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The use of remifentanyl during cesarean section under general anaesthesia : material and neonatal effects. F. BEERNAERT, A. TEUNKENS, E. VANDERMEERSCH, B. SPITZ, M. VAN DE VELDE. Dept. of Anaesthesiology and Dept. of Gynaecology and Obstetrics, UZ KULeuven.

Introduction

Though intravenous opioids are desirable to blunt maternal stress respons during anaesthesia for cesarean section, their use is restricted as they induce neonatal respiratory depression. Remifentanyl (R) with its rapid onset, metabolism by esterases and its constant context-sensitive half life has a high trans-placental passage. KAN *et al.* (1) demonstrated that despite a high trans-placental passage of R, R was rapidly metabolised in the neonates. Neonates were vigorous following birth and did not require respiratory support following low doses of R. Several case reports (2, 3, 4, 5) have demonstrated the benefits of R in obstetric patients. We investigated prospectively whether R administration during GA for cesarean section effectively blunted maternal stress respons and failed to induce neonatal depression in 10 patients.

Methodology

Following institutional approval, 10 patients undergoing cesarean section received a bolus dose of 0,5 µg/kg R followed by a continuous infusion of 0,2 µg/kg/min. R was combined with a target controlled infusion (TCI) of propofol of 4,0 µg/ml until loss of consciousness followed by TCI at 2,5 µg/ml. Muscle relaxation was obtained with iv succinylcholine 1,5 mg/kg. Following induction and endotracheal intubation, the

lungs were mechanically ventilated to an end-tidal CO₂ concentration of 28-30 mmHg. We recorded maternal hemodynamics, dose of R used, neonatal outcome and the occurrence of side effects.

Results

Ten patients were recruited. Of those, three had twin pregnancies. Maternal hemodynamics remained stable in 8 patients. Two patients had a transient episode of hypotension. MABP decreased in those 2 patients with 40%. In 8 patients, hypotension (> 10% decrease in mean arterial blood pressure) or hypertension (> 10% increase in mean arterial blood pressure) did not occur. Naloxone administration was not requested in any neonate. Total dose of R used was 942 ± 290 µg. Neonatal outcome was good (Table).

Discussion

GA was performed for various reasons. In one patient regional anesthesia (RA) was not possible because of previous extensive spinal surgery. In another patient RA failed because fetal distress did not allow multiple attempts. Eight patients received GA because RA was contra-indicated due to coagulation problems. Our experience suggests that in case of GA, R successfully blunts maternal stress response. R also appears to

Table

	Weight (g)	Apgar 1'	Apgar 5'	Apgar 10'	pH UA	Mask V	Duration	Intubation	pCO ₂	BE
Patient 1	1250	7	9	10	7.364	Yes	1	No	50.2	2.1
Patient 2	1410	3	6	9	7.233	Yes	5	No	64.5	-2.6
Patient 3	3830	7	9	9	7.370	No	0	No	54.2	4.3
Patient 4	1187	7	8	9	7.318	No	0	No	52.9	-0.2
Patient 4'	1750	9	9	9	7.340	No	0	No	45.1	-1.8
Patient 5	3100	5	9	10	7.297	Yes	2	No	57.0	-0.3
Patient 6	3050	5	9	10	ND	Yes	3	No	ND	ND
Patient 7	3370	9	9	10	7.319	No	0	No	53.3	-1.7
Patient 8	1750	8	9	9	7.270	No	0	No	54.2	-3.0
Patient 8'	1650	8	9	10	7.300	No	0	No	57	-0.3
Patient 9	1550	1	6	8	7.114	Yes	4	Yes	75.5	-8.3
Patient 10	2135	2	6	8	7.322	Yes	3	No	50.1	-1.1
Patient 10'	1660	4	7	8	7.300	No	0	No	57.3	-0.2

Table : Neonatal outcome data following R during induction and maintenance for cesarean section. Thirteen children were delivered. Patients 4, 8 and 10 were twin pregnancies. UA : umbilical artery ; BE : base excess ; P : patient ; ND : not done ; V : ventilation. Duration is in minutes.

be safe for the neonates. Respiratory depression occurred in the six smaller infants but could easily be managed by brief mask ventilation. One neonate needed to be intubated due to difficult mask ventilation but could easily be extubated after 4 minutes. Five minutes after delivery, none of the babies required further respiratory support. These results are in line with previously reported data. In our experience with these 10 patients, R could safely be used during GA for cesarean section.

References

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Interaction of propofol and remifentanyl during induction of anesthesia : hemodynamic response.

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Introduction

Opioids are commonly associated with propofol to provide anesthesia. Continuous infusions of remifentanyl or other opioids help to decrease postintubation hypertension but can severely accentuate propofol-induced pre-intubation hypotension (1, 2). This study was designed to investigate the effects of different target effect-site concentrations of remifentanyl and propofol on the hemodynamics during induction and intubation.

