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## *Comparison of intrathecal low-dose ropivacaine and lidocaine associated with sufentanil for knee arthroscopy in ambulatory setting.*

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*Introduction*

General anesthesia as well as intrathecal anesthesia can be performed for knee arthroscopy in ambulatory setting. Since the intrathecal use of lidocaine is known to produce transient neurological symptoms, ropivacaine is used as alternative, but is expected to delay recovery. In this prospective, randomized, double blinded study, we investigated the difference between equipotent doses of ropivacaine and lidocaine, and general anesthesia in onset time, per- and postoperative analgesia, recovery of sensory and motor function, voiding and discharge time.

*Materials and Methods*

After approval of the ethical committee and written informed consent, patients undergoing knee arthroscopy in ambulatory setting, choosing intrathecal anesthesia, were randomized in two groups.

Group 1 (n = 30) received 12 mg of ropivacaine with 2,5 µg of sufentanil, group 2 (n = 30) received 25 mg of lidocaine with 2,5 µg of sufentanil. The spinal puncture was performed at the L3-L4 or L4-L5 interspace with a 27 Gauge Whitacre needle in lateral decubitus, with the operating site down. The following data were recorded : onset, offset and level of sensory and motor block (using the modified Bromage score) ; time to ambulation, urination and discharge ; need for conversion to general anesthesia ; need for additional peroperative analgesia or sedation and postoperative analgetics ; patient satisfaction score. Statistical analysis of the data was performed using the one-way ANOVA test.

*Results*

The mean age was a little higher in the ropivacaine group (51,7 years vs 45,5 years). Gender was as good as equally devided (ropivacaine 15 men-15 females ; lidocaine 17 men-13 females), except in the control group we noticed an overweight of men (22/8). In all the groups a mean satisfaction score around 9 to 10 was calculated. Twenty-five minutes was the operating time in the ropivacaine group in comparison with 31 minutes in the lidocaine group (GA : 29 minutes). In the ropivacaine group we needed twice to convert to general anesthesia because of insufficient block (= 6%). In the lidocaine group four patients needed conversion (= 13%), three because of insufficient block, one because of intolerance to the garrot. In both groups sedation was given to five patients (ropivacaine group = 18%, lidocaine group = 19%).

The mean motor onset time (= modified Bromage score of 2 or more) in the ropivacaine group was 9,8 minutes in comparison with 7,8 minutes in the lidocaine group. Concerning the sensory onset times (block to L1 or higher), we calculated an mean time of 11,6 minutes in the ropivacaine group and 9,5 minutes in the lidocaine group.

There was as good as no need to postoperative analgesia in the groups who received intrathecal anesthesia. The mean time to first ambulation : 277,3 minutes (ropi) versus 198,5 minutes (lido) ; mean voiding time : 279,7 minutes (ropi) versus 204,4 minutes (lido). Finally the mean discharge time was 313,3 minutes in the ropivacaine group in comparison to 269,6 minutes in the lidocaine group.

| | Ropivacaine | Lidocaine | P |
|---|---|---|---|
| Mean motor Offset (BS = 0) | 166,5 min | 118,2 min | 0,001046 |
| Mean sens. Offset (block < = L2) | 147,5 min | 107,3 min | 0,000661 |

*Discussion*

Because of the use of low-dose LA, a good puncture method is necessary to avoid spoiling and by that insufficient block. We converted to general anesthesia when there was insufficient block after 20 minutes post-puncture time. No TNS was seen, but short follow-up time. Difference in discharge times between both groups is not significant, but surgeon discharged all his patients at the same time.

*Conclusion*

Both intrathecal local anesthetics can be used in ambulatory setting. We recorded not one patient with transient neurological symptoms. The study seems to confirm our hypothesis that lidocaine causes a faster onset as well as offset of both motor and sensory block and has shorter times of first ambulation and voiding. We also registered a low number of patients who needed conversion to general anesthesia in both groups.

*References*

1. Gautier P. E., *et al.*, *Intrathecal ropivacaine for ambulatory surgery*, Anesthesiology, **91** (5), 1239-45, 1999 Nov.
2. Gürkan Y., *et al.*, *Spinal anesthesia for arthroscopic knee surgery*, Acta Anaesthesiol. Scand., **48**, 513-517, 2004.
3. Chester C., *et al.*, *Small dose intrathecal lidocaine versus ropivacaine for anorectal surgery in ambulatory setting*, Anesth. Analg., **95**, 1253-125, 2002.

