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ORIGINAL ARTICLE

A cross-sectional survey of anaesthesia-related expectations amongst patients awaiting upper limb trauma surgery*

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Abstract

Background and aims: Little is known regarding patients' anaesthesia-related expectations when presenting for upper limb trauma surgery.

Methods: We conducted a prospective cross-sectional survey exploring prior anaesthetic experience, anaesthesia-related knowledge, anaesthesia expectations, the preoperative visit and factors likely to influence anaesthesia choice. The survey was completed by 192 patients.

Results: Anaesthetists were identified as doctors by 52%; 53% were unaware of their planned anaesthesia; 58% indicated likely acceptance of regional anaesthesia. Information regarding anaesthesia originated mostly from surgeons (65%); 93% had not seen an anaesthetist at the time of the survey. Most believed anaesthesia involved 'going to sleep' (82%) and 71% expected to receive general anaesthesia. The preoperative anaesthesia visit was rated as important by 65% of patients. 78% indicated that provision of information would increase the likelihood of accepting regional anaesthesia. Reducing postoperative pain and nausea would influence 80% in choosing a regional technique.

Conclusion: A knowledge deficit exists regarding anaesthesia modalities for upper limb trauma surgery.

Keywords: patient expectations; anaesthesia, general, regional; upper limb trauma surgery; postoperative analgesia; survey

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Introduction

Regional anaesthesia has several benefits when compared to general anaesthesia for patients undergoing upper limb trauma surgery. These include improved peri-operative analgesia [1], reduced opiate consumption [2], reduced post-operative nausea and vomiting [3], shorter recovery room stay [3], and earlier hospital discharge [4]. Despite reported advantages, factors such as a perception of operating list delay [5], limited training in regional anaesthesia [6] and unproven benefit to outcome measures such as mortality [7] limit the use of regional anaesthesia in upper limb surgery. In translating the proven benefits of regional anaesthesia into everyday clinical practice these barriers must be addressed.

Importantly, none of these considerations include the role of the patient as an active participant in the anaesthesia and surgical process. Patient acceptance is essential to the use of regional anaesthesia in upper limb trauma surgery. Little is known as to patient expectation regarding anaesthesia and analgesia in the perioperative period. There is a paucity of data to assist anaesthetists in preparing patients for upper limb trauma surgery using regional anaesthesia. We designed a prospective cross-sectional survey of patients presenting for operative repair of an upper limb injury. The aim of the survey was to ascertain patient

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expectation and knowledge regarding anaesthetists, anaesthesia and analgesia in the perioperative period and to identify factors that might influence their choice of anaesthesia.

Methods

Institutional Ethics Committee approval was obtained. Patients presenting to the emergency room aged 18-80, American Society of Anesthesiologists grades I to III, with an isolated upper limb injury requiring operative repair were invited to participate in the survey. Exclusion criteria included bilateral or multiple injuries, expected duration of surgery of more than three hours, language or literacy barrier, psychiatric history and pregnancy. A 32-item questionnaire was designed to explore prior anaesthetic experience, knowledge of anaesthetists and anaesthesia, expectations of anaesthesia and analgesia for upper limb trauma surgery, the preoperative anaesthesia visit and factors influencing choice of anaesthesia. The questionnaire was administered to patients scheduled for surgery during normal working hours over an eight-month period.

Patients were identified by the examination of the daily operating list for the trauma orthopaedic and trauma plastic surgery services at 8 am each morning. The investigator then visited the patient in the hospital location recorded on the operating list (emergency room, admission lounge, day care suite or inpatient ward). The investigator was not involved directly in anaesthesia-related patient care. Following a brief description of the purpose of the survey, having obtained written informed consent from each, patients were invited to complete the questionnaire. They were encouraged to complete the questionnaire independently of the investigator, therefore where possible the questionnaire was left with the patient and collected later in the day. Writing assistance was offered to patients with dominant upper limb injury.

Data were analyzed using EpiInfo™ 2002 (Centers for Disease Control and Prevention, USA) statistics software. Normally distributed continuous data were analyzed using the unpaired Student *t* test for samples of unequal variance or one sided ANOVA as appropriate. Non-normally distributed data were analyzed using the non-parametric Mann–Whitney/Wilcoxon two-sample test. Differences in proportions were compared by the Yates Chi-square test. Statistical significance was considered at $p < 0.05$.