Methods

Following institutional approval and informed consent 24 female patients, ASA I-II, 18-55 years, scheduled for elective gynecologic surgery were randomly allocated to receive a predicted remifentanyl effect-site concentration (Ce) of either 0, 2 or 4 ng/ml followed 5 min later by a predicted propofol effect-site concentration of 2 or 4 µg/ml. Predicted Ce of remifentanyl and propofol were delivered via the computer controlled infusion device Toolbox. Patients were premedicated with 0.2 mg glycopyrrolate I.M.. Loss of consciousness (LOC) was evaluated every 30 sec from start of TCI of propofol. 2 minutes after LOC the response to laryngoscopy without muscle relaxants was evaluated. Tracheal intubation was finally facilitated with succinylcholine

(1 mg/kg). Heart rate and arterial blood pressure were continuously recorded before induction, after loss of consciousness, before and after laryngoscopy and before and after intubation.

Data were analyzed using ANOVA, and Fisher exact test. $P < 0.05$ was considered significant.

Results

The patient characteristics were similar between the different treatment groups. LOC occurred at lower effect-site concentrations of propofol in all patients receiving remifentanyl infusion compared to those receiving placebo. Baseline SBP and DBP was higher in the group P2R4 and remained higher than SBP and DBP in the other RP groups throughout the investigation. Decreases of blood pressure were not significantly different between treatment groups at loss of consciousness.

In the patients receiving propofol only at a target concentration of 2 µg/ml laryngoscopy was not feasible without muscle relaxants. The patients woke up and the target concentration of propofol had to be increased. In the other groups haemodynamic responses to laryngoscopy and intubation decreased with increasing target concentrations of remifentanyl.

Group	Baseline	Start Prop	LOC	Pre-LAR	Post-LAR	Pre-INT	Post-INT
R0P2	132 ± 04	132 ± 11	113 ± 7	116 ± 6			
R0P4	134 ± 28	137 ± 24	106 ± 19	98 ± 8	104 ± 13	118 ± 8	187 ± 13
R2P2	146 ± 45	146 ± 42	132 ± 32	135 ± 30	149 ± 36	112 ± 21	136 ± 22
R2P4	171 ± 23	170 ± 21	150 ± 18	139 ± 16	142 ± 19	136 ± 15	172 ± 16
R4P2	145 ± 25	147 ± 33	119 ± 16	113 ± 21	134 ± 35	120 ± 29	153 ± 33
R4P4	152 ± 19	160 ± 19	126 ± 28	126 ± 24	120 ± 14	114 ± 10	131 ± 19

Conclusions

The results indicate that a combination of a continuous infusion of propofol at a target effect-site concentration of 4 µg/ml with a continuous infusion of remifentanyl at target effect-site concentration of 4 ng/ml was the most effective to prevent haemodynamic responses on laryngoscopy and intubation with minimal effects on pre-intubation haemodynamics.

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6% Hydroxyethyl starch 130/0.4 (VOLUVEN®) versus 3% modified fluid gelatin (GELOPLASMA®) for volume replacement in patients undergoing on pump cardiac surgery : preliminary results. D. DERAEDT, K. DE DECKER, S. CROMHEECKE, R. DE PAEP, I. RODRIGUS, P. VAN DER LINDEN, S. DE HERT. Departments of Anesthesiology, Intensive Care, and Cardiac Surgery, University Hospital Antwerp, Belgium.

Introduction

The effects of hydroxyethyl starches (HES) on the hemostatic system depend on their specifications, and more specifically on their "in vivo" molecular weight (1). A new HES, with a lower in vivo molecular weight (HES 130/0.4, VOLUVEN®) has recently been introduced. This new synthetic colloid appears to have fewer effects on hemostasis although maintaining the same effectiveness than other medium weight HES. This prospective randomized single blinded study compared this new HES specification to 3% modified fluid gelatin (Geloplasma®) in terms of hemodynamic efficacy and hemostatic effects in patients undergoing cardiac surgery with cardiopulmonary bypass (CPB).

Methods

After Ethic Committee approval and written informed consent, twenty patients scheduled for elective cardiac surgery were randomised to receive either 6% HES 130/0.4 or 3% modified fluid gelatin for per- and postoperative volume management (including CPB priming) from induction of anaesthesia until 20 hr after the end of surgery with a maximum dosage of 50 ml/kg. Efficacy was evaluated by comparing the amount of fluid infused to achieve routine hemodynamic goals

(mainly cardiac output). Hemostatic effects were evaluated by comparing perioperative blood loss and the need for transfusion of allogeneic blood products. Per- and immediate postoperative blood losses were measured from blood collected in surgical aspirations and drains. Total blood losses were calculated from preoperative estimated blood volume and hematocrit measured the day before the operation and at postoperative day 5 using the formula developed by SAMAMA *et al.* (2). Data between groups were compared using unpaired t-test and Fisher exact test. Statistical significance was accepted at $p < 0.01$. Data are expressed as mean \pm standard deviation.

