A survey of obstetric anesthesia practices in Flanders – 10 year update

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Abstract: We assessed the practice of obstetric anesthesia in Flanders through an on-line enquiry form and investigated the advancements by comparing the results with those of the 2004 survey. 54 (86%) structured forms were completed, representative for 94% of the accredited maternity beds in Flanders. Obstetric anesthesia is provided in all Flemish acute hospitals and 7/10 deliveries are performed nowadays with neuraxial analgesia. For labor analgesia, classical epidural remains the main neuraxial technique (62%) whereas CSE is used as default technique in 17% of the hospitals and upon indication in 21%. In half of the departments a test dose is used to validate the correct placement of the catheter, with lidocaine as the most (68%) commonly used test drug; this practice is comparable to 10 years ago. Ropivacaine (84%) with or without sufentanil is typically used as loading dose and ropivacaine with sufentanil (83%) to maintain the epidural analgesia. Patient-controlled epidural analgesia is the preferred maintenance mode (76%) for labor analgesia. CSE with hyperbaric bupivacaine and sufentanil is the most used anesthesia protocol when caesarean section is required (47%). There is no clear preference for postoperative analgesia after cesarean section as both epidural/regional and parenteral/per os analgesia regimens are almost equally used in Flemish obstetric care.

Key words: Obstetric anesthesia; analgesia for labor; caesarean section; postoperative analgesia.

While deliveries in Flanders and University Hospital Brussels have declined consistently over the last 4 years, the total number of deliveries in 2014 (n = 66,966) is still 7% higher than 10 years ago (Fig. 1). Obstetric anesthesia is provided in all 63 Flemish acute hospitals with a maternity. Considering that seven out of ten deliveries are performed nowadays with neuraxial analgesia, we may claim that obstetric anesthesia has become the rule rather than an exception in the Flemish maternities. However, the extent to which anesthesia is applied varies significantly across hospitals (Fig. 2).

This study has a dual goal. On the one hand, this research aims to give insight in today’s clinical obstetric anesthesia practice in both the technical aspects of neuraxial analgesia and anesthesia policies for labor, deliveries and postoperative care. On the other hand, we evaluate the evolution of this practice in Flanders over the course of 10 years.

Methods

In 2014, we invited the heads of the anesthesia departments of the 63 Flemish hospitals with a maternity to participate in an on-line survey. The questionnaire consisted of 25 questions concerning 3 themes:

1. Analgesia for labor, reviewing the department’s analgesia techniques during labor.
2. Anesthesia for caesarean section (CS), outlining the anesthesia policy for patients undergoing CS.
3. Postoperative analgesia after CS, investigating the hospital’s postoperative pain control protocol after CS.

Figure 3 summarizes the investigated topics, reflected in this paper. A reminder e-mail was sent when no answer was obtained within one month. If the reminder proved ineffective, we contacted the department by phone. We closed the survey three weeks after this final phone call. The results were analyzed and compared to the outcome of the 2004 obstetric anesthesia practices’ survey of Van Houwe et al. (1).
Fig. 1.— Evolution of deliveries in Flanders (2)

Fig. 2.— Evolution of epidural analgesia in childbirth in Flanders (2)

Fig. 3.— Structure of survey and paper, including overview of topics investigated

RESULTS

We received 54 (86%) completed surveys, representing 94% of the accredited Flemish maternity beds.

Analgesia for labor

Nil per os (NPO) policy

- The NPO policy during labor is in three out of four practices restricted to clear liquids before and during labor (Fig. 4). While five practices do not allow any food or drinks, nine hospitals allow food with some restrictions. Two practices further stipulated that they restrict diet to yoghurt and rusks. In two other centers a stage-based NPO pol-
icy is implemented: they allow lights meals before and during the initial stages of labor and switch afterwards to a clear liquids policy. One practice allows food without any restrictions.

**Neuraxial analgesia**

- The classical epidural analgesia remains the most common technique for labor (62%) (Fig. 5). 17% of the practices use combined spinal and epidural (CSE) as default neuraxial analgesia technique, a slight increase from 2004 (14%). In 21% of the practices, CSE is used upon indication including multiparous women with more than 5 cm of cervical dilatation, late labor and vaginal birth after CS.

**Patient positioning**

- Positioning patients by default in lateral decubitus for the neuraxial block has become a marginal practice (2%) in Flanders. While the upright position remains (55%) the standard, more than 40% of the hospitals perform CSE and epidural analgesia in both positions. Participants stated that indications to prefer the upright position are (morbid) obesity and unusual anatomy.

