Reviewer’s report

Title: Comparison of lumbar plexus block using the axis in-plane method at the plane of the transverse process and at the articular process: A randomized controlled trial

Version: 0 Date: 21 Jul 2017

Reviewer: Vishal Uppal

Reviewer’s report:

Thanks for the opportunity to review this trial. The authors are describing an interesting approach to lumbar plexus block (LPB).

Major strengths: The technique of ultrasound-guidance for lumbar plexus block is evolving, so the topic is important.

Figures 1 and 2 are excellent in describing the technique.

Major weaknesses:

The description of the methodology and written explanation of the technique is not very clear. Please revise the methodology and results section in a way that allows the trial to be repeated if needed. The described technique resembles the shamrock approach, given the manner of ultrasound image acquisition, as described by Sauter et al. However, here the needle insertion approach is adjacent to the probe as opposed to para-median. The control group uses a technique as described by Doi et al, though this technique has not gained widespread popularity because of various logistical reasons.

The title is misleading: To compare "beach chair", an ultrasound image description, with "short axis in-plane method" which means a needle insertion approach is misleading. Please revise.

Feasibility of the technique: The authors have presented a mean BMI of 22 for their population. The height and weight information of the population is missing. I suspect their technique would be difficult to perform in the general population as the needle may not reach the lumbar plexus when inserted that far laterally. Furthermore, identification of structures may be difficult when you start with lateral above the iliac crest.

The description of outcomes: The description of outcomes as used by the authors is confusing throughout: "image positioning time"; "puncture time"; and "number of puncture times". It is suggested these should be replaced by "imaging time," "needling time" and "number of needle punctures or attempts."

The rationale for the study is not convincing: On Page 4, line 55: "could not achieve the requirement of continuous visualization during the entire puncture process." The authors do not provide any reference or evidence to support this claim.
Page 5, line 5: The claim that the Doi technique reveals that "target is often located in this anechoic region" is incorrect. The Doi technique visualizes the plexus in the inter-transverse process area. As well, the authors refer to "rainbow shaped ultrasound signal" multiple times without any description or figure showing it. Please explain clearly.

Methodology poorly described: The trial registry is in the Chinese language, therefore, I was unable to extract any information. The initials of the performers need to be provided e.g. RLV, CS, CY. The level of experience and the explanation of the training of the performers are missing. The method of performing the sciatic block needs to be described.

Also, the length of needle used for the lumbar plexus block is not given.

Statistical analysis: The primary outcome is not stated. The minimal clinically important difference is not given. Delta for sample size calculation is not described. I get an impression that a delta of 33% reduction in epidural spread was used (40%-6.67%).

Effect size:

Page 12: "The image positioning time [34.2 sec; 95% CI, (28.2-40.2) vs. 48.9 sec; 95% CI, (42.9-54.9), \( P = 0.001 \)], the puncture time [85.0 sec; 95% CI, (68.8-101.2) vs. 131.4 sec; 95% CI, (99.8-162.9), \( P = 0.013 \)]"

Instead of using CI of each value it would be more useful if the authors presented the mean difference (MD) of each outcome with 95% CI.

Page 13 "The incidence of epidural anesthesia in the beach chair group was significantly lower than that in the short axis in-plane group [1 case (3.3%) vs. 9 (30.0%), \( P = 0.006 \)]"

Please clarify if the authors have used chi-squared test for low expected counts.

The discussion is poorly structured: I would suggest the author follow an order such as:

* State the main findings
* Explain how these findings fit in with previous studies, why are they different/same?
* Include what this study adds to the knowledge of the subject
* Address the weaknesses of the study
* Provide conclusions

Minor points:

The manuscript needs major language and grammatical editing.
Page 4: "L1-3 anterior branch, and L4 anterior branch." Could have been L1-4 anterior branches. "posterior quarter quadrant of the psoas major muscle" is usually described at posterior 1/3 of psoas. "so that it make the front, medial" should be "innervates the front, medial."

Page 8: Did the authors have any patients with failure to elicit nerve stimulation?

Table 1: Please provide height and weight of population, remove column of p-values. For an RCT that is not needed.

Table 3 can be deleted as all the values are non-significant. This can be simply stated in the text. The first row, the third column says 9.3% instead of 93%

Table 2 and Table 4 should be merged

Figures 1 and 2: Please provide labels for the structures.

Figure 2: LP is incorrectly labeled.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

Quality of written English
Please indicate the quality of language in the manuscript:

Not suitable for publication unless extensively edited


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