCA-morphine demand between both groups, there is a trend towards a reduced morphine consumption in the diclofenac treated group.

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Impact of Test Dose on Epidural Analgesia (efficacy and mobility) in early labor. D. KAHN, F. ROELANTS, V. MERCIER, P. LAVAND'HOMME. Anesthesiology Department, St Luc Hospital, Université Catholique de Louvain, Brussels, Belgium.

Introduction

Epidural test dose (TD) with lidocaine-epinephrine is traditionally used to avoid inadvertent intravascular or intrathecal injection of analgesics. However, TD may interfere with both motor function and analgesic effect of epidural drugs (1, 2). The present study evaluates the impact of epidural lidocaine TD on epidural analgesia provided by a combination of either ropivacaine-neostigmine or sufentanil-neostigmine (also reported as "mobile technique" (3)) at the beginning of labor.

Material and Methods

After Ethical Committee approval and informed consent, at the beginning of labor, an epidural catheter was inserted at L3-L4 level in 100 healthy parturients. When VAS score (0-100) was > 30, parturients were randomly allocated to receive a TD with either lidocaine 60 mg-epinephrine 15 mg or saline-epinephrine 15 mg

in 3 mL volume, followed 3 min later by an epidural bolus of sufentanil (S) 10 mg or ropivacaine (R) 10 mg combined to the cholinesterase inhibitor neostigmine (N) 500 mg (total volume with TD = 15 mL). Pain scores (VAS) were recorded before and at 5, 15 and 30 min post-injection as well as the time elapsed until request for supplemental analgesia (mean \pm SD). Level of sensory and motor (Bromage's scale) block was assessed at 30 min (median, IQR). Evaluation of motor function also involved % patients able to stand up, bend knee, walk 3 steps and void. Maternal and fetal hemodynamic and side effects were noticed. Statistical analysis used ANOVA, X² corrected for multiple comparisons and Mann-Witney U-test. $P < 0.05$ was significant.

Results

No particular hemodynamic or side effects were observed.

Table

	TD S10N500 (n = 25)	S10 N500 (n = 25)	TD R10N500 (n = 25)	R10 N500 (n = 25)
Analgesia (min)	127 \pm 58	111.5 \pm 43	95 \pm 42	59.5 \pm 34 *
VAS initial	48 \pm 20	48 \pm 20	68 \pm 25	54 \pm 21
VAS 5 min	19 \pm 18 #	32 \pm 25	26 \pm 26 #	51 \pm 18
VAS 15 min	13 \pm 17 #	23 \pm 20	12 \pm 17 #	49 \pm 23
VAS 30 min	6 \pm 12 #	14 \pm 19 #	13 \pm 19 #	43 \pm 25
Sensory block	Th 10 (8.5-11)	Th 10 (8-10)	Th 10 (9.5-11)	Th 10 (7.5-11)
Motor block	6 (5-6)	6 (6-6)	5 (4-6) *	6 (6-6)
Stand up	68%	83% †	42%	81% †
Knee bend	56%	79% †	33%	73% †
Walk 3 steps	48%	79% †	29%	73% †
Void	61.5%	79% †	40%	64%

See Table : significant from (*) all other groups ; (#) VAS initial ; (†) TD R10N500 group.

Discussion

TD administration speeded onset and increased duration of analgesia, especially in R group. Combined to epidural R, TD strongly potentiated motor impairment. In "mobile technique", TD only affected analgesia onset without interfering with analgesia duration or ability to ambulate.

References

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Effect of Preconditioning on Oxidative Stress in an ex vivo Perfused Rat Liver. Y. KASSAR, M.D., V. NUYENS B.Sc., J. BOOGAERTS, M.D. Ph.D., M. STADLER, M.D. M.Sc. Department of Anaesthesiology, University Hospital Centre, Charleroi, Belgium.

Background

Ischaemia-reperfusion is a major cause of morbidity and mortality in liver surgery and transplantation. Brief episodes of ischaemia followed by a period of reperfusion called ischaemic preconditioning (IPC) have been shown to protect organs against subsequent sustained ischaemia (1). The goal of this experiment was to investigate the biological effect of IPC in an *ex vivo* perfused rat liver after oxidative stress.

Materials and Methods

After University Animal Care Committee approval, female Wistar rats (150-200 g), fasted for \pm 16 hours, were anaesthetised with Nembutal® I.P. The portal vein was cannulated, the liver removed and immediately perfused at a flow rate of 5 ml/min (pressure \pm 14 cm H₂O) at 37°C in a closed *in vivo* system with HBSS supplemented with insulin, HEPES and O₂. The experiment consisted of different phases : in the group 'Control' (n = 10) perfusion 15 min, warm ischaemia for 60 min, and reperfusion during 60 min ; in the IPC group (n = 6) perfusion for 2 min, IPC of 10 min, followed by 3 min reperfusion, followed by warm ischaemia and reperfusion as in the control group. Glucose and lactate (mg/dl), ALT, AST, LDH (IU/l), Reactive Oxygen Species (ROS), i.e. dienes and trienes (Oxidative Index : O.I.) were analysed in perfusate samples at different time-points. Mean \pm SD. The Bonferroni test, based on Student's *t* statistic, was used for post hoc testing. * *P* < 0.05 significant.

Results and Discussion

Results of the present experiment show a decrease in transaminases release after ischaemia reperfusion in the IPC group (Table 1). No difference was observed in the other variables. This fact indicates that IPC could improve cell survival after reperfusion injury.

Table 1

Numbers correspond to final time-point, i.e. 135 min.

