

Original Research Article

Anesthetic For Cesarean Section: The Current Practice in Kurdistan Region-Iraq

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Abstract

A national survey designed to find out the preferred drugs choices for the induction and maintenance of general anesthesia as well as post-delivery analgesia for cesarean section. All members of Kurdistan Anesthesiologist Association were invited to respond this survey. 58% (n = 94) response rate is achieved. Propofol is the induction agent of choice being used by 79% (n = 74) of respondents. The main reasons for this agreement about propofol use are its faster recovery effects (33%) and antiemetic properties (26.9%). The most commonly used agent for maintenance is Isoflurane 56% (n = 53) to be followed by halothane (36%, n = 34). However, sevoflurane will be the preferred agent for induction and maintenance if financial constraints withheld. Fentanyl (37%, n = 55) and meperidine (35%, n = 51) are the routinely used analgesic opioids post-delivery with general anesthesia for Cesarean section. 79% of respondents (n = 74) prefers to perform Transversus Abdominis Plane (TAP) block as postoperative analgesia in obstetric anesthesia if possible. The drug of choice for induction of obstetric anesthesia according to current national practice is propofol according to this survey. Anesthesiologists do not support the change to another agent, and they are fairly satisfied with their choice.

Key Words: Anesthesia, obstetric, induction, propofol, cesarean section.

التخدير لعمليات الولادة القيصرية: واقع الحال في كردستان العراق

الخلاصة

استبيان محلي تم تصميمه لاكتشاف الاختيار الدوائي الامثل لبدا وديمومة التخدير العام وكذلك المسكن الامثل لما بعد الولادة . جميع اعضاء هيئة الاطباء المخدرين في كردستان قد تمت دعوتهم للمشاركة في الاستبيان . نسبة الاجابة كانت ٥٨% . بروپوفول كان الدواء المفضل لبدا التخدير والمستخدم من قبل ٧٩% من المشاركين في الاستبيان لخصائصه في الافاقة السريعة ومنع الغثيان . الدواء المخدر الاكثر استخداما لديمومة التخدير هو الايسوفلوران يليه الهالوثان ولكن دواء السيفوفلوران سيكون الاختيار الامثل لبدا وديمومة التخدير اذا ما رفع التقيد المادي . مادتي الالفنتالين تالمبيريدين هما المستخدمان دوريا لتسكين الام ما بعد الولادة. ٧٩% من المشاركين في الاستبيان يفضلون طريقة التسكين تحت الغشاء المستعرض للبطن ان امكن ذلك . الاختيار الامثل لبدا التخدير في العمليات النسائية هو البريوفول طبقا لواقع العملي المحلي حسب نتائج هذا الاستبيان . لا يوجد هناك رغبة للأطباء المخدرين في التغيير وهم راضين ومقتنعون بذا الاختيار .

Introduction

Caesarean section rate has increased in the last few decades. This increase is not applicable only to the developed world [1]. The developing countries are also following the same trend [2], which is quite obvious at the national level [3]. Applying anesthesia for C-section is a unique practice in that, the anesthesiologists have to be responsible for the care of both the mother and her unborn baby at once. Many factors play a role in choosing the type of anesthesia for caesarean section. In Kurdistan region, anesthesiologist experiences, the type of anesthetic available and maternal preference (to some extent) are the major factors that determine the type of anesthesia for cesarean section added to other basics like the indication of the operation, any coexisting medical problems and the urgency of operation. Historically, General anesthesia (GA) is the most dependable type of anesthesia for cesarean section worldwide [4]. However, the developments of new medications and devices have illustrated a big change in the current practice [5]. Globally, almost the agreement is towards using the regional anesthesia in obstetric anesthesiology and the huge drop in the use of GA in this field over the last few decades is the best evidence. However, according to our knowledge, a high percentage of cesarean sections in Kurdistan are still to be performed under GA especially in the hospitals of rural area.

Unconsciousness, adequate analgesia, and muscle relaxation are mandatory components for successful GA. It all depends on the type of induction, maintenance and opioids used. To be ideal, the drug used for induction in CS must possess a license for use and reasonable cost. It has to be easily

administered with fast action, obvious end-point, dose flexibility, good safety profile on cardiovascular system with low potential for adverse effects on both the mother as well as her baby and should be used by expertise individuals only. No drug possesses all these characteristics. Available evidence indicates the presence of controversy in choosing the most reliable anesthetic agent [6,7]. An agent with fast recovery profile is beneficial for maintenance purpose. This survey aimed to investigate the type of drugs used for induction and maintenance of GA in CS according to the current practice in Kurdistan region at the north of Iraq.