**Loss of resistance**

- In most centers (83%), the loss of resistance technique is performed with NaCl 0.9%. 15% of the hospitals indicated that they use NaCl 0.9% or air. When both techniques are used, routine/preference of the anesthetist determines the choice between techniques. Two directors do not use NaCl 0.9% or air, one hospital uses lidocaine 1% and the other hospital uses mepivacaine 1%.

**Test dose**

- As 10 years ago half of the anesthesia departments uses test doses (56%). The correct placement of the catheter is tested in 68% with lidocaine, combined with epinephrine in half of these practices. Other policies are: plain ropivacaine (n=2), ropivacaine with sufentanil (n=2), plain bupivacaine 0.125% (n=1), bupivacaine 0.125% with epinephrine (n=1) and levobupivacaine with sufentanil (n=1). When ropivacaine or levobupivacaine is used as test dose, it is also used as a loading dose. One hospital noted that they only administer test doses for educational purposes (residents). Finally, five hospitals mentioned using an epinephrine concentration of 1/200,000.
Epidural loading dose

- 39 centers disclosed their classical epidural analgesia technique. 33 (84%) hospitals prefer 4-15 mL of 0.15-0.20% ropivacaine as local anesthetic for the loading dose, which is slightly higher to 10 years ago (Fig. 6). When using ropivacaine, it is used in 66% of the cases in combination with sufentanil (1-10μg/mL). Six (15%) hospitals use 8-12mL of 0.20% ropivacaine without sufentanil. One practice combines ropivacaine with fentanyl. Three (8%) departments prefer 10-15 mL of 0.125% levobupivacaine with up to 10μg/mL sufentanil, one practice additionally adds 75-150 µg clonidine. Bupivacaine 0.25% is used in two centers, one time as a 5-10mL plain dose and one time as a 10mL dose with 10μg of sufentanil and 1/200,000 epinephrine. Once 5 mL of lidocaine was reported as loading dose.

CSE loading dose

- Ropivacaine is the most used CSE-loading dose (66%). Hospitals using ropivacaine with sufentanil administer 1-2 mL of ropivacaine 0.15-0.2% with 1-2.5 μg sufentanil. A higher dose of ropivacaine is administrated (up to 6 mg), if not combined with sufentanil. Levobupivacaine is administered as CSE loading dose in three anesthesia departments. Two of these departments use a 2.0-2.5mL combination of 0.125%-0.5% levobupivacaine with 2-5 μg sufentanil and one department administrers 3mL of plain 0.125% levobupivacaine. One hospital injects 2mL of 0.125% bupivacaine with 5μg sufentanil.

Maintenance method

- Analgesia during labor (Fig. 7) is in 76% of the departments maintained with patient-controlled epidural analgesia (PCEA) or PCEA plus continuous infusion; this is an increase of 18% in comparison with 2004. One practice reported that they combine PCEA with programmed intermittent epidural boluses (PIEB). Continuous epidural infusion halved over the last 10 years and is used in 17% of the hospitals. Top-up remains a marginal practice for maintenance of analgesia (5%).

Maintenance dose

- Regardless of the maintenance modus, ropivacaine with sufentanil is the most used anesthetic during labor (Fig. 8). The policy for PCEA plus
continuous infusion consists typically of 0.11-0.20% ropivacaine with 0.2-1.0 µg/mL sufentanil, with a basal rate of 2.9 mL/h, a bolus dose of 2.5 mL and a lock-out of 10-20 min. Continuous epidural infusion is mostly performed with 0.15%-0.20% ropivacaine with 0.2-0.5 µg/mL sufentanil at a rate of 6-10mL/h. When using PCEA without continuous infusion, the protocol (n=8) consists of a bolus dose of 2.5mL with a lockout of 10-20min of 0.13%-0.20% ropivacaine with 0.5-0.8µg/mL sufentanil. Only one practice uses 0.2% levobupivacaine at 4mL/20min.

**Remifentanil usage**

- Our results show that two centers have a protocol for remifentanil usage during labor. One of these two centers specifically mentioned in the free text box to only use this protocol in case an epidural analgesia was contraindicated.

**Anesthesia for CS**

In 2014, 20% of the deliveries were performed with a CS, which is an increase of 2% compared to 2004 (2). CSE (76%), spinal (17%), epidural (5%) and general (2%) are the different anesthesia techniques used (Fig. 9). The increased usage (+27%) of the CSE technique is notable. While analgesia for labor is mostly obtained with ropivacaine, anesthetists use a wider range of analgesics when CS is required (Fig. 10). We summarized the three most cited protocols for CSE, spinal and epidural analgesia.