Variable	Control (n = 10)	IPC group (n = 6)
Glucose (mg/dl)	84 \pm 38	98 \pm 29
Lactate (mg/dl)	3.9 \pm 3.6	3 \pm 3
AST (UI/l)	1147 \pm 721	580 \pm 356*
ALT (UI/l)	787 \pm 612	377 \pm 166*
LDH (UI/l)	8880 \pm 4545	9517 \pm 7793
Dienes (%)	42 \pm 3	39 \pm 5

Conclusion

Further studies are required to clarify whether IPC is a promising strategy in assisting preservation of the liver in clinical situations of anticipated hepatic ischaemia such as transplantation and hepatic surgery requiring repeated cross-clamping of the portal vein or hepatic vascular exclusion.

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Effects of Balanced Versus Saline-Based Solutions for Intraoperative Fluid Management in Patients undergoing Off-Pump Coronary Artery Bypass Surgery. C. KIRCH, A. DUCART, E. ENGELMAN, D. SCHMARTZ, M. DEJONCKHEERE, E. WINTERS L. BARVAIS. Department of Anesthesiology, Erasme Hospital, ULB Brussels.

Background

Sodium chloride infusions may produce metabolic acidosis, due to the presence of large amounts of chloride ions. This particular type of acidosis has also been called hyperchloremic acidosis. This could be clinically relevant because acidosis has negative effects on myocardic and renal functions. The aim of our study was to compare 2 regimens of intraoperative infusions during off-pump coronary bypass surgery (OPCAB).

Patients and methods

After ethical committee approval and written informed consent, 19 patients scheduled for OPCAB were randomized to receive either saline 0.9% and 6% HES 130/0.4 (Voluven®) diluted in saline (group NS) or Hartmann's solution and a 3% modified gelatin (Geloplasma®) (containing 100 mmol/l Cl⁻) (group BS). Volume administration and vasopressors were used at the discretion of the attending anesthesiologist. Krukall-Wallis One-Way ANOVA, Mann-Whitney-U and Chi-Square tests were used, $p < 0,05$ or $p < 0,01$ were considered significant. Values are expressed as mean \pm SD.

Results

Patients' demographic data were similar between groups. Ten patients were randomized in group NS, nine patients in group BS. No differences were seen between groups in the duration of surgery, number of coronary bypass vessels, blood losses and the amount of transfusions. In group NS, one patient died from catastrophic postoperative hemorrhage, leaving nine patients for final analysis. Group NS received significantly less colloids than group BS (1250 ± 425 vs. 1611 ± 417 ml, $p < 0.05$), and there was a trend for a lower intraoperative diuresis (1.12 ± 0.44 vs. 2.01 ± 1.47 ml/kg/h in group BS) but postoperative diuresis was higher (1.26 ± 0.47 vs. 0.77 ± 0.32 ml/kg/h in group BS, $p < 0.021$), as well as duration of mechanical ventilation (952 ± 377 vs. $678 \pm$

249 min. in group BS) and duration of ICU stay (1.7 ± 1.0 vs. 1.0 ± 0.0 days, $p < 0.038$). In group NS, significant differences were seen in pre- to post-operative base excess (BE) and serum bicarbonate (Bic) until day 1. It should be pointed out that group NS already had significantly lower levels of BE and Bic at baseline. Serum chloride levels increased transiently in group NS (112 ± 4 vs. 109 ± 3 , $p < 0.01$).

Discussion

In this randomized study of 19 patients scheduled for OPCAB surgery comparing saline with balanced solutions, we observed a transient hyperchloremia in group NS. Significant differences of base excess and bicarbonate levels remained throughout the study, without significantly affecting pH. Other clinical findings were a delayed urine output and a delayed ICU discharge because of a longer duration of mechanical ventilation. Our findings agree with other authors reporting a delayed urine output, but differ from Waters *et al.* regarding duration of mechanical ventilation, blood losses and transfusion requirements. They reported an increased transfusion requirement and no difference in the duration of mechanical ventilation in patients undergoing AAA repair and receiving saline. Once more it should be emphasized that this biochemical change is a real entity but doesn't require any therapeutic intervention.

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Continuous wound instillation after cesarean section : local analgesic effect of Diclofenac.

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Introduction

Postoperative analgesia after cesarean section (CS) is commonly afforded by systemic administration of opioids and NSAIDs (1). Regional analgesic technique involving wound irrigation with local anesthetic is also effective (2). Although surgical injury locally releases inflammatory mediators (e.g. prostaglandins) which sensitize peripheral nociceptors and produce pain and hyperalgesia, results from wound infiltration with NSAIDs are inconclusive (3). The study evaluates the local analgesic effect of diclofenac (DICLO) after elective CS.

Methods

After informed consent, healthy parturients undergoing elective CS under spinal anesthesia were randomly allocated to 3 groups (n = 20 per group) to receive after surgery a subcutaneous continuous infusion (elastometric pump : 5 mL/h during 48 h, Painbuster, I-Flow, Lake Forest, USA) with either DICLO 300 mg/48 h, ropivacaine 0.2% (ROPI) or saline (SAL). ROPI and SAL groups also received IV DICLO 75mg every 12 h. All patients were connected to a PCA device with IV morphine for 48 h. Pain scores (VAS 0-10) evaluated wound pain at rest (R) and movement (M) and pain from uterine contractions (C) at 12, 24 and 48 h after surgery. Area of hyperalgesia was measured at 24 and 48 h with von Frey filaments and residual wound pain at 1 and 6 months was questioned. Side effects like blood losses and wound healing were closely recorded. Statistical analysis used ANOVA and X^2 for multiple groups.

Results

Patients did not differ concerning demographic data. No side effect resulted from local or systemic

administration of DICLO. R and C VAS, area and % patients with hyperalgesia were similar between the groups. Results in Table are mean \pm SD ; (*) $P < 0.05$ was significant from SAL.