Materials and Methods

After approval by Scientific and Research Committee of Pharmacy College at University of Duhok (UOD) in January 2015, The survey sent to all members of Kurdistan Anesthesiologists' Association. The information collected by receiving a hard copy of the questionnaire upon completion. This survey includes questions investigating the current practice of GA in the obstetric field as documented in Appendix A with demographics of respondents (which is not declared in this article) placed primarily. In addition to the demographics of responders, the highlighted issues include the drugs choices for induction and the rationale behind it, preferred drug choices for maintenance, the postoperative use of opioids as an analgesic and the routine use of TAP/ilioinguinal blocks for GA LSCS if there is no epidural. The opinion was invited about supporting a change to another drug as the induction agent of choice for caesarean section. The questionnaire was derived from another study with modification to fit current national practice [8].

Results

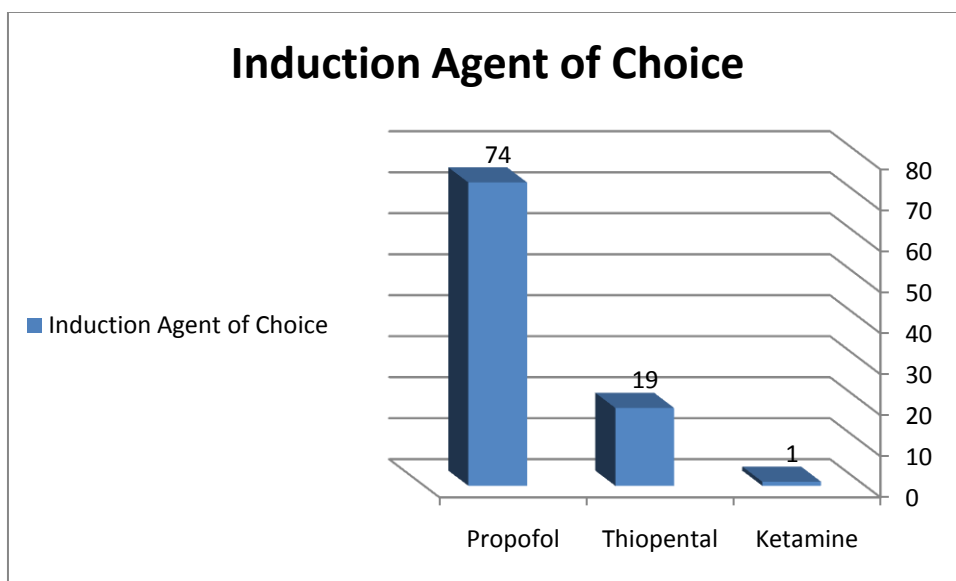


Figure 1: Commonly used induction agents for GA in CS

Invitations were sent to all members of Kurdistan Anesthesiologists' Association (n=163), the response rate was 58 % (n = 94). The main induction agent that is used by most of the anesthetics in Kurdistan was propofol to give a usage rate of 79% (n = 74) as shown in figure 1.

The others (20%, n = 19) are using thiopental with only one respondent preferring the use of ketamine. The majority of respondents are using propofol due to its faster recovery effects (81%, n = 60) and antiemetic properties (69%, n = 51).