Results

Demographic data were similar in both groups. There was no difference in any of the measured hemodynamic variables throughout the study period. The amount of crystalloids and colloids administered in the per- and the postoperative period were not different between groups (Table 1). Measured and calculated blood loss were similar in both groups. Accordingly, the amount of allogeneic blood product administered and the number of patients exposed to these products were not different between groups.

Table 1

Variable	3% modified fluid gelatin	6% HES 130/0.4
Operating room (ml/kg)		
Crystalloids	25.5 \pm 2.7	27.8 \pm 3.4
Colloids	20.4 \pm 6.9	19.5 \pm 5.0
Measured blood loss	11.6 \pm 14.3	11.4 \pm 16.5
Diuresis	8.2 \pm 5.5	7.3 \pm 4.4
Intensive care unit (ml/kg)		
Crystalloids	21.9 \pm 2.9	23.0 \pm 3.7
Colloids	34.1 \pm 13.6	24.8 \pm 10.4
Measured blood loss	11.9 \pm 19.0	10.3 \pm 12.4
Diuresis	21.7 \pm 7.0	32.1 \pm 10.8
Calculated total blood loss (ml/kg)	10.5 \pm 9.5	9.2 \pm 9.5

Conclusion

These preliminary results on twenty patients indicate that in patients undergoing cardiac surgery with CPB, 6% HES 130/0.4 has a similar hemodynamic efficacy as 3% modified fluid gelatin and is not associated with major hemostatic effects as evaluated by perioperative blood losses.

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Analysis and investigation of suspected allergic reactions after induction of general anaesthesia. GEUDENS, M. D., K. VRINTS, M.D., F. SOETENS, M.D., M. DE VEL, M.D., A. VAN DER DONCK, M.D., H. MEEUWIS, M.D. Department of Anaesthesiology, Sint-Elisabeth hospital, Turnhout.

Introduction

Severe allergic reactions during anaesthesia are rare, but potentially life-threatening events. To identify the causal agent, skin testing is usually done 4 to 6 weeks after the reaction (1). In this survey we report on patients with a suspected allergic reaction to intravenous anaesthetics correlated to the results found after skin testing.

Methods

Using the computer data-base of the department, the records of patients with a suspected allergic reaction within 10 minutes after induction of general anaesthesia, were reviewed. We defined suspected allergic reaction as a serious event, thought to be allergic in nature by the attending anaesthesiologist. The following variables were recorded: age at the time of the reaction, gender and drugs given at induction of general anaesthesia. Because of the retrospective nature of the study, to get a complete picture of all the signs and symptoms of the suspected allergic reaction was difficult; the use and dose of epinephrine was recorded as well as whether chest compressions were done and whether the surgery was postponed, to quantify the severity of the event. Intradermal skin testing was done after 4 to 6 weeks, as described in the article of M. FISHER (2). Patients were tested not only for the suspected drugs, but for most of the intravenous anaesthetics, available at that time. Percentage of patients in whom intradermal skin testing was done, was determined. In the patients with a positive skin test to an intravenous anaesthetic, we checked if this agent was given during the suspected allergic reaction. The most incriminated agents were determined.

Results

From 1976 to 2001 the records of 65 patients with suspected allergic reaction were reviewed. Mean age was 40 years. 47 patients (72%) were female. Distribution of the suspected allergic reactions according to age and gender is shown in table 1. 50 patients (77%) received Epinephrine IV or/and SC; when recorded, the average dose per case was 1.3 mg. In 12 patients (18%) chest compressions were done. In 22 patients (34%) surgery had to be postponed. There was no serious postoperative morbidity or mortality.

In 47 patients (72%) intradermal skin testing was realised. In 4 cases intradermal skin testing was negative; 3 of these patients were not tested 4 to 6 weeks after the suspected allergic reaction (respectively 4, 11 and 4 years after the suspected allergic reaction). 43 patients had positive intradermal skin tests; always, at least one of the products that tested positive, was used during the suspected allergic reaction. In 36 cases (84%) succinylcholine (with or without gallamine) was identified as the cause (table 2). Muscle relaxants as a group were responsible for 95% of the observed reactions.

Table 1

Distribution of suspected allergic reactions according to age and gender

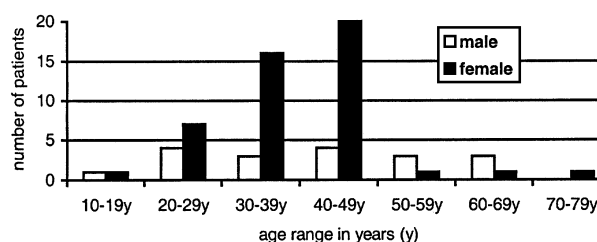


Table 2

Agents identified by skin testing as cause of the allergic reaction

Succinylcholine	33	77%
Gallamine	2	5%
Succinylcholine and Gallamine	3	7%
d-Tubocurare	1	2%
Atracurium	1	2%
Rocuronium	1	2%
Fentanyl	1	2%
Cefazoline	1	%
Total = 43 = 100%		

Conclusion

Skin testing is useful to identify the causal agent of an allergic reaction to intravenous anaesthetics. There is a female predominance and succinylcholine is the most incriminated agent.