	SAL	ROPI	DICLO
M VAS at 12 h	7 \pm 1.9	3 \pm 2.9 *	5 \pm 1.9
M VAS at 24 h	6 \pm 2.8	5 \pm 2.2	4 \pm 1.6 *
M VAS at 48 h	4 \pm 2.6	3 \pm 1.4	2 \pm 2.0 *
PCA morphine (mg)	32 \pm 19	19 \pm 12 *	14 \pm 10 *
Pain at 1 month	40%	33%	5% *
Pain at 6 months	22%	5.5%	0% *

Discussion

Wound infiltration with DICLO is equivalent to ROPI and more effective than systemic DICLO to relieve acute pain and to produce better morphine sparing effect after CS. At 1 and 6 months, less residual pain is present after local DICLO analgesia.

References

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Does Hemodilution on Bypass affect Outcome after CABG ? M. MOMENT⁺, A. MATTA⁺, M. T. RENNOTTE⁺, M. VANDYCK⁺, C. WATREMEZ⁺, L. JAQUET^{*}, P. NOIRHOMME^o, P. BAELE⁺. Dept of Anesthesia⁺, Intensive Care^{*} and Cardiac Surgery^o. Anesthesia dept, St. Luc University Hospital (UCL), Avenue Hippocrate, 1200 Brussels.

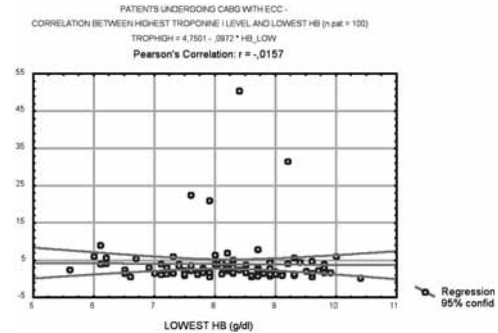
Background

At least two large multi-centre studies conducted between 1996 and 1998 have correlated increased mortality after Coronary Artery Bypass Grafting (CABG) with low hematocrit (Hct) during bypass (1, 2). The underlying mechanism is thought to involve myocardial damage, because non-survivors died from low cardiac output syndrome starting as soon as weaning from bypass, even in patients with good preoperative heart function (3). The next logical step would be to investigate the influence of Hct on relevant biological markers. A recent work disclosed an exponential increase of Troponin I (TnI) levels as Hct decreases, starting at Hct as high as 29% (4). If such a mechanism was confirmed, one should determine whether it is anemia per se or its treatment (transfusion) which provokes myocardial damage (5).

Our center prospectively gathers a Continuous Quality Assurance data base concerning transfusion in elective CABG surgery. Every second year 50 to 150 consecutive cases are studied, unknown to the involved clinicians. This work reviews the series spanning the same years as the above studies, to confirm/ infirm their findings.

Methods

Our data set includes postoperative length of stay, days spent in intensive care, mortality, and biological markers such as lowest Hct during hospital stay (usually during bypass, if used) and TnI. The six 1996-2002 series also follow major technical changes made in CABG surgery : '96 warm cardioplegia (n = 59) vs. '96 cold cardioplegia (n = 60), '98, 2000, and 2002 with bypass (n = 100) vs. 2002 off bypass (n = 60). Pearson's correlation



coefficients between TnI and lowest Hct (or haemoglobin levels) were calculated for each series, before and after removing outliers, i.e. patients whose TnI values exceeded their series mean by more than 2 SD.

Results

We found no correlation whatsoever between TnI and lowest Hct in any group of patients. All series had a nearly perfect horizontal relationship between TnI and lowest Hct, spanning Hct values from 16% to 44%. A graphical example is provided in the above figure. Pearson coefficients (r) and slopes are listed in the table. To reach even borderline significance the absolute values of r should exceed 0.3. In all series the outliers were spread evenly across the Hct range. Lowest Hct of non-survivors were : 17, 20, 23, 24, 24 & 30, vs. an average of 25.9 (+3.67) for survivors. Cardiac morbidity, such as postoperative atrial fibrillation, or the need for assistance with an intra-aortic balloon pump or any other device, was totally independent of lowest Hct.

Correlation coefficients (r =) (Slopes)	1996 ColdCardioplegia n = 60	1996 WarmCardioplegia n = 59	1998 WarmCplegia n = 125	2000 WarmCplegia n = 100	2002 Warm, on bypass n = 100	2002 Off bypass n = 60
Complete group	-0.1862 (-1.518)	-0.0451 (-0.581)	-0.0314 (-0.046)	-0.0732 (-0.026)	-0.0157 (-0.097)	-0.1084 (-1.311)
Without outliers	-0.1158 (-0.503)	0.1017 (+0.397)	-0.1284 (-0.043)	-0.0575 (-0.007)	-0.1965 (-0.335)	0.01209 (+0.029)

Discussion

Our results do not confirm the hypothesis that myocardial damage resulting from hemodilution could explain the increased mortality observed in previous studies, and we specifically fail to reproduce Burtin's correlation between postoperative TnI and intraoperative lowest Hct (4). Our Hct ranges were similar to referenced studies (1, 2, 4). There are many possible reasons why the outcome of our patients is not influenced by hemodilution, e.g. : non-diluting myocardial protection techniques, more complete myocardial revascularization, doubling of suspected insufficient conduits with an extra saphenous vein if abnormal ST segments occur at reperfusion, exclusive use of leu-

cocyte-filtered packed red cells when transfusion is needed. The total size of our combined series may not be large enough to exclude an effect of hemodilution on mortality, but it definitely fails to support a progressive relation between Hct and a specific and sensitive marker of myocardial damage like TnI.