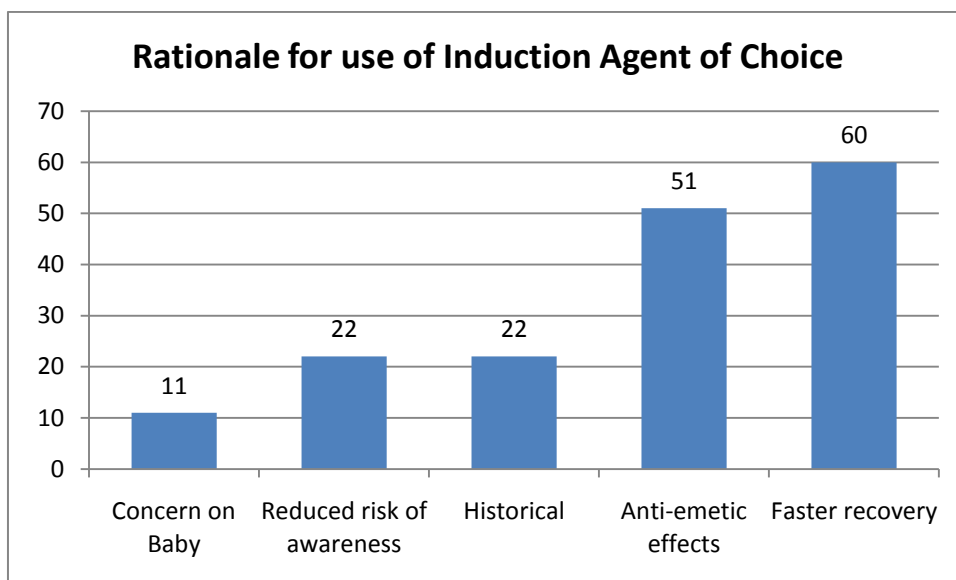


Figure 2: Rationale for the use of induction agent of choice

Other main reasons for using propofol include the historical use and reduced risk of awareness (n = 22 for each one). Few of the respondents stated concerns over effects on the baby, the number of answers are more than the sum of respondent as multi-answer questionnaire technique was used (Figure 2). About 90% (n = 85) of the respondents do not support the change to another induction agent. About 80% use their drug of choice (which has been used for CS) in

other surgeries outside obstetric in a daily manner. Hence, propofol is the most usable one outside obstetric. 79% of respondents (n = 74) prefers to use TAP blocks as postoperative analgesia if possible. For the maintenance phase of GA in CS, Isoflurane is the main inhalational agent being used (56%, n = 53), to be followed by halothane (36%, n = 34) while only seven percent of respondent use sevoflurane (Figure 3).