References

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Admixture of 5 µg sufentanil or 75 µg clonidine is equally effective in reducing the minimum local analgesic concentration of ropivacaine for epidural labor analgesia. N. JANSSENS, L-C. THIRY, V. BONHOMME, P. Y. DEWANDRE, P. HANS, J. F. BRICHANT. University Department of Anaesthesia & Intensive Care Medicine, CHR de la Citadelle, Liege University Hospital, 4000 Liege, Belgium.

Background

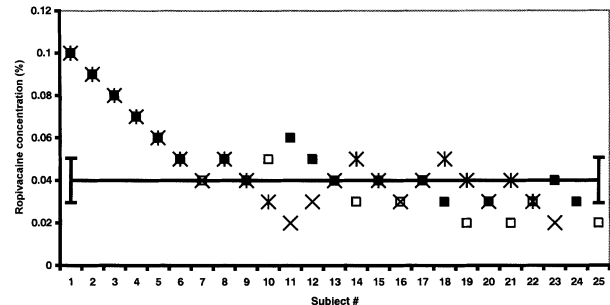
Addition of opiates or α_2 -adrenergic agonists to the epidural local anaesthetic analgesic mixture provides better labour analgesia with decreased local anaesthetic requirements and motor blockade (1-3). The aim of the present study was to compare the local anaesthetic sparing efficacies of 5 µg sufentanil and of 75 µg clonidine by determining the minimum local analgesic concentration (MLAC) of ropivacaine when associated to one of these medications.

Material and methods

In this randomised prospective study approved by the institutional ethics committee, 48 consenting parturients who requested labour epidural analgesia at a 1-5 cm cervical dilation with pain score > 7 on a 10 cm visual analog pain score (VAS) were allocated to 1 of 2 groups according to the analgesic mixture administered epidurally. After lumbar epidural catheter placement, 20 ml ropivacaine with 5 µg sufentanil (n = 25) or 75 µg clonidine (n = 23) was administered. The first ropivacaine concentration used was 0.1%, i.e. approximately the MLAC of ropivacaine when administered alone for early epidural labour analgesia. The subsequent concentrations of ropivacaine were determined by the response of the previous patient in that group, using an up and down sequential allocation. The testing interval was 0.01%. Analgesic efficacy was assessed using 10 cm VAS with VAS ≤ 1 cm within 30 min after the epidural bolus considered as effective. MLAC was calculated as the median of the ropivacaine concentration used in each group. 95% CI's were calculated as MLAC ± 1.95 × (standard deviation of the median). For power calculation, α value was set at 0.05.

Results

There were no differences in demographic, obstetric nor haemodynamic characteristics between the 2 groups. When 5 µg sufentanil or 75 µg clonidine were



Square : ro ivacaine + sufentanil ;

X or * : ropivacaine + clonidine ; closed or * : efficient ; open or X : not efficient ; line : MLAC's ± 95% CI.

added to ropivacaine, the MLAC of ropivacaine was 0.04% (95% CI : 0.030-0.050) and 0.04% (95% CI : 0.029-0.051), respectively. The power of this study was 90%.

Discussion and conclusion

Previous studies found MLAC values for ropivacaine ranging between 0.097 and 0.156% when administered alone for epidural labour analgesia. Our data suggest that the admixture of 5 µg sufentanil or of 75 µg clonidine is equally effective in reducing ropivacaine MLAC for early labour epidural analgesia. This is important to know when comparing the side effects of the admixture of these two drugs to epidural local anaesthetics for labour analgesia.

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The effects of clonidine and epinephrine on the duration of spinal analgesia in labor and possible adverse maternal and fetal effects. A. PEERAER, A. TEUNKENS, E. VANDERMEERSCH, M. VAN DE VELDE. Department of Anesthesiology, UZ Gasthuisberg, Leuven.

Introduction

Although combined spinal-epidural (CSE) analgesia is increasingly used in laboring patients, a drawback is the limited duration of the spinal component (1). We sought to determine whether spinal clonidine (clon) 30 µg combined with 2.5 µg epinephrine (epi) prolongs the duration of spinal analgesia. A randomized, blinded study comparing spinal ropivacaine + sufenta (PLAIN-group) with ropivacaine + sufenta + clon + epi (CLEP-group) was performed.

Methodology

Following ethical committee approval and patient informed consent, 50 healthy nulliparous parturients, with singleton, vertex pregnancies in active labor, were randomized to receive an intrathecal injection of ropivacaine 3 mg and sufentanil 1.5 µg with or without clon 30 µg and epi 2.5 µg in a volume of 2 ml, using CSE. Demographic data, hemodynamics, sensory level to pinprick, motor blockade using the modified Bromage score, fetal heart rate (15 minutes before and 30 minutes after spinal dose), onset time of analgesia (VAS < 25 mm), quality of pain relief, patient satisfaction, neonatal well being were recorded. The study was completed when patients requested additional analgesia. Patients delivering before requesting additional analgesia and failed spinals were not included in the final analysis. Data were analyzed using appropriate parametric and non-parametric tests. Data are presented as a mean ± SD. $P < 0.05$ is considered statistically significant.

