Ambulatory anaesthesia in the Netherlands: a survey of practise

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Abstract

We conducted a survey on anaesthesia practise for ambulatory surgery in The Netherlands with the purpose of identifying patterns and comparing them to published recommendations. Overall response rate was 69%. 97% of Dutch hospitals have ambulatory wards and 25% have dedicated operating rooms. Preoperative anxiolytic use is relatively high, approximately 40%. Prophylactic anti-emetic use is low, 33% for laparoscopic cholecystectomy, but a further 33% of patients require rescue treatment. Combination analgesic use is infrequent, with just one analgesic being used in more than 50% of patients. There is a strong preference for both locoregional, 85% for upper limb surgery, and neuroaxial techniques, 65% for lower limb surgery. However, use of continuous peripheral nerve block catheters for pain control following discharge is limited. We conclude that closer adherence to guidelines on PONV prophylaxis and greater use of multimodal approaches to pain management would be beneficial.

Keywords: survey, day case, anaesthesia, ambulatory, PONV, locoregional.

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Introduction

The past decade has seen an enormous increase in the both the number and type of procedures performed in the ambulatory setting. Vast improvements in the development of both anaesthetic and surgical techniques, allow a growing number of patients with poorer health status to have more complex procedures performed on an ambulatory basis [1, 2].

Despite an increasing amount of research focusing on ambulatory anaesthesia techniques, there are few publications reporting everyday patterns of practise and how these relate to published recommendations. Indeed, earlier publications in individual countries have confirmed that wide variation in practise exists [3, 4]. Thus, the purpose of this survey was to record variations in ambulatory anesthesia practise in the Netherlands and compare the findings to published evidence, highlighting potential areas for development.

Methods

Following local ethics committee guidelines, we designed a structured questionnaire consisting of a series of closed questions concerning various aspects of ambulatory anaesthesia practise. (See Appendix 1). A number of questions were based on similar previous surveys in other countries [4, 5].

The survey was posted to the 101 hospitals throughout The Netherlands, with a cover letter requesting that the questionnaire be completed by the anaesthesia consultant with main responsibility for ambulatory practise.

Four specific types of surgery were listed i.e. Dupytren's release (plastic surgery), knee arthroscopy (orthopaedic surgery), laparoscopic cholecystectomy (general surgery) and paediatric circumcision (paediatric surgery). Dupytren's release and knee arthroscopy were choosen as they are relatively frequent in the ambulatory setting. Paediatric circumcision was choosen as representative of paediatric ambulatory practise. Laparoscopic cholecystectomy was included as it is an emerging procedure in our ambulatory practice, presenting new challenges in terms of analgesic control and PONV prevention. The survey questions covered the following areas; general information on ambulatory unit set up, premedication, anti-emetics, induction and maintenance drugs, airway management, analgesic drugs and locoregional/neuroaxial techniques.

Where hospitals indicated that they did not perform a particular type of surgical procedure, then only those who did perform it were used for calculations. In the event that answers were illegible, results were discarded and calculations based on the total minus these discarded answers. Where more than one response was given in situations requiring a single response, the response was weighted by the number of responses offered.

Results

General information

71 of the 101 quesionnaires were returned. Two had not been completed, giving an overall survey response rate of just over 69%. 25% of respondents stated that their hospital had dedicated ambulatory operating rooms (n=69) and 97% of respondents stated that their hospital had dedicated ambulatory wards (n=69). Distribution of day case patients based on ASA classification was as follows; ASA 1: 62%, ASA 2: 31%, ASA 3: 7.3% (n=62). Concerning specialities working in ambulatory practise; plastic surgery made up 11%, orthopaedic surgery 31%, general surgery 27% and paediatric surgery 21% of the total ambulatory surgical procedures in the hospitals that responded. The average duration of a day case surgical procedure was 39 minutes (95% CI: 35.5- 43.08 minutes, n=57).

Use of anxiolytic premedication

Anxiolytics were administered as follows; 39% for Dupytren's release (n=56), 41% knee arthroscopy (n=61), 37% laparoscopic cholecystectomy (n=54) and 24% for paediatric circumcision patients (n=55). Distribution of anaesthesia techniques used for each procedure is listed in Table 1.

Table 1 Anaesthesia technique.

Anaesthetic technique	Dupuytren's release (n=68)	Knee arthroscopy (n=68)	Laparoscopic cholecystectomy (n=60)	Paediatric circumcision (n=67)
GA	16	20	98	18
RA	82	15	0	0
NA	0	64	0	<1
GA-RA	1	<1	<1	64
GA-NA	< 1	<1	<1	17

n is number of completed responses. Values are percentage of respondents. GA = general anaesthesia, RA = regional anaesthesia, NA = neuroaxial anaesthesia, GA-RA= combination of general and regional anaesthesia, GA-NA = combination of general and neuroaxial anaesthesia

Use of anti-emetic premedication.

The most frequently used anti-emetics in Dutch ambulatory practise are 5H3 antagonists (granisetron and ondansetron), metoclopramide and dexamethasone. Antiemetic use by procedure is found in Figure 1. Other PONV-limiting techniques used include; avoiding N2O (61/69), TIVA (60/69), no opioids (7/69), others (24/69) e.g. opting for regional anaesthesia blocks.