## *Comparison of intrathecal low-dose bupivacaine and lidocaine associated with sufentanil for knee arthroscopy in ambulatory setting.*

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*Introduction*

General anesthesia as well as intrathecal anesthesia can be performed for knee arthroscopy in ambulatory setting. Since transient neurological symptoms (TNS) were observed during the intrathecal use of lidocaine, many anesthetists prefer other local anesthetics such as bupivacaine and ropivacaine. These however might delay recovery and lead to delayed discharge. In this prospective, randomized, double-blinded study, we compared the effects of equipotent doses of lidocaine and bupivacaine on postoperative analgesia ; onset and recovery of motor and sensory function ; voiding, ambulation and discharge times.

*Materials and Methods*

Following ethical committee approval and written patient informed consent, ninety patients undergoing knee arthroscopy in ambulatory setting, choosing for intrathecal anesthesia, were randomized into 2 groups. Group 1 (n = 30) received 8 mg of hyperbaric bupivacaine with 2,5 µg of sufentanil and group 2 (n = 30) received 30 mg of lidocaine with 2,5 µg of sufentanil. Thirty patients choosing for general anesthesia formed the control group. The spinal puncture was performed at the L3-L4 or L4-L5 interspace with a 27 Gauge Whitacre needle, in lateral decubitus with the operating side down. Onset, offset and level of sensory and motor block (using the modified bromage score) ; time to ambulation, voiding and discharge ; need for conversion to general anesthesia ; need for additional postoperative analgesics and patient satisfaction were recorded. Statistical analysis of the data was performed using the one way ANOVA test.

*Results*

There were no significant differences among the two groups with respect to age or duration of surgery. In the bupivacaine group, only one conversion to general anesthesia was recorded, while in the lidocaine group there were 4 conversions.

The average time to recorded motor block bromage 2 or 3 was 8.7 minutes in the bupivacaine versus 7,8 minutes in the lidocaine group. But there were 5 cases in both groups where surgery started before reaching a bromage score 2 or 3 (if this would ever have been reached at all), so they were not included. The average time to sensory level of L1 or higher was 9.5 minutes in the bupivacaine as well as in the lidocaine group. The average time to complete offset of motor block was 123,6 minutes in the bupivacaine group and 118,2 minutes in the lidocaine group. Average time of regression of sensory level to L2 or lower was 157.5 in the bupivacaine versus 107.4 minutes in the lidocaine group, which proofed statistically significant. There was almost no need for supplemental postoperative analgesia in both groups (2/29 patients in the bupivacaine and 1/26 in the lidocaine group). Average satisfaction scores did not differ between the two groups (9.1/10 versus 9.3/10). We didn't record any complications. And finally there seemed to be a statistically significant difference in voiding time, time to ambulation and discharge time in favor of the lidocaine group (figure). Data are presented as mean time (in minutes) +/- SD ; $p < 0,05$ was considered significant.

| | *bupivacaine* | *lidocaine* | *control* | *p* |
|---|---|---|---|---|
| *voiding* | 259 +/- 60 | 204 +/- 48 | 207 +/- 67 | < 0,05 |
| *ambulation* | 248 +/- 51 | 198 +/- 48 | 200 +/- 63 | < 0,05 |
| *discharge* | 319 +/- 66 | 269 +/- 69 | 293 +/- 75 | < 0,05 |

*Conclusion and discussion*

This study confirmed that patients undergoing knee arthroscopy with intrathecal anesthesia in an ambulatory setting are discharged sooner when lidocaine has been used, as opposed to bupivacaine. There were a few more conversions to general anesthesia in the lidocaine group, but this could be due to other factors, such as timing of incision, as we recorded that 2 of these patients did have a sufficient block when they arrived in the recovery room. We recorded almost no need for supplemental analgesia postoperatively. We didn't record any complications, but follow-up time was short.