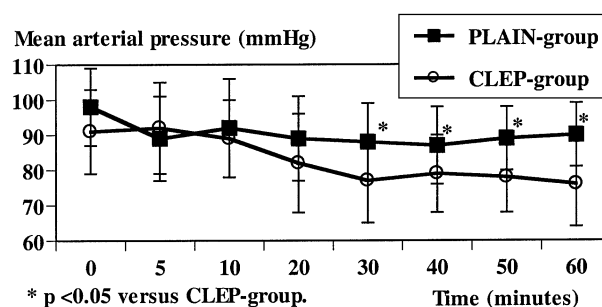
Results

Six patients delivered before requesting additional analgesia and in 3 parturients the spinal component of the CSE did not produce analgesia. Forty-one patients remained for final analysis (21 in the PLAIN-group and 20 in the CLEP-group). Demographic variables, data on

labor, cervical dilatation at study onset, onset time of analgesia, pain scores, and patient satisfaction were similar. The mean duration of analgesia was 90 ± 36 minutes for patients in the PLAIN-group and 122 ± 39 minutes for those in the CLEP-group ($P = 0.011$). The incidence of pruritus was similar. Nausea and motor blockade did not occur. Mean arterial blood pressure was significantly lower in the CLEP-group between 30 and 60 minutes (figure). More ephedrine was used in the CLEP-group. Umbilical artery pH was 7.251 ± 0.074 in the CLEP-group vs. 7.284 ± 0.081 in the PLAIN-group.

Discussion

In this study spinal clon 30 µg and epi 2.5 µg significantly prolonged labor analgesia from spinal ropivacaine 3 mg and sufentanil 1.5 µg, although the high incidence of hypotension and the tendency to worsen umbilical artery pH requires caution. Our results are in line with previous reports (2). We do not recommend to add clon and epi on a routine basis to the spinal mixture of a CSE-based labor analgesia technique.



References

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Effect of carrier gases on isoflurane vaporizer dial settings during minimal flow anesthesia.

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Background and Goal of Study

Uptake of a second gas of a delivered gas mixture decreases the amount of carrier gas and potent inhaled anesthetic leaving the circle system through the pop-off valve, causing the vaporizer setting (vap%) required to maintain a constant end-tidal (Et) sevoflurane % to be lower with O₂/N₂O than with O₂ with low fresh gas flows (FGF) (1). We now examined the effect of O₂, O₂/air or O₂/N₂O on the vap% required to maintain a constant Et isoflurane % (Et_{iso}) with a FGF of 0.5 L/min (= minimal flow anesthesia or MFA).

Materials and Methods

After IRB approval and informed consent, 42 ASA I-II patients presenting for peripheral surgery were randomly assigned to 1 of 3 groups (n = 14 each), depending on the carrier gas and FGF sequence : group O₂ or

group O₂/air (both MFA after 5 min high FGF) and group O₂/N₂O (MFA after 10 min high FGF). Vap% to maintain Et_{iso} at 0.75% were compared using analysis of variance (ANOVA) followed by Student - Newman - Keuls test. P < 0.05 was considered statistically significant.

Results and Discussion

After 10', vap% are identical for O₂ and O₂/air, but lower for N₂O (figure). With O₂/N₂O, less gas and vapor leave the pop-off valve than with O₂ or O₂/air because almost all of the delivered O₂ and N₂O is taken up by the patient. The vap% to maintain Et_{iso}, constant is therefore lower than with O₂ or O₂/air. Differences with N₂O fade with time because N₂O uptake decreases. Vap% do not differ between O₂ and O₂/air because almost all the delivered N₂ leaves the circle system. Other unexplored factors may contribute to our findings.

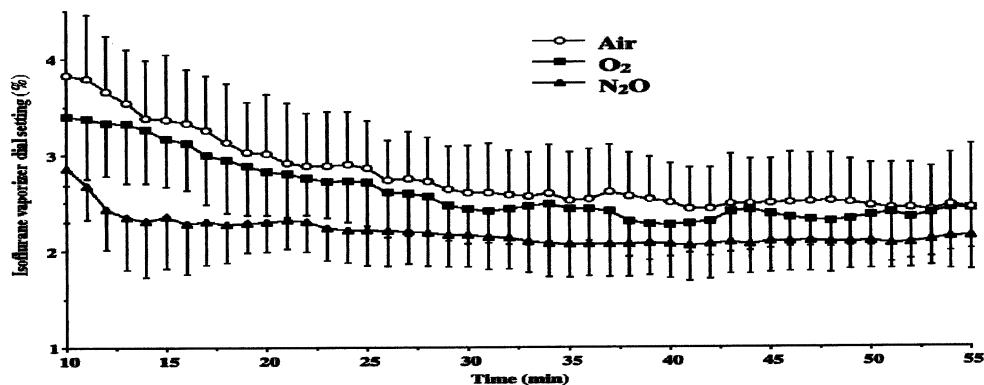


Fig. — Isoflurane vaporizer dial settings with different carrier gases during NWA. Air : Oxygen/Air group O₂ : Oxygen group N₂O : Oxygen/Nitrous oxide group

Conclusion

The choice of carrier gases affects the required isoflurane vaporizer dial settings during MFA.