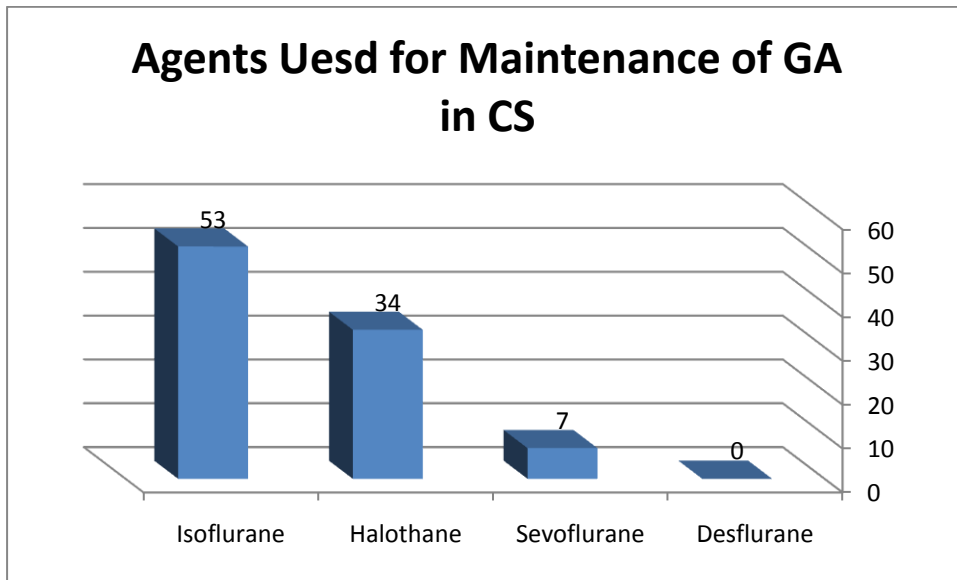


Figure 3: Depended drugs for maintenance of GA in CS

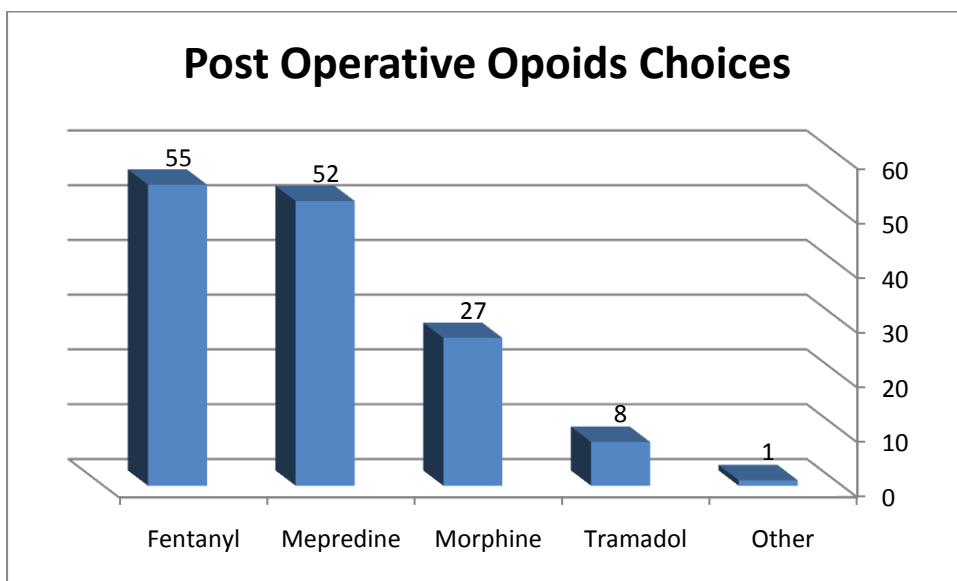


Figure 4: Opioids use for analgesia postoperatively

Nevertheless, the percentage of use for sevoflurane will be increased to 86% (n = 81) if financial constraints withheld. The routinely used opioids for GA in CS (postoperatively) are fentanyl (38% n = 55), pethidine (36%, n = 52) and morphine (19%, n = 27). Only a few of

respondents may use tramadol (figure 4). Near (90%) do not support a change to another drug to be used for induction in obstetrics. Most of the respondent anesthesiologists perform obstetric GA or obstetric regional block daily or weekly on average as shown in Table 1.

Table 1: Average of Obstetric GA and Regional Block

Method	No.	%
Obstetric GA average		
Daily	46	(48.9%)
Weekly	36	(38.3%)
Monthly	9	(9.6%)
> one/month	3	(3.2%)
Total	94	(100%)
Obstetric regional block average		
Daily	32	(34%)
Weekly	43	(45.7%)
Monthly	10	(10.6%)
>one/month	9	(9.6%)
Total	94	(100%)

Discussion

Over the last few decades, there was an obvious move and development in the obstetric anesthesia worldwide. Many factors play a role in deciding the type and technique of anesthesia to be used. Each case must be individualized based on the available anesthetic, obstetric, or fetal risk factors (elective or emergency) and most importantly are the preferences of patient and anesthesiologist opinion. The regional anesthesia is more preferred than general anesthesia in case of cesarean deliveries according to most unless all the international guidelines for obstetric anesthesia [9]. Despite this fact, general anesthesia may be the sole option for certain occasions such as fetal bradycardia, severe bleeding, ruptured uterus, severe placental abruption, life-threatening fetal compromise as well as failed or contraindicated regional anesthesia. However, the mentioned conditions are not the cause behind the

relatively high tendency for using GA for CS in Kurdistan. The actual causes could be the non-constant supply or wobbling availability of the equipment and techniques for regional anesthesia and the level of practice of the responsible anesthesiologist as there are no robust mechanisms for following the update in clinical practice guidelines or development in practice care [10-12]. The best evidence for this fact is the higher proportion of CS to be done under GA in a rural area as compared to an urban setting where more specialized and well-equipped hospitals available (13). This study didn't aim to highlight or promote one anesthetic technique to another. It is designed to show the view of anesthesiologists and current practice regarding the most widely used medication for induction, maintenance and pain control during GA for CS at the national level. The classical anesthetic agent for induction in CS is thiopental. It

