

Barriers for Anaesthetists in Performing Nerve Blocks with Ultrasound Guidance

Asif Mahmood, Mohammed Auldin and Asquod Sultan

ABSTRACT

Aim: To review the potential barriers for clinicians in performing nerve blocks with appropriate resolution ultrasound (US) machines as recommended by the National Institute for Health and Clinical Excellence (NICE).

Methods: A paper survey was handed out to anaesthetists of all grades. Information regarding nerve block competencies was gathered along with the availability of ultrasound machines in their area of work, along with any training they may have received in its use.

Results: We gathered responses from 52 anaesthetists. Only 50% of respondents had completed a training course in ultrasound guided nerve blocks. 42% of anaesthetists had their use of an ultrasound for nerve blocks limited by the lack of availability of an ultrasound in their area of work. Of the consultants surveyed, 34% felt competent in performing ultrasound guided interscalene block vs 54% with the landmark technique.

Conclusions: The anaesthetists surveyed demonstrated a range of competencies in the use of ultrasound for the different nerve blocks; this could be due to the lack of training for such blocks, the lack of availability of ultrasound machines or due to competency in performing nerve blocks without ultrasound. This identifies potential deficits in training and the need for appropriate resolution ultrasound machines in the work place.

Background

Nerve blocks have a variety of applications in anaesthesia enabling an extra dimension for patients with regards to their pain control and anaesthetic plan. Anaesthetists can perform nerve blocks by a range of methods including landmark techniques and ultrasound guidance, with both of these techniques having the potential to be used with a nerve stimulator.

Nerve blocks are associated with complications including nerve damage, bleeding, pneumothorax and failure. Ultrasound, if used correctly, may help limit such complications.¹ NICE guidance on the use of ultrasound guidance for procedures, has evolved over the years. Ultrasound guidance is now considered an essential requirement for the placement of central venous lines² and is recommended when performing nerve blocks.³

Method

This survey aimed to assess the methods used by anaesthetists in performing nerve blocks and audited the use and competencies of clinicians in performing such blocks under ultrasound guidance and landmark techniques. This survey also looked at whether performing nerve blocks under ultrasound guidance was hindered by the lack of availability of appropriate resolution ultrasound machines in the workplace.

A paper survey was completed by anaesthetists of all grades at Kettering general hospital, UK and Birmingham Heartlands Hospital, UK between October and December 2011. The survey consisted of a simple, easy to use, tick box table and a

generic area in which participants made further contributions. From this we ascertained the following:

- Grade of clinician.
- Any courses undertaken in ultrasound guided nerve blocks.
- Which nerve blocks the clinicians felt they could perform competently with either method (landmark versus ultrasound guided).
- In the event the anaesthetist could perform a block with or without ultrasound guidance; which method was used if ultrasound equipment was available.
- Was the ability to perform ultrasound guided nerve blocks limited by the availability of an ultrasound machine.

The term “landmark technique” is used when the landmark technique is combined with or without a nerve stimulator and the term “ultrasound technique” when ultrasound guidance is used with or without a nerve stimulator.

Results

We surveyed a total of 52 anaesthetists, subdivided into Consultants 26 (50%), ST/staff grade 17 (33%), CT trainees 9 (17%). Of all grades, only 50% had completed a course in ultrasound guided nerve blocks. 42% of clinicians had encountered situations when they could not use ultrasound guidance for a nerve block because there was no ultrasound machine available at the time of the procedure. The competencies of clinicians with the landmark and ultrasound technique varied depending on the type of nerve block and the grade of clinician (figure 1).

	Consultant (%) n-26		ST/Staff Grade (%) n-17		CT1/2 (%) n-9	
Nerve block	Competent Landmark	Competent US	Competent Landmark	Competent US	Competent Landmark	Competent US
Brachial Plexus						
Interscalene	54	34	58	29	0	0
Supra/Infra clavicular	31	23	29	18	0	0
Axillary	31	31	47	18	0	0
Elbow	12	19	29	12	0	0
Lumbar Plexus	73	0	65	12	11	0
Sciatic						
Anterior	39	8	64	12	0	0
Posterior	42	27	76	18	0	0
Femoral	100	69	100	76	36	11
Epidural	100	19	100	18	36	0
Spinal	100	12	100	18	56	0
Abdominal						
TAP	38	85	29	65	33	11
Rectus Sheath	19	35	18	47	0	11

Figure 1. This table illustrates competencies for different nerve blocks with the landmark technique and ultrasound technique for different grades of anaesthetists

Various routinely performed blocks were surveyed and this revealed a good comparison of the use of ultrasound and landmark technique. For the Interscalene block, the consultants and middle grades combined were competent in performing this block, with the landmark technique 56% and the ultrasound technique 33%. For the Lumbar plexus block, 0% of the consultants surveyed felt competent in performing this block with the ultrasound technique compared to 73% with the landmark technique. The majority of clinicians felt competent in performing the TAP block with the ultrasound technique, 65% versus 35%, for the landmark technique.