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Remifentanyl for fetal immobilization and maternal sedation during fetoscopic surgery : a randomized, double blind comparison with diazepam. G. NOTELÉ, D. VAN SCHOUBROECK*, L. LEWI*, J. DEPREST*, M. VAN DE VELDE. Department of Anesthesiology and *Obstetrics and Gynecology, UZ Gasthuisberg Leuven.

Introduction

Obstetrical endoscopy procedures are performed to treat selected complications of monochorionic twin gestation (1). These procedures are performed under combined spinal epidural anesthesia (CSE) as a means of maternal anesthesia but CSE provides neither fetal immobilization nor anesthesia. Fetal movements may lead to fetal trauma and may hamper surgery. Initially, IV diazepam (DZP) was used to ascertain fetal immobilization but these effects were often unpredictable and disappointing. We previously evaluated remifentanyl (REMI) as sedative agent during obstetric endoscopic surgery (2). Thus we initiated a randomized, double blind trial comparing the effects of IV DZP versus IV REMI in pregnant women undergoing obstetric endoscopic surgery.

Methodology

Following institutional Ethics Committee approval, 54 ASA I and II women in the second trimester of a multiple pregnancy, scheduled for fetoscopic surgery, consented to this study. All patients underwent CSE anes-

thesia and following baseline recordings, maternal IV sedation was started using either incremental doses of diazepam (up to 10 mg) or a continuous infusion of remifentanyl (0.1 mcg/kg/min). Maternal demographic data, previous medical history, relevant obstetrical data, maternal sedation, hemodynamics, side-effects as well as fetal hemodynamics and immobilization were evaluated prior, during and for 60 minutes after surgery. Two way repeated measures ANOVA followed by appropriate post hoc testing was performed. Categorical data were analyzed using chi-square analysis and Fisher exact test.

Results

No significant differences in demographic and obstetrical data were observed. REMI produced adequate maternal sedation with mild, but clinically irrelevant respiratory depression (Fig. 1). DZP resulted in a more pronounced maternal sedation but no respiratory depression. As compared to DZP, fetal immobilization with REMI occurred faster, was more reliable and was more pronounced, resulting in better surgical conditions (Fig. 2).

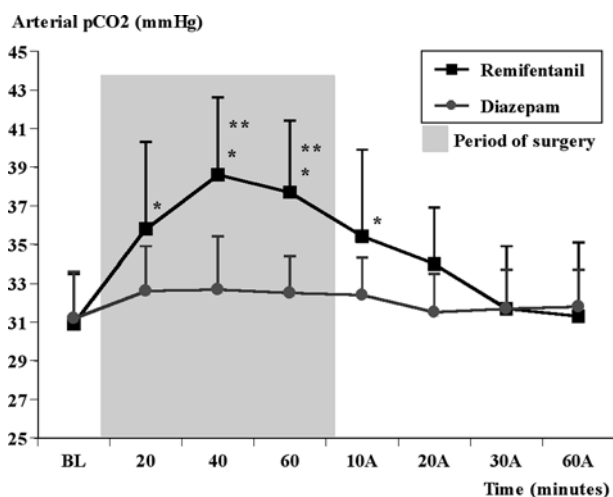


Fig. 1. — Arterial pCO₂

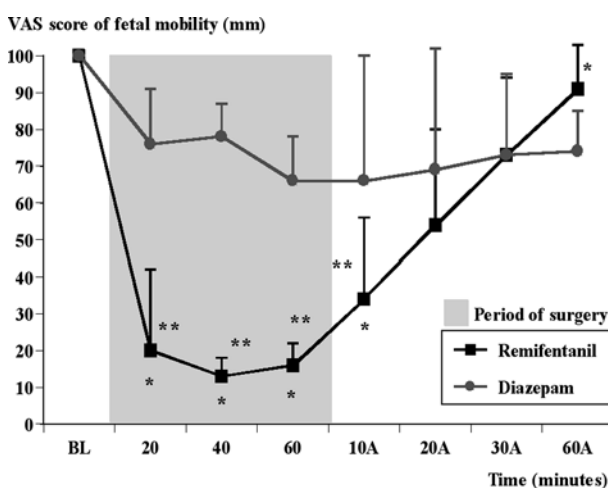


Fig. 2. — VAS score for fetal mobility (100 = Extremely mobile and 0 = immobile).

Discussion

From these results we conclude that REMI is a safe and superior alternative to maternal DZP to induce maternal sedation and fetal immobilization during fetoscopic surgery in second trimester pregnant women.

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Sevoflurane for aortic valve replacement (AVR) surgery. V. PEPERMANS, S. CROMHEECKE, R. MEEUS, S. DE HERT. Department of Anesthesiology, University Hospital Antwerp.

Introduction

Several studies have shown that, compared to a total intravenous anesthetic regimen, the use of a volatile anesthetic regimen during coronary surgery was associated with a better early postoperative recovery of myocardial function and a lower postoperative release of troponin I (TnI) (1, 2). The present study investigated whether this phenomenon could also be observed after AVR surgery.