has been routinely used since the 1930s. In one survey in the UK, it was the chosen drug for induction in CS where 93% (n = 653) of the anesthesiologists were using it [8]. However, thiopental has some disadvantages, including a reduction in arterial pressure of mother [14]. Its use has been fallen in many countries [15,16]. In our survey, only 19% (n = 20) of the respondents using thiopental with the majority (79%, n = 74) prefers to use propofol. The rationale for using propofol as stated by most of the respondents is the antiemetic effect it possesses & the achievement of faster recovery as compared to an alternative agent. Those were also the main two causes behind the high popularity of propofol use as stated in another study [17]. In this survey, more than one response is allowed to be chosen by respondents regarding the rationale for the use of the induction agent of choice. Eighty-one percent of respondents stated faster recovery time as the main reason for using propofol (n = 60). In one single blinded randomized clinical trial which was done by Janat et al., in 2015, the effects of propofol and thiopental were compared during emergency CS looking to maternal peri-operative outcomes including recovery time [18]. Propofol group was associated with significantly shorter mean recovery time (25.1 min) compared to thiopental group (31.4 min) at $p < 0.005$. The anti-emetic effects of propofol are the 2nd most important cause for its use by 69% of respondents (n = 51) in this survey. Indeed, the antiemetic effect of propofol is well documented in obstetric as well as in non-obstetric anesthesia as confirmed by many studies worldwide [18, 19]. Propofol possesses a direct antiemetic action although the exact mechanism is still unknown [20].

Propofol in its ampoule form is also easier to administer as compared to the much more time-consuming preparation of thiopental vial. Even if premade thiopental vial is used, the shorter time of stability is another barrier.

Furthermore, the available evidence about the effects of propofol on Apgar scores at 1 & 5 minutes is controversial and may be overwhelmed by much updated studies which show no differences in effects between the two induction agents. In 1989, a study was done by Celleno et al. demonstrated a lower Apgar scores for mothers receiving propofol compared to thiopental [21]. Another study was done in the same year by Capogna et al., highlighted the lack of difference in Apgar scores between the two agents [22]. Whereas another study in the year 1991 indicated lower Apgar scores for neonates of propofol received mothers as compared to thiopental, this was at 1 minute but not for 5 minutes. Nevertheless, the neurobehavioral status at 1, 4 and 24 h was not different [23]. There were no differences between propofol and thiopental in other related studies from the same period [24-26]. The most up to date evidence indicate a lack of significant difference is the effects on Apgar scores between propofol and thiopental as stated by one randomized clinical trial from Uganda [14]. Hence, available data may justify the higher usage rate of propofol, although, the real reason for these higher preferences for using propofol could be mostly related to the availability of the product merely.

The commonly used inhalational agents for maintenance of anesthesia in Kurdistan region are halothane, isoflurane, sevoflurane and rarely desflurane. Despite the clear advantages of sevoflurane over the others, Isoflurane is the most commonly used inhalational agent (56%, n = 53) according to our survey. Halothane is less commonly used (36%, n = 34) and only seven percent of the respondents (n = 6) using sevoflurane. This figure is unlike that of UK according to a survey for obstetric anesthetic done by Murdoch, Scrutton and Laxton in 2013 [8]. In that survey for UK practice, sevoflurane was the most common inhalational agent being used by 53% of respondents followed by isoflurane and desflurane. A similar survey in China

indicated that sevoflurane was also the most popular inhalation agent for GA in CS [27]. The higher usage rate of Isoflurane in our survey is mostly due to its availability which is intern related to its lower cost as compared to sevoflurane. The best evidence for this is the probable increase in usage rate of sevoflurane to be 86% (n = 81) if financial constrains withheld. The high tendency for the use of sevoflurane for maintenance compared to other agents is its favorable profile including smoother induction and faster recovery. Also, the complication is low as compared to other agents thathave led to better patient compliance and good acceptance [28,29]. Opioids are commonly used for its analgesics action postoperatively for pain management in CS. The systemic administration through intravenous route is the most dependable way to Kurdistan region. Fentanyl (38%) and meperidine (36%) are the most commonly used opioid with morphine also being used but less commonly (18%). Fentanyl appears to have less emetic activity than morphine and meperidine.

However, as for other developing countries, drug availability (especially in the governmental hospital), resource limitations and financial consideration are the major determinants for opioids selection. In one study in Pakistan and other in South Africa, meperidine was the main opioid analgesic to be used post-delivery for GA in CS [30, 31]. In 2001, Dr. Rafi first time introduced Transversus Abdominis Plane (TAP) block [32]. TAP block was then well developed by McDonnell et al, in 2008 to be widely used by anesthesiologists nowadays for its aid in reducing the need for analgesia and hence avoiding further side effects [33,34]. Nevertheless, there are conflicting results from two studies done about the effects of TAP block on post-CS patients [35,36]. In our survey, about 79% of respondents (n = 74) prefers to perform TAP block (if they have the optimum skill and equipment) which is higher percentage as compared to the

survey of UK practice where only 37% of respondents did. However, this lower percentage in the UK survey constitutes 260 respondents.