*References*

1. Williams N., *et al., Spinal anaesthesia for transurethral surgery : comparison of 2% lignocaine with hyperbaric 0,5% bupivacaine*, British Journal of Anaesthesia, **75**, 9-11, 1995.
2. Beilin Y., *et al., Subarachnoid small-dose bupivacaine versus lidocaine for cervical cerclage*, Anesthesia and Analgesia, **9**, 56-61, 2003.
3. Korhonen A.-M., *Use of spinal anaesthesia in day surgery*, Current Opinion in Anaesthesiology, Vol. 19 (6), p 612-616, December 2006.

## *Comparison of intrathecal low-dose ropivacaine, bupivacaine associated with sufentanil for knee arthroscopy in the ambulatory setting.*

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### *Introduction*

General anesthesia as well as intrathecal anesthesia can be performed for knee arthroscopy in the ambulatory setting. Bupivacaine may delay the recovery of motor function, cause urinary retention and lead to delayed discharge. Ropivacaine in equipotent dose is found to to have equal duration of sensory block, but motor block is reduced in duration and intensity. In this prospective, randomised, double-blinded study, we investigated the difference between equipotent doses of these two local anaesthetics in per- and postoperative analgesia, recovery of motor and sensory function, voiding and discharge time.

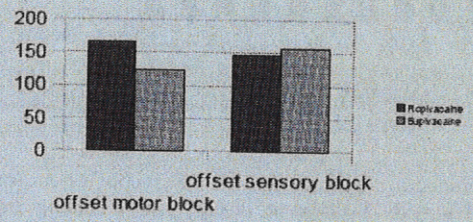
### *Materials and Methods*

The Local Ethics Committee approved the study. After written informed consent, patients undergoing knee arthroscopy in the ambulatory setting, choosing intrathecal anesthesia, were randomised in 2 groups. Group 1 (n = 30) received 12 mg of ropivacaine with 2,5 µg of sufentanil, group 2 (n = 30) received 8 mg of hyperbaric bupivacaine with 2,5 µg of sufentanil. Thirty patients choosing general anesthesia formed the control group. The spinal puncture was performed at the L3-L4 or L4-L5 interspace with a 27 Gauge Whitacre needle, in lateral decubitus with the operating side down. Onset, offset and level of sensory and motor block (using the modified Bromage score) ; time to ambulation, miction and discharge ; need for conversion to general anaesthesia ; need for additional postoperative analgetics and patient satisfaction were recorded. Statistical analysis was performed using the one-way ANOVA test.

### *Results*

There were no significant differences among the two groups with respect to age or duration of surgery. In the ropivacaine group there where 2 conversions to general anesthesia, while in the bupivacaine group there was only 1. There were few patients needing supplemental postoperative opioids (1/28 for the ropivacaine group and 2/29 patients in the bupivacaine group).

Offset of motor block was significantly shorter for the bupivacaine group, offset time for sensory block was shorter, although not significant for the ropivacaine group (Fig.). Time to ambulation was significantly shorter for the bupivacaine group (Table). There was no significant difference in voiding and discharge time and patient satisfaction. One patient of the bupivacaine group required a bladder scan and a single urethral catheterisation. Data are presented as mean time (in minutes) ; $P < 0,05$ was considered significant.




| | Ropivacaine | Bupivacaine | P |
|---|---|---|---|
| voiding | 279,7 | 259,5 | 0,15 |
| ambulation | 277,3 | 247,8 | 0,02 |
| discharge | 313,3 | 319,3 | 0,72 |
| satisfaction | 8,9 | 9,1 | 0,35 |

### *Conclusion*

Our results show in favour of bupivacaine a faster recovery of motor function, shortest time of ambulation, voiding and discharge and a greater patient satisfaction.

### *Discussion*

Our results demonstrate no clear benefit from ropivacaine compared to bupivacaine in equipotent dose. This is not in accordance with earlier studies who reported a reduced duration of motor block if ropivacaine was used.

### *References*

1. Boztug N., *et al., Comparision of ropivacaine and bupivacaine for intrathecal anesthesia during outpatient arthroscopic surgery*, J. Clin. Anesth., **18**, 521-5, 2006.
2. Kallio H., *et al., A comparison of intrathecal Plain Solutions containing ropivacaine 20 or 15 mg versus bupivacaine 10 mg*, Anesth. Analg., **99**, 713-7, 2004.
3. Gautier P. E., *et al., Intrathecal ropivacaine for ambulatory surgery*, Anesthesiology, **91**, 1239-45, 1999.