Results

Two hundred and twenty three patients were invited to participate in the survey. Thirty-one patients were excluded due to: literacy problems (n = 2); failure of questionnaire completion (n = 12); questionnaire loss (n = 7); language difficulties (n = 3); unknown (n = 7). The survey was successfully completed by 192 patients (86%). The study was conducted during the normal working week (Monday to Friday) from January 14th to May 16th 2008 and from June 23rd to September 26th 2008. The hiatus was due to principal investigator vacation and academic staff turnover.

Patient demographics and data relating to background knowledge are summarized in Table 1.The male to female ratio was 2:1 with females significantly older than males (52.1 (17.5) vs 34.5 (14.4) years [mean (SD)] $p < 0.001$). A greater proportion of females were graded as ASA II or III (42.2% [24-45%] vs 15.6% [7-19%] [95% CI] $p = 0.002$). Only half (52%) of those surveyed correctly identified anaesthetists as doctors, 32% had heard of nerve blocks and 79% had received dental treatment using local anaesthesia.

Responses obtained to questions regarding the anaesthesia preoperative visit and patient expectations are summarised in Table 2. Of note 66% expected to see the anaesthetist prior to surgery and 65% rated the anaesthesia preoperative visit as important. However an anaesthetist had visited only 7% of respondents at the time of the survey. Importantly 78% indicated that information regarding regional anaesthesia would increase the likelihood of acceptance of this modality of anaesthesia. With regard to anaesthesia-related expectations, 82% envisaged 'going to sleep' for surgery, 71% anticipated receiving 'general anaesthesia' while only 47% were made aware of the type of anaesthesia they would receive. Surgeons were the most commonly reported information source regarding anaesthesia (65% combined consultants and trainee staff). As to the question regarding willingness to have surgery performed under peripheral nerve block, 58% responded positively. Of those who responded negatively the most common reasons were: 'want to be asleep' 31%; 'don't like the idea' 25%; 'don't want to hear the operation' 20%. Considering patient expectation regarding postoperative analgesia, 84% indicated that pain was to be expected and tolerated as part of the recovery process and 52% reported expecting moderate to severe pain following surgery. Postoperative nausea and vomiting was expected to be mild or absent in 88% of cases. Pain-free and nausea-free recovery would influence anaesthesia choice in 83% and 79% of respondents.

When informed that regional anaesthesia would provide superior analgesia and reduced postoperative nausea and vomiting compared to general anaesthesia, participants reported that these facts would influence their choice of anaesthesia in favour of regional anaesthesia in 80 and 81% of responses respectively. The

Table 1. Demographics and data relating to baseline knowledge

Age Median [Range]	35 [18-77]	
Gender n (%)	Male 128 (67%), Female 64 (33%)	
ASA Status	I 145 (75.5%) II 38 (19.8%) III 9 (4.7%)	
Question		**'Yes' Response** % (95% CI)
Prior Anaesthesia Experience		
Previous anaesthesia		59% (52-66)
Type of anaesthesia	GA (93%)	
	Local Anaesthesia (5%)	
	Spinal/Epidural (2%)	
Complications attributed to anaesthesia	None (81%)	
	PONV (11%)	
	Other (8%)	
Knowledge about Anaesthetists and Regional Anaesthesia		
An anaesthetist is:	Doctor with specialist training	52% (45-59)
	Technician	19% (14-25)
	Don't know	17% (12-23)
	Nurse with specialist training	7% (4-12)
	Surgeon in training	5% (3-9)
I learned about anaesthesia from	Anaesthetists	23% (18-30)
	Other	22% (16-28)
	TV	18% (13-24)
	Word of Mouth	16% (11-22)
	Nurses	10% (7-16)
	Surgeons	7% (4-12)
Are you aware that you could have your procedure performed by making your arm numb?		45% (38-52)
Have you heard of nerve blocks or regional anaesthesia?		32% (26-39)
Have you been to the dentist and had a procedure using local anaesthesia?		79% (72-84)

ASA = American Society of Anesthesiologists; CI = Confidence Interval; GA = General Anaesthesia; PONV = Postoperative Nausea and Vomiting

reported desired level of sedation for regional anaesthesia was 47% for deep sedation and 43% for light or no sedation. Significantly more male than female patients were willing to undergo regional anaesthesia without sedation (31% [23-39%] vs 8% [3-17%] [95% CI] p = 0.001).

Discussion

This survey highlights an important anaesthesia-related knowledge deficit amongst patients presenting with upper limb injuries for anaesthesia and surgery. This is exemplified by the lack of awareness that anaesthetists are physicians; a fact that is mirrored by an earlier report [8]. Anaesthetists work in a geographical space remote from the 'coal-face' of the emergency room, outpatient suites and inpatient wards. Therefore, anaesthetists may not be as visible or accessible within the hospital environment as other physician groups.