Reference

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Cardiovascular Changes during Endoscopic Third Ventriculostomy in Children. J. VAN AKEN, T. VERPLANCKE, L. DE BAERDEMAEKER, M. STRUYS, J. CAEMAERT, E. MORTIER. Ghent University Hospital, Gent, Belgium.

Introduction

Little attention has been paid to the cardiovascular changes during anesthesia and surgery for endoscopic third ventriculostomy (ETV). A negative correlation between bradycardia (B) and third ventricular pressure during ETV was reported (1). Blood pressure (BP) or tachycardia (T) were not discussed. More recently was stated that invasive blood pressure measurement is unnecessary during endoscopic surgery in pediatrics (2). Because this contrasts with our experience, we studied retrospectively the incidence of B, T, systemic hypertension and the occurrence of an increased intracranial pressure (ICP).

Methods

After IRB approval, the anesthesia records of 37 patients who underwent an ETV during the last 12 years were examined. Anesthesia was induced and maintained with propofol, cisatracurium and remifentanyl or alfentanil. A radial or femoral artery was cannulated with a 22 or 24G catheter to monitor beat to beat the BP. The heart rate was recorded continuously via the ECG. In children, we considered B or T to be present if the heart rate decreased below or increased above the range according to the age of the child. Hypertension was defined as a BP above the 95th percentile for age.

Results

In 26 patients the procedure was uneventful. An isolated T or B was observed in 6 and 4 patients respectively. In 3 patients the T coincided with a systemic

Table

Cushing-group (n = 3) variable	median	minimum	maximum
age	7 years	4 months	10 years
weight (kg)	30	6.3	30
heart rate/min (highest)	140	130	140
heart rate/min (lowest)	70	55	105
systolic BP (highest)	200	120	210
systolic BP (lowest)	85	75	100
diastolic BP	50	40	60

hypertension (table). In these patients an increase in ICP was likely present, due to a kinking of the irrigation fluid outflow tubule or a forceful inflow of the irrigation fluid to clear an obtunded view by blood.

Discussion

Since B as well as T can occur during ETV, it is of utmost importance to monitor the BP beat to beat invasively. In this way, the surgeons can be warned in the early phase of a Cushing response, when T and systemic hypertension are present (3). Waiting for a persistent B could result in a fatal asystole (4).

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Comparison of Ropivacaine and Levobupivacaine in the three-in-one block used as an adjuvant post operative analgesic technique in knee and hip surgery. D. VERSTRINGE, B. REMY, M. LAMY. Anaesthesia and Intensive Care Medicine, CHU Liège, Belgium.

Introduction

Ropivacaine (ropi, G1) and Levobupivacaine (levo, G2) are less cardiotoxic than racemic bupivacaine. The purpose of this study is to compare their potency when used in three-in-one block as post operative analgesia in orthopaedic surgery.

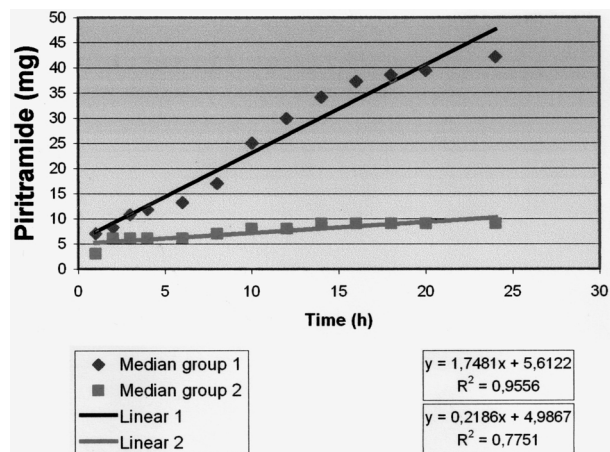
Methods

After approval of our Ethic Committee and informed consent, 20 patients scheduled for hip or knee surgery were included in this study. The block was performed with 200 mg of local anaesthetic (ropi for the 10 patients in G1 and levo for the 10 patients of G2), we used a neurostimulator and injection was made when the motor response was present at 30 mA intensity, the used needle was a short bevel one. Anaesthesia was a TIVA technique (propofol and remifentanyl). The systematic analgesia given to each patient was 2 g propacetamol every 6 hours (begin in the last half hour of surgery) and tramadol 400 mg in continuous infusion given on 24 hours (begin in the recovery room). A piritramide-PCA was initiated on the patient arrival in PACU. The PCA characteristic was 1 mg Piritramide for one bolus, max 5 boluses in 60 minutes and 5 minutes of lock out. We recorded the cumulative piritramide consumption hourly in each patient. Data were analysed with chi square and T student test when appropriate.