The anesthesiologists in this survey were asked to give their opinion about supporting the change to use another induction agent for general anesthesia in CS. Ninety percent (n = 85) disagree and they were satisfied with their induction agent of choice. It is especially true for propofol users where 96% (n = 71) of them refuse the change. On the other hand, in the survey of obstetric anesthesia practice in China, most of the anesthesiologists (82%, n = 535) would support the change to propofol [29]. Also by considering the 60% (n = 419) of respondents from the UK survey who also gave their opinion for propofol use. And by knowing that propofol is being the agent of choice for GA in most of the large obstetrics centers in the USA [8]. There will be an international body of evidence supporting the use of propofol for induction of GA in CS. This agreement may be violated by the fact that propofol use for this purpose is off-label as the product is unlicensed to be used for induction of anesthesia in CS. However, this is not a rare action. Actually "off label" medication use is quite common in medical practice at the national level as well as globally. Nevertheless, being a common action is not justification for such practice. The ideal solution could be to start a serious attempt to study the probability of approving the use of propofol as an induction agent for CS officially worldwide.

Conclusion

The drug of choice for induction of obstetric anesthesia according to current national practice is propofol as collected by this survey. Anesthesiologists do not support the change to another agent, and they are fairly satisfied with their choice. But this choice may be guided by other than medical indication like drug availability in the market and ministry of

health. For the maintenance of anesthesia, anesthesiologists preferred isoflurane. However, they will change to sevoflurane if its financial press gets less. For analgesia, they were using variety

different intravenous narcotics in nearby averages, but most of them support nerve block (TAB) as analgesia if they gain sufficient skill and equipment.

List of Abbreviations

CS	Caesarian Section
G	General Anesthesia
LSCS	Lower (uterine) Segment Caesarean Section
TAB	Transversus Abdominis Plane
UK	United Kingdom
UOD	University of Duhok

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Appendix

Research Questionnaire

Anesthetic for Cesarean Section: Current Practice in Kurdistan Region-Iraq.

Part A: Demographic Data

Specialist Name or Essentials:

Degree(s) & Qualification:

Date of Graduation from college (For basic degree)

Date of getting post graduate degree (Specialty)

Years of experience as anesthesiologist:

Current position:

Work type: Please underline

Governmental

Private

Both

Part B: Choice of anesthetic agents for obstetric general anesthesia

(1) What is the drug do you use routinely for induction of GA LSCS?

Thiopental

Propofol

Other

If other please specify:

(2) The cause of choosing the specified drug?

Tick all that apply

Historical

Reduced risk of awareness

Concerns over effect on baby

Antiemetic properties

Faster recovery

Other (please expand in comments box)

Comments:

(3) Would you support a change to another drug as the induction agent of choice for caesarean section?

Yes (give the name of drugs)

No

(5) How often do you use your choice induction drug outside obstetrics?

- Daily
- Weekly
- Monthly
- Never/hardly ever

Additional Comments

(7) Assuming the absence of a functioning epidural, what opioids do you use routinely, post-delivery, for GA LSCS?

- Tick all that apply
- Alfentanil
- Fentanyl
- Morphine
- Meperidine
- Other

If you ticked 'other', please comment

(8) Assuming the absence of a functioning epidural, do you routinely use TAP/ilioinguinal blocks for GA LSCS?

- Yes
- No

Additional Comments

(9) What inhalational agent do you use most commonly for maintenance of anesthesia for GA LSCS?

- Halothane
- Isoflurane
- Sevoflurane
- Desflurane
- Other

If you ticked 'other', please use comment box to expand

(10) What would be your preferred choice of theinhalational agent if not subjected to financial constraints?

- Halothane
- Isoflurane
- Sevoflurane
- Desflurane
- Other

If you ticked 'other', please use comment box to expand

(11) How often do you perform an Obstetric GA on average?

Daily

Weekly

Monthly

Less than once per month

Additional Comments

(12) How often do you perform an Obstetric regional block on average?

Daily

Weekly

Monthly

Less than once per month

Additional Comments