**CSE**

- 37 practices disclosed their CSE protocol. The most used protocol (n=23, 63%) consists of 1.6-2.5 mL of 0.5% hyperbaric bupivacaine with 1.2-2.0 µg/mL sufentanil. Other frequently reported policies are 1.4-2.5 mL of plain 0.5% bupivacaine hyperbaric (n=5, 13%) and 2.0-2.5 mL of 0.5% levobupivacaine with 1.0 µg/mL sufentanil (n=5, 13%).

**Spinal**

- We collected 29 protocols for spinal technique. More than half (15/29) of these consist of 1.6-2.6 mL of 0.5% hyperbaric bupivacaine with 1.2-2.0 µg/mL sufentanil. Other frequently reported policies are 1.4-2.5 mL of plain 0.5% hyperbaric bupivacaine with 1-2 µg/mL sufentanil. Four practices (14%) reported using 1.5-2.5 mL of plain 0.5% hyperbaric bupivacaine while four other practices use 2.0-2.2 mL of 0.5% bupivacaine with 2 µg/mL sufentanil.

**Epidural**

- 14 different protocols for the epidural technique were reported. 25 out of 38 hospitals use ropivacaine (66%). 12 hospitals use 8-20mL of plain 0.75% ropivacaine, 7 departments administer ropivacaine in combination with 0.5-0.6µg/mL sufentanil, 3 hospitals use 18mL of plain 1-2% lidocaine.

**General Anesthesia (GA)**

- The range of CS under general anesthesia differs between lower than 1% (17 centers) and 10% (4 centers). The protocol for GA is highly standardized in Flanders. For induction propofol is administered (96%) and succinylcholine (45%) or rocuronium (38%) to facilitate endotracheal intubation and provide optimal surgical conditions. The remaining centers use mivacurium (n=1), atra-
curium (n=1) or no curarisation at all (n=4). GA is maintained with sevoflurane (81%) or propofol (11%). Sufentanil (57%) or fentanyl (15%) are used as analgesics. Half of the practices underlined that they only administer sufentanil or fentanyl after clamping of the cord. Key trends are the strong decrease in usage of thiopental (from 27% to 2%), ketamine (from 13% to 4%) and succinylcholine (from 69% to 45%) while there is notable appreciation for respectively propofol (from 71% to 96%), fentanyl (from 0% to 15%) and rocuronium (from 14% to 38%). The use of sugammadex for reversal of neuromuscular blockade by rocuronium is reported by 10 centers.

**Pulmonary acid aspiration**

- For prevention of aspiration pneumonia three types of drugs are used: Histamine-2 receptor antagonists (42%), oral antacids (34%) and gastropokinetics (25%). Six hospitals reported not to use any drugs to prevent acid aspiration prophylaxis. A combination of all three drug types is reported by 15 centers. Other protocols consisted of H2-antagonists (11 centers), H2-antagonists with antacids (8 centers), antacids (4 centers) and H2-antagonists with gastropokinetics (3 centers).

**Hypotension**

- To prevent maternal hypotension after spinal anesthesia for CS, pre-loading is preferred over co-loading (46 vs. 23 practices). Hospitals seem to be indifferent in the choice between colloids and crystalloids (36 vs. 33 practices) and this both when using the pre-loading or co-loading method. Maternal hypotension is treated by both neosynephrine and ephedrine in 26 practices. 20 practices only use neosynephrine while 12 practices only administer ephedrine. When both drugs are used, 12 hospitals indicated that they prefer neosynephrine as vasopressors unless patient’s heart rate is too low. Finally, one practice indicated to use both drugs but sometimes only administers atropine in case of hypotension.

**Metratonia**

- Lack of tone of the uterine walls is prevented and treated in a majority (n=42, 78%) of the practices by oxytocine. 21 practices reported using carbetocine and 11 centers administer methylergometrine (Fig. 11). Methylergometrine is used as second-line in 7 cases, mostly in intravenous (IV) bolus. Oxytocine is mostly administered in IV bolus (timeframe of minutes) followed by infusion (timeframe of hours). Carbetocine is administered in IV bolus, in seven practices in combination with oxytocine and in two hospitals as second-line medicine. Two anesthesia departments noted to use all 3 drugs in their practice. 12 hospitals did not disclose their protocol.