Results

Demographic and intraoperative data were similar in the 2 groups. We can see a lower consumption of piri-

tramide in the G2 (levo group) with a significant difference.



Conclusions

This study suggests the levobupivacaine is more potent than the ropivacaine in the three-in-one block.

References

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Anaesthetic management and perioperative course of right liver-lobe donation for living-donor liver transplantation. O. VINCK¹, L. HERREGODS¹, L. DE BAERDEMAECKER¹, M. STRUYS¹, R. TROISI², B. DE HEMPTINNE², E. MORTIER¹ (¹Department of Anesthesia, Ghent University Hospital ; ²Department of Surgery, Ghent University Hospital, De Pintelaan 185, 9000 Gent, Belgium).

Introduction

The increased number of patients awaiting a liver transplantation encourages the practice of adult-to-adult living-donor liver transplantation (ALDLTx). Although at first, only the left lobe was used, right lobe ALDLTx soon became a widespread therapy for patients with end-stage liver disease. In this report, we retrospectively review the perioperative course of 36 right-lobe adult liver-donations, performed between September 1999 and February 2003.

Methods

Institutional Review Board approval was obtained for this retrospective study. Characteristics of the donor, the donor-acceptor relationship, the anaesthetic management and the postoperative course were analysed. Data are presented as mean \pm SD, unless noted otherwise.

Results

Table 1 shows the patient characteristics of the donors, table 2 the donor-acceptor relationship.

Table 1

Mean \pm SD	Ranges (min-max)	
Age (year)	32,1 \pm 8,41	19 - 53
Weight (kg)	72,1 \pm 12,4	53 - 103
Height (cm)	170,1 \pm 10,3	149-188
BMI (kg/m ²)	24,9 \pm 3,5	20 - 32
Sex (male/female)	20/16	
ASA classification I/II/> II	29/7/0	

Table 2

	Nr	%
Father	0	0,0
Mother	1	2,8
Brother	2	5,6
Sister	1	2,8
Son	16	44,4
Daughter	10	27,8
Not blood-related	6	16,7

In 7 patients (19%), sufentanil was the used opioid, whereas 29 patients (81%) received remifentanyl. All donors were induced with propofol, but in only 26 (72%) of them, propofol was used as sole hypnotic agent. In 4 donors (11%) isoflurane, and in the remaining 6, a combination of propofol-isoflurane (8%) or propofol- sevoflurane (8%) was used. In all patients, cis-atracurium was used for induction and maintenance. All patients pre-donated between 350 and 1100 ml (545 \pm 192 ml) blood. Two patients suffered from acute blood loss with hypotension, necessitating inotropic treatment. Mean blood loss was 724 \pm 415 ml (range : 100-1600 ml). Intraoperative crystalloids (Plasma-LyteTM A) and colloids (Haes-SterilTM 6% or VoluvenTM 6%) attained respectively 4944 \pm 1642 ml and 986 \pm 540 ml (0,83 \pm 0,43 g/kg). 8 patients were given 1100 \pm 466 ml albumin 4%. We did not administer homologous blood or plasma, and only one patient needed 8 units of thrombocytes. In total, the donors received 6175 \pm 1900 ml of fluids (range : 3000-11.000 ml). The mean perioperative diuresis was 1304 \pm 649 ml or 1,77 \pm 0,88 ml/kg/h, but 14 patients (39%) had a period of oliguria and received 15,7 \pm 6,2 mg of furosemide. No respiratory complications were observed. The lowest mean perioperative temperature was 35,6 \pm 0,5°C. Hypothermia (< 35,5°C) was seen in 14 patients (39%). At the end of surgery, all patients were normothermic (36,5 \pm 0,5°C). The tracheal tube was removed in 32 patients (89%) in the operating room and in 4 others in the ICU within 16,3 \pm 8,5 hours after their arrival. Table 3 shows the evolution of the perioperative liver function tests, haemoglobin and lactate levels. In two patients (6%) a re-intervention was requested (rebleeding or bilioma). One or more perioperative complications were recorded in 19 patients (53%) (UTI, PONV, high CK-levels, oliguria). The mean ICU discharge time was 2,1 \pm 0,7 days. 14,1 \pm 6,1 days after the procedure, donors were discharged from the hospital, with a range of 8 to 39 days.