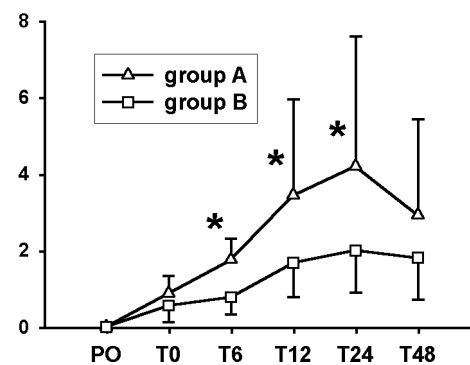
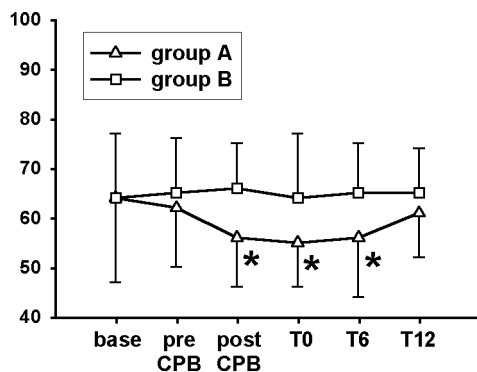
Methods

Following the approval by the Institutional Ethical Committee, and written informed consent, thirty patients undergoing AVR surgery were randomly assigned to receive either a target-controlled infusion of 2-4 µg/ml propofol (group A) or an inhalational anesthetic regimen with 0,5-2% sevoflurane (group B). Except for this, anesthetic and surgical management was

the same in all patients. Blood samples for the assessment of TnI concentrations were taken prior to surgery (P0) at arrival on the ICU (T0) and at 6, 12, 24, and 48 hours after T0. Hemodynamic data were recorded under paced heart rate at 90 beats/min throughout the observation period. Data were compared using analysis of variance for repeated measurements. Interaction analysis revealed whether effects were different between groups. Statistical significance was accepted at $p < 0.05$.

Results

Both groups were comparable for pre- and intraoperative variables. TnI values and stroke volumes are shown in Figures 1 and 2. Stroke volume remained preserved in group B but showed a transient decrease in group A from post CPB until T12. The transient increase in postoperative TnI values was higher in group A from T6 to T24.



Data are mean \pm standard deviation ; CPB = cardiopulmonary bypass ; * = $p < 0.05$ between groups.

Conclusion

The results of the present study suggest that in patients undergoing AVR surgery, the use of a volatile anesthetic regimen was associated with a better early postoperative myocardial function and a lower release of TnI.

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Prevalence of pain at home after day care surgery. F. A. RAPS, J. M. DE RIJKE, M. VAN KLEEF, M. A. E. MARCUS. Vrije Universiteit Brussel, Academisch Ziekenhuis Maastricht.

Introduction

Improved surgical techniques and the introduction of new anesthetic drugs allowed a rapid expansion of one-day surgery worldwide. However, this increase in one-day surgery cases was associated with little attention given to residual pain patients experience at home. We assessed the prevalence and intensity of postoperative pain for the first 4 days following surgery.

Methods

From October 2002 till February 2003, 650 patients who underwent a surgical procedure at the day care unit of the University Hospital Maastricht, were included. Exclusion criteria were: age < 18 years, emergency surgery and communication problems.

Table 1

Distribution of patients according to the surgical departments

Surgical department	Number of patients	%
General surgery	199	30,6
Orthopaedics	168	25,8
Ophthalmology	95	14,6
Plastic surgery	62	9,5
Gynaecology	60	9,2
ENT	36	5,5
Urology	20	3,1
Maxillo-Facial surgery	10	1,5

Patients treated according our current postoperative pain protocol (including paracetamol, NSAID's, mild opioid) were asked to rate their pain by filling in Visual Analogue Scales (VAS) before, one and two hours after surgery. Additionally, a diary was given to the patients where they were asked to note their pain-score three times a day for the first four consecutive days to surgery.

Results

Data analysis was performed with SPSS/PC software (frequency tables, means). The patients were 19-89 years old, the male/female ratio was 44/56. Sixty one % of the patients underwent GA and 39% received RA.

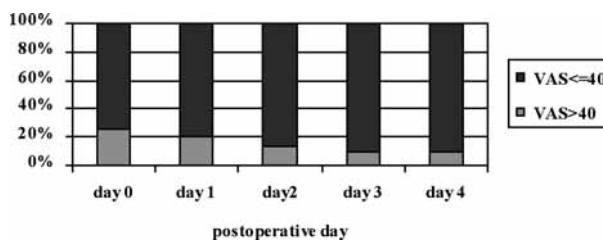


Fig. 1. — Postoperative pain after day-care surgery (VAS <= 40 no or mild pain/ VAS > 40 moderate to severe pain).

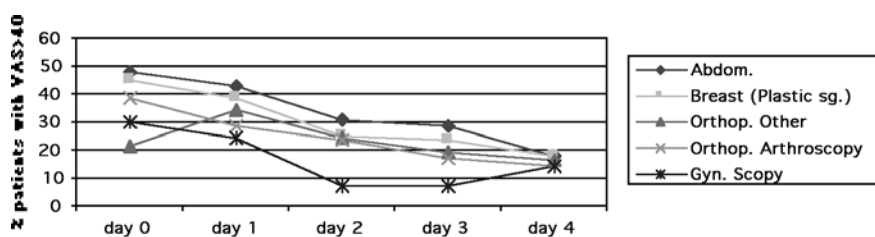


Fig. 2. — Top 5 of most painful surgical procedures up to day 4.

Conclusion

Although our results show that pain intensity is progressively decreasing, some surgical procedures

cause moderate to severe pain until four days after surgery.

Benefits of intravenous lidocaine in an acute rehabilitation program after laparoscopic colectomy.

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Background and goals

The concept of postoperative acute rehabilitation was introduced by Kehlet's group as a mean to accelerate recovery after open and laparoscopic colectomy (1, 2). Intravenous (iv) lidocaine during surgery decreases postoperative pain and speeds the return of bowel function (3). This study investigated the effects of intravenous lidocaine in an acute rehabilitation protocol for patients undergoing laparoscopic colectomy.

