Reviewer’s report

Title: Trends in Diagnostic Approaches for Pediatric Appendicitis: Nationwide Population-Based Study

Version: 0 Date: 05 Sep 2016

Reviewer: Michael O. Esan

Reviewer’s report:

I would like to thank the authors for submitting this article for publication. The article is well written, and highlights utilization of diagnostic imaging over a 9-year period and trends in non perforated and perforated appendicitis in children. The major flaw of this study is the lack of clinical and demographic information which is key to the incidence of the main outcome-perforated appendicitis. Even though this was addressed in the discussion as a limitation, it is still very relevant to the evidence presented by the authors for publication. I have outlined my concerns in the points below.

Major:

1. Results section; Table 1:

Q1- How were the age groups determined? Is there any rationale behind selecting 3 age groups vs 2, or for the ages used for each group? Is there historical literature which informed this categorization? Categorizing data into smaller groups increases the likelihood of finding a significant association purely by chance. Was there any statistical correction used to adjust for this? This was not stated in the methods.

Q2 Do you have any data on socio-economic status, access to healthcare/insurance information, duration of symptoms, presenting complaint/physical signs? This important information was not provided in the baseline characteristics table.

2. Results section, line 142-145: Higher rates of perforated appendices were detected among patients between 7 and 12 years old and < 6 years old, compared to those aged 13-18 years.

The trend seen with higher incidence of perforation in the younger age groups is not surprising, given that younger children are less able to express symptoms, can have atypical signs and may have a longer duration of symptoms prior to presentation. Unfortunately, this important information—duration of symptoms is unavailable and is likely a major confounder that was not adjusted for in this study.
3. Results section, line 139-145: The authors highlight a significantly increased odds of perforation if you were diagnosed by CT (OR 2.744; 95% CI 2.55, 2.95; p<0.001) or by US and CT (OR 5.062; 95% CI 3.14, 8.17; p <0.001) compared to patients without radiologic evaluation. Only age and gender were adjusted for in this analysis. Important clinical information such as duration of symptoms and latency period (lag time from clinical suspicion to definitive diagnosis by US or CT) were not available nor adjusted and may be major confounders in this analysis.

Minor:

Results section, line 129-130: the incidence of perforated appendicitis cases remained relatively stable at 0.024%~0.023% from 2003 to 2012 - it is interesting that the increased utility of US and CT did not affect the outcome of perforated appendicitis over the study period, but the incidence of non perforated appendicitis reduced. what do the authors think is responsible for the stable perforated appendicitis rates? this was not addressed in the discussion section.

Results section, line 135 - 137: The percentage of patients proceeding to appendectomy without evaluation of US and CT gradually decreased from 97% in 2003 to 79% in 2012- what is the hypothesis for the increase in diagnostic imaging utilization over the study period? change in national guidelines? increased availability of imaging services at health centers? improved healthcare access for the population in general? this was not addressed in the discussion section.

Discussion section, line 179: the authors infer that latency from clinical suspicion to confirmation of diagnosis by CT or US may increase the risk of appendiceal perforation - while this may hold true, this information was not collected so it cannot be determine if this indeed is the case. in addition, other potential confounding variables such as duration of symptoms and clinical signs were not adjusted for in the analysis so the incidence of appendiceal perforation may not be solely due to a prolonged latency period.

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

Yes

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

No

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

No

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

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