Table 3

	Hb	PT	Bili T	Bili D	Alb	GOT	GPT	Lact
Preop	14,4 \pm 1,6	90,7 \pm 7,7	0,78 \pm 0,41	0,25 \pm 0,22	4,4 \pm 0,3	19,0 \pm 5,1	25,6 \pm 15,0	
Postop	12,2 \pm 1,9	58,9 \pm 9,9	1,68 \pm 0,89	0,70 \pm 0,42	2,8 \pm 0,4	146,0 \pm 55,0	167,6 \pm 78,0	27,5 \pm 11,5
POD 1	12,3 \pm 2,3	46,0 \pm 9,5	3,12 \pm 1,72	1,14 \pm 0,89	2,8 \pm 0,4	187,3 \pm 132,2	212,7 \pm 199,4	16,5 \pm 5,9
POD 7	12,4 \pm 4,5	87,8 \pm 11,2	1,75 \pm 0,84	1,05 \pm 0,61	3,1 \pm 0,3	68,8 \pm 29,0	110,2 \pm 47,1	
POD 30	12,2 \pm 1,8	89,3 \pm 11,4	2,70 \pm 0,23	0,86 \pm 0,12	4,4 \pm 3,2	55,0 \pm 19,0	96,0 \pm 18,0	

Conclusions

Though right-lobe living-donor surgery is well tolerated, and follow-up revealed no major postoperative morbidity, a relative high incidence of postoperative complications was noticed. Since the risk of perioperative bleeding is real, invasive monitoring of arterial and central venous pressure and sufficient intravenous access are imperative.

Postoperative admission in the ICU is advisable.

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Tramadol versus morphine for preemptive analgesia following anaesthesia with desflurane and remifentanyl. N. ZAÏDI, M.D., J. M. EBA, M.D., EWALENKO P., M.D., Ph.D. Department Anaesthesia-Reanimation of the Jules Bordet Institute, ULB, Brussels, Belgium, 1, rue Héger-Bordet, 1000 Bruxelles.

Goal

Fast recovery without side effects is a desirable feature in anaesthesia. Desflurane (D) is the volatile agent with the fastest elimination time and remifentanyl (R) is an ultrashort acting opioid. Emergence with these products is thus rapid though preventive analgesia must be provided due to the on/off effect of remifentanyl. In this study, we wanted to compare the efficacy of tramadol (T) and morphine (M) used as prevention of immediate postoperative (PO) pain after, anaesthesia with D and R of more than 2 hours duration in two categories of surgical procedures: laparotomy or thyroidectomy.

Methods

After ethics committee approval and informed consent, 17 adult patients (pts) of either sex, ASA I to II were enrolled. After premedication with midazolam, anaesthesia was induced with propofol 2 mg/kg, rocuronium 0.6 mg/kg and R 0.25 mcg/kg/min. After intubation, D was inhaled in a mixture of air/O₂ with a maintained 2-3% endtidal. 40 minutes before the end of surgery, a slow bolus of M 0.2 mg/kg or T 2 mg/kg was given by blind randomisation. Anaesthesia was discontinued at the end of wound closure. Recovery parameters were noted using the Aldrete score, as well as pain score, PONV. If necessary (VAS score > 3), a second halved dose of T or M was given up to 10 minutes after extubation. Subsequent analgesia was done with M by PCA. Cardiovascular and respiratory parameters, sedation, pain level, PONV occurrence, M consumption were evaluated at regular intervals during 24 h PO. Statistical analysis was done using Staviw[®], with $p < 0.05$ as significant.

Results

There was no difference in age, sex, weight, ASA status or duration of anaesthesia and surgery between group T and M. Aldrete score, VAS, SVS, sedation and

cardiovascular status were not different during emergence from anaesthesia. In each group, VAS were rather high during the 1st hour (fig. 1). 2 laparotomy pts experienced early severe pain and restlessness, with VAS > 6, requiring boluses of M. Total M consumption seemed lower in T pts (NS – fig. 2), otherwise VAS scores, sedation, PONV and other parameters were comparable throughout the 24 h PO.

Discussion

The combination of D and R provide a rapid emergence from anaesthesia, characterised sometimes by unacceptable but short lasting severe pain and agitation, despite M or T given intraoperatively. In this subset of laparotomy pts, acute tolerance after R could provide an explanation. The combination of D and R, 2 short acting anaesthesia products with no residual effect, may have facilitated early PO pain and a tolerance effect, which is known to occur very shortly after the nociceptive procedure and gradually disappear. T and M were equally poorly effective in these cases.

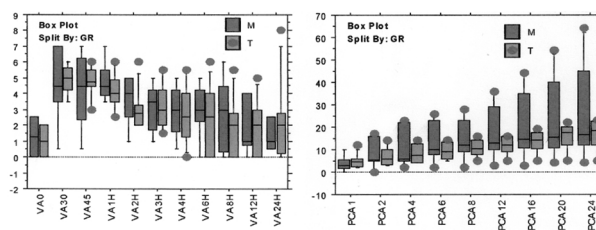


Fig 1. — VAS scores : higher at 1st hour then decreasing with time.

Fig. 2. — Cumulative M consumption/ PCA : no statistical difference between groups, but greater dispersion in M group.

Conclusion

M or T can be used for the prevention of early PO pain after R based anaesthesia but neither M nor T could prevent in some patients acute tolerance to R. D and R may not be the ideal combination in procedures known to be very algogenic.