

Peer Review File

Article information: <https://dx.doi.org/10.21037/ls-22-7>

Reviewer Comments

Comment 1: My primary concern is with the primary outcome of the article, which was defined as the negative appendectomy rate. While I can see why that was chosen as the primary outcome, I was curious why a false negative, or misdiagnosis of a patient with appendicitis was not the primary outcome. Within our practice, the arrival at a false negative diagnosis of appendicitis is more consequential to the patient than a false positive. It is somewhat concerning the FNR in females is one third. I'm curious if any of those individuals suffered complications due to a delay in their diagnosis?

Reply 1: The authors agree that a false negative diagnosis of appendicitis has a potentially greater consequence for a patient than a false-positive diagnosis. In the current study, the false-negative rate (FNR) in females refers to the adult appendicitis score (AAS), which was not used to influence clinical practise at the time but rather retrospectively calculated using clinicopathological demographics. Data regarding a false negative clinical diagnosis of appendicitis were not included in our dataset. However, of the 361 patients included in the study, only 4 underwent operation more than 48 hours after admission, only 2 of whom had a diagnosis of appendicitis and none of whom developed complications within 30 days of operation. This suggests that diagnostic delay was not a common problem in this cohort, whereas the high rate of other diagnoses in patients undergoing diagnostic laparoscopy suggests that patients may have proceeded to surgery too easily.

Changes in the text: None

Comment 2: On page 8, line 172, the sentence appears to have been cut off.

Reply 2: This was a typographical error. This sentence has been removed.

Changes in the text: 'Missing data were' has been deleted.

Comment 3: A Cochrane database review (<https://pubmed.ncbi.nlm.nih.gov/31743429/>) from 2019 found the accuracy of an adult (>14 years of age) having appendicitis after a positive CT was 0.92. I'm curious if the authors could address why the sensitivity of this study, was much lower. Particularly in females. One would assume that it is due to the low power of the study.

Reply 3: The authors agree that the limited number of patients who underwent CT scanning is a potential explanation for the differences seen in the sensitivity of this investigation. Another possible explanation is that the above review only included prospective studies. One could suspect that the quality of CT reporting may differ between a prospective study evaluating the use of this modality in the diagnosis of appendicitis and a retrospective study including 'real-world' reports that are available to surgeons in everyday clinical practice.

Changes in the text: None

Comment 4: With regards to imaging, why was ultrasound used so infrequently?

Reply 4: This is probably due to fact that during the study period, clinical judgement was the main mechanism for diagnosing appendicitis and diagnostic imaging was only performed in cases where the diagnosis was thought to be unclear. At our institution, in such cases of uncertainty, CT scanning tends to be preferred over ultrasound with the rationale that the former modality would be more likely to detect other pathology if a normal appendix is seen.

Changes in the text: None

Comment 5: Given that less than 20% of the study population underwent imaging, a change to the study title should be considered. This paper looked to evaluate risk scoring systems and their utility, retrospectively. Imaging was utilized very infrequently and was only an adjunct to the scoring systems. It wasn't particularly useful in differentiating the patients either. Given that imaging isn't typically completed, it would be good to know why certain patients underwent computed tomography scans. This would likely account for the low sensitivity rate.

Reply 5: The title of the article has been altered as suggested. As referred to above, diagnostic imaging was only performed in cases where the diagnosis was thought to be unclear. This is also referred to in the methods of the original manuscript

Changes in the text: Title altered to: 'Risk scoring systems in patients with suspected acute appendicitis scheduled to laparoscopy – a single centre retrospective analysis'

Comment 6: I was curious if the authors had any recommendations on how to increase the utility of a risk score system in patients with suspected acute appendicitis?

Reply 6: A statement regarding the potential utility of risk scoring systems is given in the conclusion of the original manuscript. With the data presented, the authors do not believe that the AAS will be of much clinical use in our female population, in whom the routine use of pre-operative imaging should be considered as an alternative strategy. In our male population, the AIRS does appear to be of some benefit and could be used as a screening tool to identify men in whom a diagnosis of appendicitis is unlikely, who may benefit from diagnostic imaging prior to a diagnostic laparoscopy.

Changes in the text: None

Second review

Comment 1: The authors have changed the title of the article to reflect the goals of their paper. On page 2, line 45 and 46, the final sentence of the background should be altered to also reflect the goals of the paper.

Reply 1: The aims of the study have been altered in the both the abstract and the introduction as suggested.

Comment 2: On page 3, line 75, consider altering the phrase "real world" to "clinical practice".

Reply 2: This phrase has been altered as suggested.

Comment 3: On page 3, line 107, consider a change to the stated goals of the paper. Due to the retrospective nature of this study, retrospective application of scoring systems, and the limited patient size, the wording of this being a validating study is misleading. The study seeks to evaluate the utility of scoring systems in a non-academic, clinical scenario.

Reply 3: The stated goals of the study have been altered in the introduction as suggested.

Comment 4: As defined by the paper, the primary outcome was histological diagnosis of appendicitis. However, within the results section a macroscopic diagnosis of appendicitis was the defined outcome. For clarification, was macroscopic defined as an intra operative diagnosis of appendicitis or a pathologic diagnosis? The way it currently reads, it seems to be an intra operatively diagnosis.

Reply 4: A macroscopic diagnosis of appendicitis refers to a diagnosis made by the operating surgeon on the basis of operative findings. The relevance sentence in the results has been amended to specify this as follows:

“A macroscopic diagnosis of appendicitis, made at the time of surgery by the operating surgeon, was made in 287 patients (79.5%), in whom an appendicectomy was performed.”

However, the negative appendicectomy rate was calculated on the basis of histopathological assessment of surgical specimens.

Comment 5: I was curious if the authors would consider elaborating on imaging within the discussion of the text. Female reproductive diagnoses are typically best elicited by ultrasound so it seems that it may be a good technique for alternative diagnoses to appendicitis

Reply 5: As the reviewers have rightly pointed out, the number of patients undergoing pre-operative imaging in the current study was small and the focus has been shifted onto the use of risk assessment scores. A brief overview of the pros and cons of the available imaging modalities is given in the discussion and, given that this section is already rather lengthy, we are not certain that the addition of further details here would be of benefit. However, if the editor feels it would be of benefit, we would be willing to amend this section.

Comment 6: In the final paragraph, I see that CT and MRI are suggested pre-operative imaging techniques for females, by why not ultrasound?

Reply 6: The relevant sentence in the discussion has been amended to include ultrasound and now reads as follows:

“Consideration should be given to a policy of routine pre-operative imaging in young women, using ultrasound, non-contrast low dose CT or MRI dependent on local expertise and resources.”