**Antibiotics**

- When performing a CS, 69% of the hospitals administer antibiotics. All practices but one use cefazoline 1 or 2g as prophylactic antibiotic. One hospital uses amoxiclav. Three moments for admin-
istration of the antibiotics were reported. Almost half of the practices (48%) prefer to administer the drugs after clamping of the cord while the other half does it before starting surgery. One fourth of the hospitals administers antibiotics before rupturing of the patient’s membranes (12%).

**Postoperative analgesia after CS**

Postoperative pain after CS is treated with an epidural/regional or a parenteral/per os analgesia regimen. In 2004, we identified no preference for either technique. The 2014 results show a slightly higher preference (3%) for epidural/regional analgesia (Fig. 12).

**Epidural/regional analgesia**

- PCEA/continuous epidural infusion is by far the most used (30 practices; 56%) epidural/regional analgesia technique. Other techniques are only used in a minor number of practices. The Transversus Abdominis Plane (TAP) block is used in 10 practices, of which six perform the block under ultrasound guidance, three apply the blind technique and one hospital uses both. Morphine as single neuraxial injection is administered in six centers epidural, and two intrathecaally.

**Parenteral/per os analgesia**

- Most hospitals use paracetamol (53/54) and non-steroidal anti-inflammatory drugs (NSAIDs) (45/54). 29 hospitals noted to use opioids as escape analgesics. 12 hospitals use strong opioids, 10 departments prefer weak opioids and five practices first administer weak opioids and reported to use strong opioids as second-line analgesic. Two respondents didn’t disclose which escape opioids to use. Finally, five practices use patient-controlled intravenous analgesia (PCIA).

**Discussion**

As this study evaluates 94% of the accredited Flemish maternity beds, the authors believe that the outcomes are reliable to evaluate the obstetric anesthesia practices in Flanders.

The increased demand for obstetric anesthesia in Flanders is not a generalizable international trend. While obstetric anesthesia practices in France have also further increased from 62% (2004) to 81% (2010) of all deliveries (3), the considerable lower Dutch rates have further decreased from 25% (2004) to 18% (2014) (4).

**Analgesia for labor**

A strong majority of the Flemish anesthetists applies a restrictive NPO policy by only allowing clear liquids during labor. The typical rationale among anesthetists for this policy is to protect against pulmonary aspiration if GA is required during emergency CS. A recent study investigating the effect of food intake during labor showed that applying a restrictive or liberal NPO policy does not impact the neonatal or obstetric outcomes in terms of delivery mode or duration of labor. While no evidence of harm could be detected in this large-scale study, the power of the trail was insufficient to imply safety, as acid pulmonary aspiration in obstetrics is very rare (5). These outcomes support the permission of both food and clear liquid intake during labor as more commonly allowed in e.g., the Netherlands (79% of clinicians (6)) and the United Kingdom (32% of birth units (7)). Nevertheless, the American Society of Anesthesiologists (ASA) Task Force on Obstetric Anesthesia concluded that there is an absence of literature evidence regarding the safety of specific fasting periods for both clear liquids and solids (8). The ASA’s practice guidelines hence recommend not to allow any solids for laboring women while allowing moderate amounts of clear liquids. The Belgian Association for Regional Anesthesia (BARA) concurs with the strict guidelines of the ASA (9).

Classical epidural analgesia remains the most used manner of neuraxial analgesia for labor although the CSE technique is heavily promoted in Flemish university training. A review of 27 randomized controlled trials concluded that there is little evidence in literature to prefer one technique over the other in labor as change of technique does not impact the neonatal, obstetric or mobilization outcomes (10). This might explain why various centers use both techniques and that preference/routine of the anesthetist is leading to the choice of technique. Another hypothesis from the authors to prefer classical epidural analgesia is that anesthesiologists prefer not to breach the dura if not required for e.g., rapid onset. Many young anesthetists starting in a hospital may take over the habitual protocol.

