Reviewer’s report

Title: Systematic quantitative overviews of the literature to determine the value of diagnostic tests for predicting acute appendicitis

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Reviewer: Dr Dave Flum

Level of interest: A paper of limited interest

Advice on publication: Accept after discretionary revisions

This is an area of great interest to the surgical/radiologic and ER medicine communities and this proposed project is quite timely. Our group attempted to do this very same project last year and encountered several problems that I believe will plague these researchers as well. These potential problems do not represent a failing of the study design (which I think is adequate) but rather serious roadblocks to getting this study completed in the fashion they hope. The proposal could be enriched if they make a priori plans to deal with the following;

1) There is tremendous variation in the ways reported diagnostic tests are performed (helical vs non-helical, PR contrast alone vs PR + PO, limited cuts through the pelvis or pelvis+abdomen) and the best published reports do not represent the most current techniques. There is a strong inclination to pool these results as "CT scanning" because of statistical strength in numbers. These reports however, represent such a heterogeneous group that such pooling (though in name accurate) provides little information of clinical relevance. If you don't pool them, your are left with 1-2 poorly designed prospective trials and many more "case series" which are inherently biased.

2) What will the authors do when they find that blinding is almost never reported and that contacting the authors about blinding undermines the claim of blinding?

3) What will the authors do when they find that there is a moving target out there in the literature....where some studies break results into positive, negative, indeterminate and other pathology, other researchers divide it into positive or negative. Those that add the indeterminate and other category are effectively taking those cases out of consideration for the dx of appendicitis and do not consider them part of the sensitivity/specificity analyses

4) What will the authors do when they find that most studies exclude patients with "obvious appendicitis" but give no information about dx outcome in that group. This both biases the sample population and limits the pooling of data.

5) There may be "gaming" of the system when favorable reports are published (i.e learning curves among radiologists often determine when they start their "count") . As such, all retrospective studies should be removed from the list of those eligible for consideration.
6) By limiting the study to the few prospective data sources, I believe the researchers will be unable to complete most of their statistical analyses (for lack of power) and essentially have a "negative study".

7) This topic is better suited to systematic review than meta analysis. I think this should be the focus of the project rather than trying to generate point estimates and CI from highly heterogeneous source data.

**Competing interests:**

None declared.