Material and methods

After approval of our institution Ethics Committee, 30 patients scheduled for laparoscopic colectomy gave their consent to be included in this randomised double-blind placebo-controlled study. Patients were allocated in two groups : iv lidocaine (bolus = 1.5 mg/kg, intraoperative infusion 2/mg/kg/h, then postoperative infusion of 1.33 mg/kg/h for 24 h) or saline. Anaesthesia (sevoflurane in O₂/air [FiO₂ = 80%]) and postoperative analgesia (paracetamol, ketorolac and PCA piritramide [a synthetic opioid]) were standardised. Patients were allowed to drink 6 h postoperative and to eat a normal breakfast the day after surgery. Postoperative iv infusion was stopped 24 h after surgery if per os intake was well tolerated. Enforced mobilisation and ambulation were requested from the patients. Our goal was to discharge patients 3 days after surgery or sooner. Postoperative pain at rest, during mobilisation and coughing for 48 h, postoperative piritramide consumption during 24 h, return to bowel function (first fla-

tus and time to defecation) and hospital stay were recorded. Data (means \pm SD) were analysed using ANOVA or Students' *t* test.

Results

Demographic data were similar in the two groups. Lidocaine significantly reduced piritramide consumption (15 ± 15 mg vs 40 ± 40 mg, $P = 0.02$), postoperative pain at movement ($P = 0.02$) and coughing ($P = 0.03$). Lidocaine significantly reduced postoperative ileus and shortened hospital stay (Table).

	Flatus (h)	Defecation (h)	Hospital stay (d)
Placebo (n = 15)	30 \pm 12	48 \pm 19	3.8 \pm 1.9
Lidocaine (n = 15)	20 \pm 9*	32 \pm 13*	2.8 \pm 0.6*

* : $P < 0.05$

Conclusions

Intra- and postoperative iv infusion of lidocaine reduces postoperative pain, opioide consumption and ileus. Intravenous lidocaine facilitates postoperative rehabilitation protocol and allows for a one day reduction in hospital stay.

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Diabetes mellitus does not increase the current intensity required for motor response during nerve localization. Catherine VANDEPITTE, M.D., R. CLAUDIO, B.S., S. SHAH, M.D., A. SANTOS, M.D., M.P.H., A. HADZIC, M.D., Ph.D. Department of Anesthesiology, St. Luke's-Roosevelt Hospital New York and University Hospital Gasthuisberg, Leuven, Belgium.

Introduction

For successful nerve block, local anesthetics should be deposited in the immediate vicinity of the nerve to be anesthetized. Nerve stimulation using an electrical current of 0.2-0.5 mA is a widely accepted technique for localization of the nerve. Recent reports suggested that patients with diabetes mellitus (DM) may require a current of greater intensity or of longer duration to obtain a motor response (1, 2). We investigated therefore in this study, whether patients with DM but without clinically overt neuropathy necessitated an altered current intensity for electrical nerve stimulation. We hypothesized that these patients require similar current intensity to localize nerves as healthy patients.

Methods

After Institutional Review Board approval, information on *minimal* current required to obtain visual response to nerve stimulation during interscalene, infraclavicular, sciatic and femoral block was recorded in 120 patients with diabetes mellitus (DM) and 120 healthy matched controls undergoing upper and lower extremity surgery with nerve blocks. The data also included demographics, coexisting diseases, success rate, number of attempts to localize the nerve, and specific motor response to nerve stimulation. Data were acquired from our institutional computerized record-keeping system, and analyzed using Student *t* test and μ^2 test where appropriate with SPSS (Statistical Package for the Social Sciences for Windows, version 5.0.2, Chicago, IL, 1999). A *p* value of ≤ 0.05 was considered to be significant.

Results

There was no significant difference in the minimal current required for a visible motor response in patients with DM versus HEALTHY patients (0.41 ± 0.08 mA and 0.39 ± 0.1 mA, respectively ; Figure 1).

Conclusion

Our data suggest that the current intensity required to elicit a visible motor response to nerve stimulation

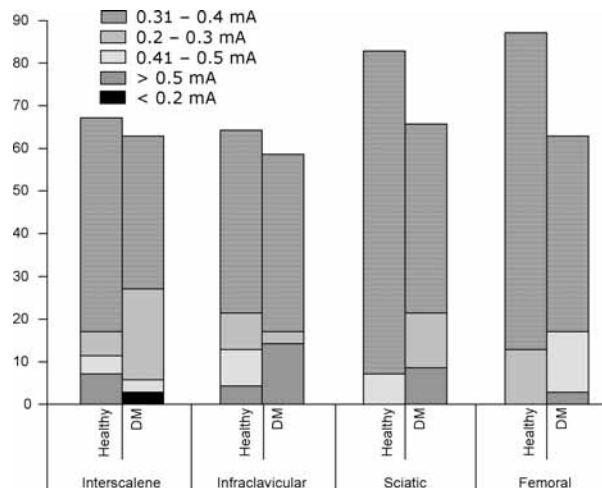


Fig. 1. — Minimal intensity of the stimulating current during interscalene, infraclavicular, sciatic and femoral nerve blocks for healthy and diabetic patients.

Legend : % indicates the percentage of patients in whom the nerves could be stimulated with the specified current ranges.

adequate for interscalene, infraclavicular, sciatic and femoral block in patients with DM (but no overt neuropathy) is similar to that seen in healthy patients. Future studies are necessary to determine current intensity required to elicit motor response with more peripheral techniques (e.g., popliteal block) and in patients with neuropathy.