Operating room demands frequently interfere with the anaesthetist's ability to visit patients preoperatively during dynamic and ever-changing trauma lists. This is reflected in the low number of respondents who received a preoperative visit from an anaesthetist prior to our survey (7%). This may result from a sampling bias as due to the timing of the survey distribution. This phenomenon may otherwise be explained by the relatively young, healthy patient population (median age 35 [17-77] and 75% ASA 1). In this context, anaesthetists may have chosen to assess patients in the preoperative area of the operating theatre complex rather than on the ward. Irrespective of the reason, increasing the number of preoperative visits by anaesthetists will

Table 2. The preoperative visit and patient expectation

Question		'Yes' Response % (95% CI)
The Preoperative Visit		
Do you expect to see your anaesthetist prior to surgery?		66% (59-73)
Is it important to see your anaesthetist prior to surgery?		65% (59-73)
Have you had the opportunity to discuss anaesthesia with an anaesthetist?		7% (4-12)
A visit from my anaesthetist will:		
	Answer questions	92% (87-95)
	Reduce fear	90% (85-94)
	Increase satisfaction	89% (83-93)
The provision of information would increase the likelihood of acceptance of nerve block anaesthesia.		78% (72-84)
Expectations Regarding Anaesthesia for Upper Limb Surgery		
Would you be happy to have your procedure performed using a nerve block?		58% (51-65)
Those unhappy (n = 81) indicated why:		
	'Want to be asleep'	31% (21-43)
	'Don't know, don't like the idea'	25% (16-36)
	'Don't want to hear the operation'	20% (12-30)
	'Fear of pain'	16% (9-26)
	Other	8%
When you think of anaesthesia what do you imagine?		
	'Go to sleep'	82% (76-87)
	'Have numb arm'	11% (7-16)
	'No thoughts or expectations'	7% (4-11)
What anaesthesia do you expect?		
	'General Anaesthesia'	71% (64-77)
	'Nerve Block'	8% (4-13)
	'Combination of both'	4% (2-9)
	'No thoughts or expectations'	17% (12-23)
Have you been told what type of anaesthesia you will receive?		47% (40-55)
If so, who informed you as to the type of anaesthesia you will receive? (n = 91)		
	Surgeon	40% (30-50)
	Surgical resident	25% (17-36)
	Nurse	25% (17-36)
	Anaesthesiologist	10% (5-18)
Expectations regarding postoperative analgesia, nausea and vomiting		
Do you consider pain to be expected and tolerated as an integral part of the recovery process after surgery?		84% (79-89)
What level of pain do you expect after surgery?	None	6% (3-11)
	Mild	42 % (35-50)
	Moderate	44% (36-51)
	Severe	8% (5-13)
Would the ability to provide pain-free recovery influence your choice of anaesthesia?		83% (77-88)
What level of nausea and/or vomiting do you expect after surgery?	None	46% (39-54)
	Mild	42% (35-49)
	Moderate	10% (6-15)
	Severe	2% (0-5)
Would the ability to provide recovery free of nausea and vomiting influence your choice of anaesthesia?		79% (73-85)

help disseminate appropriate anaesthesia-related information and facilitate the creation of mutually acceptable anaesthetic plans.

Surgeons were reported as the most common source of anaesthesia-related information (65%) with nursing staff next (25%) and anaesthetists in the last place (10%). Worryingly, surgeons have been shown to underestimate the type and quantity of information desired by patients [9] and may not be sufficiently informed to discuss anaesthesia for upper limb trauma surgery. The preoperative anaesthesia visit is thus an extremely important component of anaesthesia care, which provides patients with an opportunity to meet the anaesthetist, gain information, ask questions and make informed choices [10]. Improving patient information has been shown to increase patient satisfaction [11]. A variety of methods of preoperative patient education have been studied including video, information leaflet and direct interview. Combining two educational interventions appears to have a beneficial effect on

patient satisfaction and information gain [12]. In the context of a busy trauma anaesthesia service, a timely, extensive preoperative visit is not always possible. The provision of illustrated anaesthesia-related information in booklet form has been shown to be a useful tool in patient preoperative education [13] and may improve patient education in this setting.

