Author's response to reviews

Title: A survey of education and confidence level among graduating anesthesia residents with regard to selected peripheral nerve blocks

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Author's response to reviews: see over
The authors would like to thank the reviewers for their constructive comments. Please see our responses in red. We have revised the manuscript accordingly. We also changed the title of the manuscript to reflect the study more accurately.

The first Reviewer's comments:

1. The authors seek to characterize the type and number of blocks graduating residents have performed. They also seek to establish how "comfortable" they are at performing the pre-defined list of blocks. The authors do not provide a definition of "comfortable", a subjective term. For example, do they mean comfortable attempting the block? Or, performing the block independently?

   Please see attached survey questionnaire for clarification. We asked if they were comfortable attempting the block (Question 6: “Which technique are you more comfortable with?” / Question 7: “Are you comfortable with placing an indwelling catheter?”). We also asked how residents feel about independency (Question 8: “Do you feel ready to perform PNBs independently upon residency graduation?”).

2. In describing the methods there is no indication of how the number of residents who SHOULD HAVE received the questionnaire would be calculated. There is also no indication of how the number of residents who DID actually receive the questionnaire would be calculated.

   Due to the nature of the anonymous survey, the exact number of residents who should have or did actually receive the survey cannot be calculated with certainty. We know that 14 program directors received our request and obliged by sending the survey link to their graduating residents. The remaining program directors either declined to participate or did not respond and thus we assumed that the survey was NOT sent to their programs. Thus, we estimate that the survey was received by approximately 250-300 senior residents.

3. How was the response rate calculated? Is this an estimate?

   We estimate that 300 residents actually received the survey link. Due to the lack of responses from certain program directors to accept or decline participation, these programs were excluded from the response rate calculation.

4. Did all respondents complete the questionnaire in full?

   We programmed the survey not to accept unfinished questionnaires. Unless respondents answered all questions, the survey could not be submitted.

5. It is not appropriate to attribute any relationship between self reported comfort and competence - sentence 1 in paragraph 2 of the discussion. This is inappropriate.
We agree with the reviewer, the word “competence” was removed from the sentence.

6. In outlining the limitations of this study, I would think the most significant limitation is the low response rate. It would be more appropriate to have this as the first limitation mentioned in the discussion.

As per the reviewer’s suggestion, we have changed the order of limitations in the discussion.

7. The references used in this manuscript are largely 10 to 15 years old. Given the explosion in interest in the area over the last few years and the large number of relevant publications I feel this is inappropriate.

We agree that there has been an explosion in interest in regional anesthesia over the last several years. However, resident education in regional anesthesia may not be keeping up with the clinical and academic advancements. Furthermore, there has not been a study assessing comfort level in performing nerve blocks since Smith’s study in 1999. This was one of the factors that prompted us to pursue this study. It is our hope that the results of our study will prompt an increase in educational efforts in regional anesthesia.

8. The title of figure 2 is incorrect - it does not correspond to the description in the text.

The title of Figure 2 has been changed. In addition, the labels of Y axis of Figure 2 and 3 have been changed (from “percent” to “percentage of residents”).

9. The authors should outline why comfort levels were sought, and why they are significant in the context of assessing educational outcomes.

Comfort levels were used as a surrogate marker of residents’ confidence in performing certain types of peripheral nerve blocks. Our thought was that if residents were not comfortable performing certain nerve blocks as a result of inadequate exposure or education, they may choose not to perform these blocks upon graduation from residency or may be unable to teach them to future generations of anesthesiologists. Using comfort level as our surrogate marker, we hoped to identify areas of weakness in residency education in order to make suggestions for further educational improvements.

The Second Reviewer

1. How did you select these 6 PNB? Why not supraclavicular, infraclavicular those become necessary with the spread of Ultrasound and are very easy to learn. Or axillary block, the last one is a very essential block, whereas you selected lumbar block that is known to be very dangerous and is avoid by many anesthesiologist.
As the reviewer indicated, supraclavicular and infraclavicular blocks are more commonly performed with ultrasound. We decided to include “classic blocks” which can be done with either a nerve stimulator or ultrasound-guided technique. Some anesthesiologists may not be comfortable performing supraclavicular or infraclavicular blocks if they are not familiar with the ultrasound technique. Lumber plexus blocks have been reported to have a higher complication rate; however, it has been routinely performed at our institution with a good safety profile.

2. You ask for sciatic nerve block but which technique? There are many.

As the reviewer points out, there are several anatomical locations to perform a sciatic nerve block, including anterior and posterior (gluteal, subgluteal). To make the survey simple, we asked about the techniques (ultrasound, nerve stimulation or paresthesia) but not the approaches. We felt that dividing some of the nerve blocks into different approaches may make the survey too cumbersome and further decrease our response rate.

3. This article will be read by many readers across the world, you should explain CA-3.

CA-3 stands for the third clinical anesthesia year. It has been added to the manuscript.

4. Did these residents have regional anesthesia rotation?

The survey did not ask whether residents had a formal regional anesthesia rotation. Based on personal communications, the regional rotation experience can vary widely amongst different programs- i.e., residents without a formal regional rotation may have a wide depth and breadth of exposure to peripheral nerve blockade whereas some residents with a formal regional rotation do not have a very expansive experience. Thus, we felt it unnecessary to classify residents into these two groups.

5. How could you explain the little number of blocks performed?

The vast majority of respondents (91%) indicated that they had performed at least 40 peripheral nerve blocks, the minimum standard set by the Accreditation Council for Graduate Medical Education (ACGME) for senior anesthesia residents. In fact, 74% of respondents reported that they had performed over 60 peripheral nerve blocks- please refer to Table 1. Some residents had limited exposure to some of the peripheral nerve blocks; the most limited experience was with lumbar plexus blocks- please refer to Table 2.

6. “Reflecting the increasing popularity of PNBs, our study has shown that the number of PNBs performed during residency has significantly increased over the last decade.” Is it the main result of your study?
Yes, it is one of the main results. We go on to describe how our results differ dramatically with those of Smith’s study from 1999, especially with regard to the increase in the number of peripheral nerve blocks performed by residents. However, more importantly, we point out that there is still room for improvement later in the discussion.

7. “Although 91% of respondents met the ACGME criteria for forty peripheral nerve blocks, 85% indicated they were either “not comfortable” or only “somewhat comfortable” with lumbar plexus blocks.” Indeed, it is the most dangerous block (see Auroy et al. Anesthesiology 2006).

Thank you for the reference. We agree that the lumbar plexus block is an advanced technique. We have included this reference in the manuscript. We have emphasized the importance of proper education and exposure to this nerve block.

8. “A steep learning curve was also reported for neuroaxial anesthesia where a 90% success rate was not consistently achieved until 45 spinals and 60 epidurals were performed.” Please delete, this is not the subject.

We have deleted this sentence.

9. You should discuss the learning curve for each block. The goal of 40 PNB is insufficient to be efficient in all blocks because each block has its own specificity.

We very much agree that each block has its own specificity and learning curve (i.e., femoral nerve blocks may be mastered sooner than sciatic nerve blocks). However, because we did not ask after how many of each type of PNB each resident would feel comfortable or competent performing it, we are unable to generate learning curves for each specific PNB. This, however, would be a great area of further research that we are studying.

10. Figures
- Could you provide statistical sign (such as *) on the figure to be clearer, concerning the time effect and the treatment effect.

We are unclear what suggestion the reviewer is making in this comment.