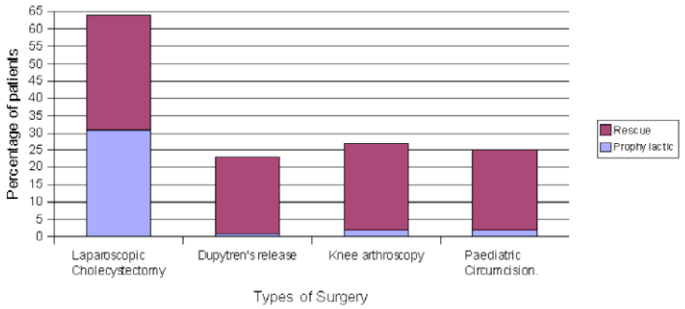

Figure 1 Anti-emetic use for the procedures listed. Total height of bar is percentage of patients who receive either prophylactic or rescue anti-emetics.

Named anesthetic agents and airway devices used are found in Tables 2 and 3, respectively.

Muscle relaxants

Muscle relaxants are used for laparoscopic cholecystectomy in 90% of cases (n=57), knee arthroscopy 11% (n=67), Dupytren's release 6% (n=64) and paediatric circumcision 1% (n=66). The 2 most commonly used muscle relaxants are rocuronium (43%) and mivacurium (38%). The percentage of cases rountinely utilizing suxamethonium is 2% in adults and 4% in paediatrics.

Table 2 Named anaesthesia induction & maintenance agents.

Agent	Adult (n=173)	Paediatric (n=64)
Propofol (I)	90	24
Sevoflurane (I)	2	73
Etomidate (I)	3	2
Midazolam(I)	2	1
Thiopentone (I)	2	0
Halothane (I)	0	0
Ketamine (I)	0	0
Other (I)	1	0
Sevoflurane (M)	61	95
Propofol (M)	33	5
Isoflurane(M)	3	0
Desflurane (M)	2	0
Enflurane (M)	0	0
Halothane(M)	0	0
Other (M)	1	0

n is number of completed responses.
Values are percentages. I = induction, M = maintenance.

Analgesics

Short acting opioids are the most frequently used analgesics with sufentanil being the most popular. The use of the NSAID, diclofenac is low, at just 8% and 7% respectively for Dupytren's release and knee arthroscopy. Full results are given in Table 4.

Table 3 Airway devices used.

	Dupytren's release (n=56)	Knee arthroscopy (n=63)	Laparoscopic cholecystectomy (n=56)	Paediatric circumcision (n=65)
LMA	92	96	96	71
ETT	3	2	2	2
Face mask	3	2	2	27
Other	2	0	0	0

Table 4 Named analgesics and number of combined analgesic.

Named analgesics/ combination analgesics	Dupytren's release (n=62)	Knee arthroscopy (n=68)	Laparoscopic cholecystectomy (n=57)	Paediatric circumcision (n=65)
None given	3	0.5	0	12
Alfentanyl	19	16	5	18
Diclofenac	8	7	5	5
Fentanyl	17	19	16	23
Morphine	2	2	4	3
Piritamide	0	0.5	3	1
Remifentanil	10	8	22	3
Sufentanil	38	43	44	33
Other	3	4	1	2
1 analgesic	58	62	53	71
2 analgesics	23	27.5	25	15
3 analgesics	8	7	9	3
4 analgesics	5	3	7	3
5 analgesics	3	0	4	0
6 analgesics	0	1	2	0
No analgesic	3	0.5	0	8

n is number of completed responses. Values are percentages.

Regional techniques

Locoregional blocks are most frequently performed in the holding area/reception (68%), followed by 21% in the operating room and the remaining 11% in the anaesthesia induction room. The most commonly used blocks for Dupytren's release are axillary block (35%) and Bier's block (34%) (n=67). Other upper limb blocks that were used include vertebral infraclavicular block (VIB) 26%, wrist 2%, interscalene 2%, elbow <0.5% and PIPA <0.5%.

Just 12 centres performed knee arthroscopy under locoregional anaesthesia. The most common block was a combined femoral/ sciatic (70%), followed by sciatic/psoas (25%). Penile blocks are administered for children undergoing circumcision in 62% of cases (n=67). The most popular local anaesthetics for regional blocks are listed in table 5. Additives are not combined with local anaesthetic agents for locoregional techniques in 49 of the centres that responded. The remaining centers use one or more additives, most commonly, adrenaline (n=20) and opioids (n= 10), with clonidine and bicarbonate use in just 5 and 1 centre respectively.

Neuroaxial blocks

Where a neuroaxial technique is used for knee arthroscopy, it is most commonly a spinal (66/68). In 2 of 68 centres, a combined spinal/epidural technique is used. Neuroaxial techniques are occasionally used for laparoscopic cholecystectomies with 5 of the responding centres using spinals and 4 using epidurals. For paediatric circumcision, caudal anaesthesia is used in 42 of the 45 centres which responded. Local anaesthetic agents for neuroaxial techniques are listed in table 5. 48 of the responding centres do not use additives to local anaesthetic drugs for spinal anesthesia. Continuous peripheral nerve blockade is offered by 2 of the 69 ambulatory surgery centres that responded.