When asked to describe what they thought of when considering anaesthesia for upper limb surgery 82% of patients envisaged going to sleep. Obviously, those who wish to go to sleep may receive appropriate anxiolytics or sedation (77% of respondents indicated they would wish to receive light [30%] or heavy [47%] sedation). The provision of appropriate anxiolysis can be discussed and anaesthetic management plan agreed to meet the individual patient needs during a preoperative visit. The preoperative visit also provides an opportunity to address patient fears and provide reassuring information regarding the operating room environment. In particular, our survey indicated that patients were most concerned with hearing the operation and feeling pain during surgery (Table 2). Thus discussing measures taken to ensure patient comfort such as ensuring adequacy of block, creating an environment where surgery is not visible and reducing unnecessary operating room noise may contribute to non-pharmacological anxiolysis.

Our study suggests that most patients (84%) presenting with upper limb trauma expect pain to be tolerated as an integral part of the postoperative recovery process. This is at odds with Hume et al [14] who reported only 39% of patients believing that postoperative pain is something that had to be endured. The difference in pain expectation may be accounted for by the type of planned surgery. Patients presenting for trauma surgery, who have suffered a painful injury, may expect higher pain levels than those presenting for elective urological, general and gynaecological surgery. Despite the expectation of pain in the postoperative period, the results clearly indicate that pain-free recovery would influence patient choice regarding anaesthesia. The avoidance of the complications associated with general anaesthesia has been reported as the primary reason patients preferentially chose brachial plexus anaesthesia for upper limb orthopaedic surgery [15]. Therefore, as indicated by our survey results, information relating to the ability of regional anaesthesia to reduce PONV may similarly influence the anaesthesia choice. Overall, patients' expectations are fast emerging as an important parameter of assessment when studying patient satisfaction [16]. The fulfillment of patients' expectations has been found to be highly correlated with patient satisfaction [17]. Therefore, the importance of managing patients' ideas, concerns and expectations preoperatively cannot be over-emphasized.

This study has a number of weaknesses. Inclusion in the study was limited to the standard working week and may have missed patients admitted for surgery over the weekend. The survey only included patients from the southern region in Ireland presenting for trauma surgery at the regional trauma centre at Cork University Hospital. It is uncertain as to whether these patients are representative of the entire Irish population or upper limb trauma populations internationally. Many of our findings, however, reflect those of similar studies [8, 15].

Our work suggests that patients presenting for upper limb trauma surgery would choose regional anaesthesia if provided with appropriate information to enable them make an informed choice. These findings raise questions regarding how best to educate patients regarding anaesthesia choices prior to upper limb trauma surgery. The results of this study have been used to design and implement a regional anaesthesia service, whereby peripheral nerve blockade is offered around the clock. Due to institutional lay-out and time constraints, to this day most trauma patients are assessed and consented for anaesthesia in the preoperative holding day. They have, however, the opportunity to discuss their anaesthesia and postoperative pain management with the attending anaesthetist. Specifically the concerns expressed by patients not prepared to undergo regional anaesthesia in this survey are addressed (Table 3). Consequently, if we were to repeat the survey today at a time point following this crucial discussion, perhaps not surprisingly, only a small proportion of patient refuse point blank regional analgesia.

Conclusions

Regional anaesthesia has an important role to play in improving postoperative analgesia and other outcomes following upper limb trauma surgery. Improving the quality of information provided regarding anaesthesia will assist patients in making properly informed anaesthesia choices. Surgeons have an important role to play in patient education, as they are the initial perioperative patient contact. The anaesthesia preoperative visit is an essential component of anaesthesia care and should be utilised and developed to improve anaesthesia-related patient education and to manage patient expectations.

Conflict of interest

Nothing to declare

Table 3. Factors which may influence choice of anaesthesia

Question	'Yes' Response % (95% CI)
Factors which may influence anaesthesia choice	
Regional anaesthesia for upper limb surgery improves pain relief for up to 24 hours; would this influence your anaesthetic choice?	80% (74-86)
Regional anaesthesia for upper limb surgery reduces postoperative nausea and vomiting, would this influence your anaesthetic choice?	81% (74-86)
Please indicate the level of sedation you would like to receive if you were to have regional anaesthesia:	
None	23% (17-30)
Light sedation 'Arousable to voice'	30% (23-37)
Heavy sedation 'Deeply sedated'	47% (40-55)
Please indicate on a scale of 0-5 the importance of the following if you are making a choice of anaesthetic technique:	Mean (SD)
Safety	3.7 (1.7)
Better pain relief	3.5 (1.6)
Skill of anaesthesiologist	3.4 (1.8)
Earlier ambulation	2.9 (1.7)
Less nausea and vomiting	2.8 (1.6)

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