The sitting position is still the preferred position to perform the neuraxial block. As we reported 10 years ago (1), this is motivated by an ostensibly augmented ease of access to the epidural space. Moreover, research concerning the CSE technique for CS delivery confirms that performing CSE in the sitting position is technically easier and furthermore results in less severe hypotension (11).
Only half the Flemish hospitals use a test dose for obstetric neuraxial analgesia. Nevertheless, these doses are recommended as they allow early identification of inadvertent intrathecal or IV placement (12). Traditional test doses, consisting of a combination of local anesthetic and epinephrine, are used in the majority of practices in Flanders. These traditional test doses are increasingly becoming a controversial topic as administration of epinephrine can result in a reduction of uteroplacental blood flow (13). This argument, however, is not supported by animal models where there was no impact on fetal well-being (13). Nevertheless, some authors do recommend not using the traditional test dose and using instead the first analgesic dose, which are low-dose mixtures nowadays (14). Their argument is based on research (15,16) showing that an analgesic dose is safe and provides a high-degree of sensitivity and specificity. This technique does require significant follow-up to detect local anesthetic systemic toxicity and to evaluate the effectiveness of the block. In short, it is clear that literature agrees that testing the correct placement of the catheter is required but no consensus has yet been reached on which test dose to use for validation.

10 years ago, Flemish practitioners already preferred ropivacaine above bupivacaine while there was no evidence that ropivacaine resulted in improved obstetric or neonatal outcomes (1). Nowadays, there is clear evidence that ropivacaine has a comparable to slightly less analgesic efficacy than bupivacaine but results in higher degree of motor sensory differentiation and reduced potential of both central nerve system toxicity and cardiotoxicity (17). However, considering the dose range used for labor analgesia, the clinical toxicity impact is probably unimportant (18) and a prospective study showed that for labor epidural analgesia 0.075% concentrations of ropivacaine or bupivacaine with 2 µg/mL fentanyl provide equivalent pain relief (19). Furthermore, a meta-comparison for labor analgesia shows that there are no differences in terms of obstetric or neonatal outcomes (18). Considering these conclusive outcomes, should the most economical solution for the patients not be ensured?

More than 20% of the practices do not dilute their concentrations of local anesthetics with opioids for epidural loading doses. Nevertheless meta-analyses of randomized-controlled trials have shown better analgesic quality of diluted anesthetics versus undiluted anesthetics (8). Furthermore, the ASA recommends these lower concentrations to produce as little motor block as possible (8).

While the usage of continuous epidural infusion has halved over the last 10 years, it is still used by nine centers. This despite the fact that many studies have reported that intermittent boluses provide more effective maintenance of labor analgesia and reduce the consumption of both local anesthetic and rescue analgesics compared to continuous infusion (12). This also holds when PCEA systems are used hence PCEA plus automated intermittent bolus or PCEA plus PIEB (12) provide improved care for women in labor than traditional PCEA or PCEA plus continuous infusion. However, these newer maintenance systems haven’t yet been widely applied – only one hospital uses PCEA plus PIEB – in Flanders.

Although ropivacaine with sufentanil is most commonly across all maintenance systems, we identified a wide variety of protocols for maintenance of analgesia during labor. The wide variety can be understood knowing that the ideal anesthetic has not yet been determined and the choice between bupivacaine, levobupivacaine, or ropivacaine has no significant impact (12,20).

Many researchers have stressed that the usage of remifentanil during labor is not without risks. Van de Velde recently evaluated the efficacy and safety of remifentanil PCIA and concluded that “routine use of remifentanil PCIA in labor cannot be recommended and must be discouraged” (21). He further counsels that any hospital using remifentanil during labor must use both capnography and saturation monitoring as well as 1:1 midwifery care and an anti-reflux valve. We hope that the two hospitals that have a remifentanil protocol use these safety measures when using remifentanil during labor. If this would not be the case, we concur with Van de Velde and urge that an extremely strict protocol should be implemented.

Anesthesia for CS

The World Health Organization indicated that there is no empirical evidence for an optimum rate of CS (22). In comparison with the Netherlands (16.4%, 2014 (4)) and France (21.0%, 2010 (23)), Flanders has a comparable rate (20.3%, 2014).

The CSE technique is increasingly appreciated by anesthetists for CS (+27% versus 2004). This rise is supported by literature which underlines that this technique combines the strengths of the spinal and epidural anesthesia while minimizing their drawbacks (24). Taken into account the significant lower CSE rates for women in labor, it is
reasonable to argue that advantages such as solid and prolonged anesthesia with low doses as well as extended postoperative analgesia are convincing anesthetists to prefer this technique for CS.