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The use of a bedside coagulation analyser for determination of the Prothrombine Time (PT) on patients with oral anticoagulation undergoing cardiopulmonary bypass surgery. T. VANHOUTTE, R. DEMEYERE, E. VANDERMEERSCH. Department of Anesthesia, University Hospitals Katholieke Universiteit Leuven, Herestraat 49, B-3000 Leuven, Belgium.

Introduction

Monitoring of coagulation during major surgical procedures is important for further patient management. Point-of-care control can fasten those clinical decisions. CoaguChek® Pro is a recently developed near-patient coagulation analyser that gives results within a few minutes, which is faster than the time needed for Core Laboratory-data (in our institute averaging more than 45 minutes).

Materials and methods

Data for this study were taken from a study that compared fresh frozen plasma (FFP) with clotting factor concentrate (PPSB®) to optimise coagulation in patients on oral anticoagulation (phenprocoumon or acenocoumarol) undergoing cardiac surgery.

After approval by the Institutes Ethical committee and patient's written informed consent, 34 patients scheduled for elective cardiac surgery (valve repair) were included in the study. All patients took their anti-coagulants until the evening before surgery. Blood

samples were drawn at seven time-points : pre-operatively (t_1), pre-incision (t_0), pre CPB and pre administration first dose FFP or PPSB (t_1), post administration (t_2), post protamin (t_6), post administration second dose FFP or PPSB (t_7), 60 minutes post CPB (t_8). PT was measured with CoaguChek® Pro and controlled by the Institutes central laboratory. Seven patients dropped out because of insufficient data. So a total of 189 paired analyses were conducted. Measurements of CoaguChek® Pro were compared with those from Core Laboratory using simple regression and paired t-test.

Results

In all of the time points combined we found a acceptable correlation coefficient ($r^2 = 0.78$ and slope of regression line 0.88). Looking at each separate time point there was a strong correlation at t_2 ($r^2 = 0.87$ and slope of regression line 1.00). At this time point the average PT was highest (PT = 57,15%). However at t_8 (post CPB, average PT = 52%) correlation was weak. At none of the other time points the correlation was as strong as at t_2 .

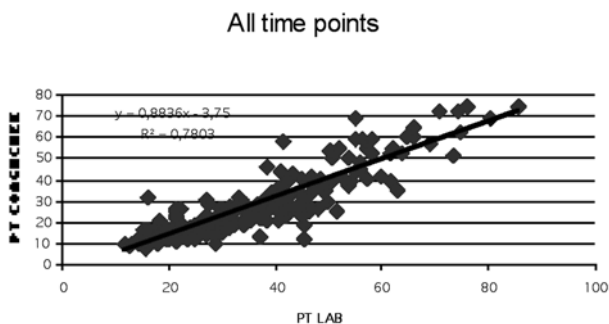


Fig. 1. — CoaguChek® Pro versus core-lab PT at all time-points.

Conclusion

CoaguChek® Pro is a valuable and time-efficient near-patient coagulation monitor. However, our results show that measurements by CoaguChek® Pro are more reliable in the higher range of PT. Less correlation is found post CPB, probably because of interfering factors

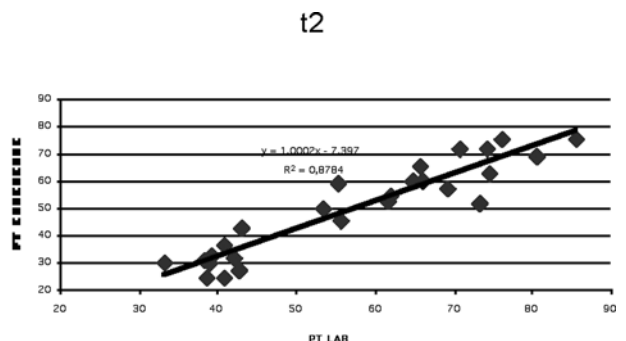


Fig. 2. — CoaguChek® Pro versus core-lab PT at time-point t_2 .

like residual heparine, protamin and dilution coagulopathy.

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Cerebral Oximetry in Patients Undergoing Carotid Endarterectomy : Preliminary Results. Philippe VETS*, Pieter TEN BROECKE*, Hugo ADRIAENSEN*, Paul VAN SCHIL**, Stefan DE HERT*. Department of Anesthesiology*, University Hospital Antwerp, Wilrijkstraat 10, 2650 Edegem, Belgium ; Department of Thoracic and Vascular Surgery**, University Hospital Antwerp, Wilrijkstraat 10, 2650 Edegem, Belgium.

Introduction

People undergoing carotid endarterectomy can develop a perioperative stroke due to cerebral hypoperfusion or embolism (1). Well documented methods of neurologic monitoring for cerebral ischemia during general anesthesia are electroencephalography (EEG) and transcranial Doppler ultrasonography (TCD) of the middle cerebral artery (MCA) (2). The purpose of this prospective study was to compare cerebral oximetry using near infrared spectrophotometry (NIRS) with EEG and TCD.

Methods

After approval of the ethical committee and informed patient consent, a prospective study was performed in 14 patients scheduled for elective carotid endarterectomy under general anesthesia. TCD of the ipsilateral MCA and four channel EEG were used as the gold standard for detecting of cerebral ischemia during carotid clamping. Severe cerebral hypoperfusion was defined as mean velocity blood flow of the MCA (V_m) less than 20% of preclamping value using TCD or a significant left-right asymmetry ($> 20\%$) in EEG derived signals. An INVOS 4100 (Somanetics, Troy, Wisconsin, USA) was used for cerebral oximetry. Regional cerebral oxygenation was expressed as rSO₂. Data of TCD and NIRS were compared using linear regression analysis.

