

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Radiofrequency denervation for chronic back pain: a systematic review and meta-analysis
AUTHORS	Chappell, Mary; Lakshman, Raj; Trotter, Patrick; Abrahams, Mark; Lee, Michael

VERSION 1 - REVIEW

REVIEWER	Robert J. McCarthy Rush University, USA
REVIEW RETURNED	16-Dec-2019

GENERAL COMMENTS	<p>The authors have updated a review of RF ablation for chronic back pain.</p> <p>I have 2 major concerns.</p> <p>The authors have used a fixed effects model for estimating mean differences and confidence intervals. Given the varied nature and sizes of the studies included in the meta-analysis the authors need to use a random effects model. The large I-squared also argue against the use of a fixed effect approach. Under the assumption that the goal of research is generalizable knowledge, results indicated that the publications using Fixed Effects confidence intervals (CIs) around mean effect sizes were on average 52% narrower than their actual width, with similar results being produced by the two Random Effects procedures (Br J Math Stat Psychol 2009; 62:97-128). The meta-analysis should be re-performed using a random effects model.</p> <p>The results of the duration of the effect shown in Table 1 appears to be derived from the same studies. In that case adjustment for multiple comparisons should be made in the estimates and the CI of the estimates. Conversely, a meta-regression of the differences by the duration of follow-up could be performed to assess the impact of duration on the mean differences and confidence intervals.</p>
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REVIEWER	John Boscardin University of California, San Francisco USA
REVIEW RETURNED	30-Jan-2020

GENERAL COMMENTS	<p>The authors have conducted a series of meta-analyses on a small number of studies. Of note, the authors have used fixed effects meta-analysis to synthesize findings. There are two strong reasons</p>
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	<p>to prefer random effects meta-analysis in this setting: (1) there is substantial a priori reason to believe that the various studies are not estimating a single common effect and that in fact the "true" study-specific effects are likely to be heterogeneous (this is usually the case when synthesizing available studies culled from a literature search); (2) there is visual evidence of heterogeneity in the forest plots and summary statistic tables. Furthermore, many authors (e.g. Borenstein, Hedges, et al. 2010) would argue that reason (1) is sufficient to strongly recommend random effects meta-analysis as a more appropriate framework in most settings and that the common practice of first checking on (2) before deciding whether to use fixed or random effects is flawed.</p>
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VERSION 1 – AUTHOR RESPONSE

Responses to reviewer's comments

Reviewer 1	
<p>The authors have used a fixed effects model for estimating mean differences and confidence intervals. Given the varied nature and sizes of the studies included in the meta-analysis the authors need to use a random effects model. The large I-squared also argue against the use of a fixed effect approach. Under the assumption that the goal of research is generalizable knowledge, results indicated that the publications using Fixed Effects confidence intervals (CIs) around mean effect sizes were on average 52% narrower than their actual width, with similar results being produced by the two Random Effects procedures (Br J Math Stat Psychol 2009; 62:97-128). The meta-analysis should be re-performed using a random effects model.</p>	<p>Many thanks for your comment. The meta-analysis has been re-performed using a random effect model.</p>
<p>The results of the duration of the effect shown in Table 1 appears to be derived from the same studies. In that case adjustment for multiple comparisons should be made in the estimates and the CI of the estimates. Conversely, a meta-regression of the differences by the duration of follow-up could be performed to assess the impact of duration on the mean differences and confidence intervals.</p>	<p>Repeated data has been removed so that data appears only once in the analysis.</p> <p>We have removed results at 1,2 and 3 months to avoid making multiple comparisons. Figure 3 has been removed as it displayed these time points.</p>
Reviewer 2	
<p>The authors have conducted a series of meta-analyses on a small number of studies. Of note, the authors have used fixed effects meta-analysis to synthesize findings. There are two strong reasons to prefer random effects meta-</p>	<p>Many thanks for your comment. The meta-analysis has been re-performed using a random effect model.</p>

<p>analysis in this setting: (1) there is substantial a priori reason to believe that the various studies are not estimating a single common effect and that in fact the "true" study-specific effects are likely to be heterogeneous (this is usually the case when synthesizing available studies culled from a literature search); (2) there is visual evidence of heterogeneity in the forest plots and summary statistic tables. Furthermore, many authors (e.g. Borenstein, Hedges, et al. 2010) would argue that reason (1) is sufficient to strongly recommend random effects meta-analysis as a more appropriate framework in most settings and that the common practice of first checking on (2) before deciding whether to use fixed or random effects is flawed.</p>	
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VERSION 2 – REVIEW

REVIEWER	Robert J. McCarthy Rush University Chicago, Illinois, USA
REVIEW RETURNED	04-May-2020

GENERAL COMMENTS	<p>The authors state that they have conducted the meta-analysis for "studies investigated effectiveness in different population groups with slightly varying intervention and control group treatments" as was directed in the prior review. However, for evaluating "treatment versus no treatment/sham was produced by fixed effects meta-analysis of scores for each arm" they have used a fixed effect model. Once again, as described in the first review of this manuscript, all meta analyses should be performed using a random effects model due to the potential difference in study design among the studies. Please revise this analysis and the Forest plots (figures 2, 3 and 4) that describe the results of this analysis.</p>
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REVIEWER	John Boscardin University of California, San Francisco United States of America
REVIEW RETURNED	05-May-2020

GENERAL COMMENTS	Thanks for addressing my previous comments.
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VERSION 2 – AUTHOR RESPONSE

Reviewer 1 - Second review	
<p>The authors state that they have conducted the meta-analysis for "studies investigated effectiveness in different population groups with slightly varying intervention and control group treatments" as was directed in the prior review. However, for evaluating "treatment versus no treatment/sham was produced by fixed effects meta-analysis of scores for each arm" they have used a fixed effect model. Once again, as described in the first review of this manuscript, all meta analyses should be performed using a random effects model due to the potential difference in study design among the studies. Please revise this analysis and the Forest plots (figures 2, 3 and 4) that describe the results of this analysis.</p>	<p>Many thanks for highlighting this.</p> <p>The analysis of treatment versus control/sham had been conducted using random effects meta-analysis (and new Figures produced) but this sentence should have been deleted from the text.</p> <p>Since data for 1-3 month outcome have been pooled (to avoid had making multiple comparisons), Figure 3 has been removed and hence the section of text that you refer to has been deleted.</p>

VERSION 3 – REVIEW

REVIEWER	Robert J. McCarthy Rush University Chicago, Illinois USA
REVIEW RETURNED	19-May-2020
GENERAL COMMENTS	The authors have made the requested changes to the manuscript. Thank you for your clear and well done revision.