Discussion

The findings of this survey and audit have a range of implications for anaesthetists in the workplace:

1) Junior grades of doctors do not feel competent in performing nerve blocks. This may lead to a reliance on senior doctors during on calls to assist in performing blocks such as femoral and TAP blocks. Specific training geared towards junior doctors to make them proficient in such blocks would enable them to provide an anaesthetic plan with more autonomy.

2) A large percentage of consultant grade clinicians felt competent in performing nerve blocks with the landmark technique but not in performing the same blocks with ultrasound guidance. This has implications for training because consultants are the training leads for junior grades of anaesthetists. If consultants do not feel competent in the use of

ultrasound guidance for nerve blocks, this could lead to a self perpetuating cycle.

3) Only 50% of clinicians in this survey had completed a course for ultrasound guided nerve blocks, this coupled with the finding that clinicians did not feel comfortable in performing nerve blocks with ultrasound, indicates the possible need for local training accessible to clinicians to improve their everyday practice.

4) It has been shown that ultrasonic guidance improves the success rate of interscalene blocks.⁴ The practice amongst clinicians in this survey reveals that the majority of anaesthetists (middle and consultant grades) are competent with the landmark technique 56% compared to the ultrasound technique 36%. This also highlights a training deficit which if addressed would enable clinicians to offer a more successful method of performing the interscalene block.

5) This survey highlighted the lack of availability of appropriate ultrasound machines in different departments, leading to some clinicians utilising the landmark technique, when ultrasound guidance was the preference. This has the potential of a patient receiving a nerve block technique which may have been riskier and less efficient. This highlights a potential need for investment and accessibility of appropriate resolution ultrasound machines in the different work places of a hospital environment.

The main limitation of this project was the small number of clinicians in the respective hospitals the survey was performed in. However, we feel the results reflect the practice of clinicians across most anaesthetic departments. The recommendations highlight a training need for anaesthetic trainees in the use of ultrasound guided nerve blocks. This survey could form the basis of a much larger survey of clinicians across the UK to provide a more insightful review of the competencies and preferences of anaesthetic trainees in performing nerve blocks and the availability of appropriate resolution ultrasound machines.

The difference in the number of clinicians in each category limited comparisons between groups. A larger cohort of participants would enable comparison of nerve block techniques between different grades of clinicians.

This survey included all clinicians regardless of their sub-specialist interest. This may result in a skewing of results, depending on the area of interest of the clinicians surveyed.

This work only highlights the competencies and preferences of clinicians in performing nerve blocks. No extrapolation can be made to complications that arise from the choice of either technique. Studies have shown an improved success rate when performing nerve blocks with ultrasound.⁴ However this does not directly apply to a specific clinician who may have substantial experience in their method of choice in performing a nerve block.

Competing Interests

None declared

Author Details

Asif Mahmood CT2 Anaesthesia, MBChB, Anaesthetic Department, Kettering General Hospital, Rothwell Road, Kettering UK
 Mohammed Auldin CT1 Anaesthesia, MBChB, Anaesthetic Department, Birmingham Heartlands Hospital, Bordesley Green East, Birmingham UK
 Asquid Sultan MBBS, FFARCSI, DESRA, Consultant Anaesthesia, Anaesthetic Department, Kettering General Hospital, Rothwell Road, Kettering, NN16 8UZ, UK.
 CORRESPONDENCE: Asif Mahmood CT2 Anaesthesia, MBChB, Anaesthetic Department, Kettering General Hospital, Rothwell Road, Kettering, NN16 8UZ, UK.

Email: asifmahmood25@hotmail.com

REFERENCES

1. Soeding PE, Sha S, Royse CE et al. A randomized trial of ultrasound guided brachial plexus anaesthesia in upper limb surgery. *Anaesthesia and Intensive Care* 2005; 33: 719–25.
2. Guidance on the use of ultrasound locating devices for placing central venous catheters. National Institute for Clinical Excellence. Technology Appraisal Guidance. September 2002; Number 49
3. Ultrasound-guided regional nerve block. National Institute for Clinical Excellence, January 2009; Number IPG285
4. Kapral S, Greher M, Huber G et al. Ultrasonographic guidance improves the success rate of interscalene brachial plexus blockade. *Reg Anesth Pain Med* 2008; 33:253-8.