Results

Cross-clamping of the common carotid artery resulted in a decrease of V_m of the middle cerebral artery ($-39\% \pm 40\%$) and of rSO₂ ($-6\% \pm 7\%$). No EEG asymmetry ($> 20\%$) was seen in any patient. A significant correlation was observed between the relative change of V_m and the change of rSO₂ after 1 min. of carotid clamping ($R = 0.74$; $P = 0.02$) but no correlation was observed after 3 min. ($R = 0.49$; $P = 0.18$). In 4 out of 14 patients no middle cerebral artery Doppler flow signals could be found. A stable rSO₂ signal could be easily obtained in all patients.

Table 1

Summary of cases. A carotid shunt was inserted in patients 4, 10, 11

Patient	rSO ₂ (%) preclamp	+ rSO ₂ (%) clamp + 1 min	+ rSO ₂ (%) clamp + 3 min	+TCD (%) clamp + 1 min	+TCD (%) clamp + 3 min
1	65	-2	0	No signal	No signal
2	52	3	-3	No signal	No signal
3	69	3	4	-24	-24
4	61	No data	15	No data	-70
5	69	-1	0	No signal	No signal
6	48	-8	-3	-42	-64
7	59	4	1	44	42
8	62	-9	-10	-42	-48
9	81	-11	-17	-21	-16
10	65	-17	-15	-100	-100
11	51	-5	-5	No signal	No signal
12	62	-9	-8	-60	No signal
13	77	-4	-4	-57	-36
14	70	-12	-12	-34	-40

Conclusion

Although our results were based on a small population, we didn't find a strong correlation between TCD and NIRS. This would be needed to support the use of cerebral oximetry using NIRS as a single monitor device during CEA.

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Effects of celecoxib combined to epidural analgesia on the postoperative outcome after pulmonary surgery by thoracotomy. C. WERER, M. SENARD, M. H. TRIPAR, E. FRANÇOIS, D. LIBBRECHT, L. ROEDIGER, B. HUBERT, R. LARBUISSON, M. LAMY, J. JORIS. Department of Anaesthesia and Intensive Care Medicine. CHU Sart Tilman, Liège, Belgium.

Introduction

High quality postoperative epidural analgesia can improve patient outcome (1) and may modulate the incidence of chronic post-thoracotomy pain (2). Though thoracic epidural analgesia provides excellent pain relief for thoracotomy (3), complaints of significant discomfort (shoulder pain, chest tubing...) still persist. We evaluate in this study the impact of perioperative use of oral celecoxib (specific cox2 inhibitor, added to epidural analgesia on the postoperative course after posterolateral thoracotomy : pain scores, patient satisfaction, respiratory function and initial morbidity ; and at distance from surgery : incidence of chronic pain and functional physical capacity.

Methods

After approval of our ethic committee and after informed consent, 36 patients were included in this prospective, randomized, double blind, placebo controlled study. All patients received standardized general anaesthesia associated with thoracic epidural analgesia (T4-T5) maintained for the first 48 h postop (ropivacaine 0.2% with 0.5 mg/ml sufentanil administered by PCEA). Patients received every 12 hours 200 mg of celecoxib or placebo from the evening before surgery until 48 hours postoperatively. Pain scores (Visual Analogue Scale 0-100 mm), respiratory function tests (Spirobank®) and postoperative morbidity were compared in the immediate postoperative setting. Presence, type, and intensity of pain (numeric scoring 0-10) and resuming of physical activity (Karnofsky scale) are evaluated by telephone interviews at least 6 months after

surgery. Anova for repeated measures, t test, Fischer exact test, r of Spearman have been used as appropriate, with $p < 0.05$ as significant.

Results

No difference was found in demographic data. Postoperative pain scores were significantly reduced at rest ($p = 0.026$) and cough ($p = 0.021$) in the celecoxib group (Fig. 1) and patient satisfaction was improved ($p < 0.01$). Forced vital capacity and forced expiratory flows were uniformly decreased (restrictive pulmonary syndrome) in the immediate postoperative period without significant improvement at 48 hours in both groups. No difference was observed concerning postoperative morbidity. At distance from surgery, no difference concerning incidence of chronic post-thoracotomy pain or functional physical capacity was observed between celecoxib and placebo groups (Table 1). No significant correlation was shown between immediate postoperative pain and pain at distance from surgery.

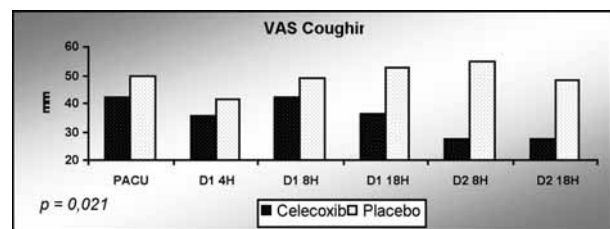


Fig. 1

Table 1

Mean value ± SD	Celecoxib	Placebo	<i>p</i>
Length of hospital stay (day)	8.4 ± 1	8.7 ± 2	0.57
Morbid postoperative events (n)	7/18	8/18	1.00
Delay for chronic pain evaluation (month)	14,5 ± 5,4	13,2 ± 5	0.52
Patients without pain (%)	41	39	0.41
Chronic Pain intensity (0-10)	2,9 ± 2	2,3 ± 1,9	0.41
Functional capacity (Karnofsky scale)	64.7 ± 33.6	59.4 ± 33.9	0.65

Conclusions

Better quality of postoperative analgesia was obtained by associating celecoxib with TEA but we could not show any difference regarding improvement of respiratory function tests or postoperative outcome. Incidence and intensity of chronic postthoracotomy pain, as well as long term functional physical capacity after thoracic surgery, were not influenced by the use of perioperative celecoxib.

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