The authors were pleased to see that the rate of GA for CS is dropping as it should only be used in case of emergency grade 1 or contraindicated/failed neuraxial analgesia. However, this also results in a lack of training moments for both trainees as well as experienced practitioners. When benchmarking the Flemish archetype GA protocols to the ‘gold standard’ as recently published by investigators of the University Hospital Leuven (25), we note that Flanders scores excellent in terms of choice of induction agent (propofol) and maintenance of anesthesia (sevoflurane or propofol). However, succinylcholine is still the most used muscle relaxant in Flanders while its side-effects are well-documented. Hence, preference should be given to rocuronium. While 21 practices administer rocuronium, only 10 centers indicate to use sugammadex, implicating that 11 hospitals do not have any medicine to address the neuromuscular blockade when no train-of-two out of four ratio is obtained at the end of the CS.

The ASA recommends in their guidelines the “timely administration of non-particulate antacids, H2 receptor antagonists, and/or metoclopramide for aspiration prophylaxis” (8) but doesn’t further stipulate which drugs to use or upon which indication to administer these drugs. The guidelines of the Belgian association state that aspiration prophylaxis is mandatory for elective and emergency cesarean section, but only recommend to give at least oral non-particular antacids (9). This is understandable knowing that the quality of evidence in literature is poor as no study has shown substantial clinical outcome or identified the adverse effects of these drugs in CS settings (26). The high share of H2-antagonist usage, both as stand-alone use as well as in combination with antacids and/or gastroprokinetics, is probably due to early evidence indicating effectiveness in lowering the risk of intragastric pH < 2.5 at intubation (26).

Our survey showed a clear preference for pre-loading to prevent maternal hypotension. Nevertheless, surgery should never be delayed to complete fluid delivery as a meta-analysis (27) investigating hypotension following spinal anesthesia for CS showed no difference in hypotension rates with pre- or co-loading. Furthermore, outcomes are identical when using colloid or crystalloid loading (27). Hence, we recommend the use of the most economical solution.

31% of the hospitals reported to not administer antibiotics to patients undergoing CS which is surprising considering that prophylactic antibiotics for preventing maternal infection are beneficial to women (28), also in case of preterm rupture of membranes (29). Considering the timing of antibiotic administration, intravenous prophylactic antibiotics for cesarean section administered pre-operatively significantly decreases the incidence of maternal postpartum infectious morbidity as compared with administration after clamping of the cord (30). Hence the recommendation of the BARA to administer before skin incision (25). However, prenatal exposure to antibiotics may be linked to childhood obesity (31), so more research is needed to elucidate short- and long-term adverse effects for neonates.

Postoperative analgesia after CS

In a strong majority there is a preference for either the epidural/regional or the parenteral/per os analgesia technique. This could indicate that the practices are convinced of the advantages of their chosen technique. The ASA recommends using neuraxial opioids instead of intermittent injections of parenteral opioids considering that literature shows improved postoperative analgesia after CS with ambiguous findings for vomiting, nausea and pruritus (8).

Continuous epidural infusion and PCEA are most popular among epidural/regional techniques. This indicates that anesthetists prefer to maintain the epidural catheter for postoperative pain management rather than performing another regional analgesia technique such as the TAP block, which is only used in 10 practices. Such regional technique offers effective pain relief (32) and could additionally improve patients’ comfort levels thanks to increased mobilization of the new mother.

Eight practices use a neuraxial technique based on morphine, which has been both favored as well as discouraged by literature. As part of a multimodal analgesic regimen, subarachnoid morphine provides high-quality analgesia, yet has been discouraged to be used in clinical practices due to considerable side effects, such as substantial pruritus (32).

Regarding per os analgesia, it is important to keep in mind that there is no ideal multimodal oral analgesia regimen determined yet for cesarean section (33). Current thinking in research recommends a combination of acetaminophen, NSAIDs and rescue opioids as optimal regime.
CONCLUSION

Obstetric anesthesia is rather the rule than an exception in Flanders. The Flemish obstetric anesthesia practices modernized over the last 10 years and the majority of the practices are generally in line with the gold standards as outlined by latest literature and association guidelines. The current renewal momentum has to be maintained to prevent disconnections between clinical practices and the gold standards.

LIMITATIONS

This research has three weaknesses. First of all, respondents may not have given accurate or honest answers to the questions, potentially due to the fact that an honest answer might present the anesthetist and his/her practice in a negative manner. Next, there might be a bias in some questions as the opinion from the practitioners who responded might be different from the ones who did not respond. Finally, we could not enforce that the respondents provided all the requested information (e.g., product, dose, concentration) in the open-ended questions, resulting in some incomplete data points.

ACKNOWLEDGEMENT

We gratefully thank the anesthetists who participated in our survey for their time and consideration.

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