Table 5 Named local anaesthetic agents for locoregional and neuroaxial anaesthesia blocks..

Local anaesthetic agent	Locoregional techniques (n=69)	Neuroaxial techniques (n=68)
Lidocaine	23	36
Bupivcaine	23	27
Ropivacaine	20	4
Mepivacaine	15	4
Prilocaine	13	7
Levobupivacaine	3	4
Other	3	18

n is number of completed responses. Values are percentages.

Discussion

To our knowledge this is the first national survey in the Netherlands looking specifically at aspects of ambulatory anaesthesia practise. The purpose of the survey was to identify current practise and compare the findings with published evidence. A response rate of 69% was achieved. This response rate is similar to previous studies in other countries [3, 4, 5].

97% of Dutch hospitals have dedicated ambulatory wards, an important factor for ensuring efficient pre- and pos -operative patient review. Interestingly, only a quarter of responding Dutch hospitals have dedicated ambulatory operating rooms. This is a low figure, considering the contribution which logistics and organizational

factors make to the successful running of such units. It is widely recognised that mixed inpatient and day case lists do not achieve the same level of care as dedicated day case lists [6]. Another advantage of a dedicated pracice is the availability of specialized staff with an interest in developing and advancing techniques.

An interesting finding is the frequent use of anxiolytic premedication, administered to approximately 40% of adult patients and almost 25% of paediatric patients, compared to just 12% of orthopaedic patients and 6% of urology patients in the UK in 2000 [4]. While this may be related to cultural differences, it does suggest a need for more optimal psychological preparation of patients within the Dutch system. It must however be noted that, a reluctance to offer anxiolytic premedication on the basis that it may delay patient discharge has not as yet been supported by the literature [7].

One of the most important findings in this survey is the large percentage of patients who require rescue or treatment anti-emetics (Figure 1), 33% for laparoscopic cholecystectomy and approximately 25% for each of the other procedures listed. This clearly demonstrates that a significantly greater number of patients would benefit from prophylactic administration of anti-emetic medication. Given that PONV continues to be one of the biggest challenges in modern anaesthesia practise, with an incidence as high as 70% in certain high-risk patients [8], closer adherence to prophylactic anti-emetic administration guidelines is indicated. In addition to delaying patient discharge and increasing costs, PONV contributes to low patient satisfaction scores [9]. The optimal cost-effective approach to the management of PONV differs between an ambulatory and an inpatient setting [11]. Anti-emetics should be administered to those with a moderate to high risk of PONV; a combination of a 5-HT3-antagonist and one other agent such as dexamethasone is probably the best combination available at this time [11,12]. Other potential PONV reducing maneuvers may include avoidance of N20, adequate hydration and use of locoregional techniques.

Regarding airway management, the LMA is not surprisingly extremly popular, used in more than 90% of cases. A possible emerging trend is the use of the LMA for laparoscopic cholecystectomy, in this survey reported in 2% of cases. Recent publications have reported the safe use of LMAproseal devices, as an alternative to the ETT in carefully selected patients undergoing laparoscopic procedures [13, 14].

Analysis of pain management displays some key points. Firstly, the short acting opioids have largely replaced the longer acting opioids. Remifentanil, with its rapid elimination profile, is now used in 20% of centres. Most surprisingly, combination use of analgesic drugs is limited (Table 4). Only approximately one fifth of centres combine 3 or more analgesics in patients undergoing laparoscopic cholecystectomy. Given the known syngeristic effects of certain analgesic combinations [15], this highlights a significant under-use of an important tool in pain management.

This survey confirms the popularity of locoregional techniques within the Dutch system. Such techniques have been shown to provide competitive discharge times, prolonged analgesia and reduced requirement for opioids [16,17,18]. An additional advantage is that more rapid patient 12 turnover can be achieved when blocks are performed outside the operating room [19]. The use of longer acting agents in the home setting has not been shown to increase risk [20, 21] and ropivicaine is now used in 20% of Dutch centres. However, the number of hospitals offering continuous peripheral nerve blockade catheters is currently very limited. Such techniques have been shown to provide safe and effective analgesia following ambulatory surgery [16, 21, 22] and allow more complex and painful procedures to be performed in the ambulatory setting.

Despite known disadvantages, including urinary retention and the risk of developing transient neurological symptoms (TNS) [24], neuroaxial techniques are popular among the units surveyed. Selective spinal anesthesia (SSA), using minimal doses of intrathecal agents may be a useful option[26].

In conclusion, this survey provides interesting data on ambulatory anesthesia practise within the Netherlands, although we believe that many of the trends may be applied to ambulatory practise particularly within other European countries. The main findings include a clear recognition of the benefits of the newer anaesthesia agents in combination with LMAs. A multimodal approach is used in the prevention of PONV, but closer adherence to recommended guidelines for prophylactic administration of anti-emetics is indicated. Finally, in terms of pain management there is clear room for further expansion of the role of analgesic combinations and continuous peripheral nerve block catheters.

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