Reviewer's report

**Title:** A hybrid decision support model to discover informative knowledge in diagnosing acute appendicitis

**Version:** 1  **Date:** 28 October 2011

**Reviewer:** Stamatis Efstathiou

**Reviewer's report:**

Although the authors have performed a pedantic assessment of the subjects' characteristics, this cross-sectional study adds some novel information of marginal clinical value to our knowledge on the very hot topic of accurate diagnosis of acute appendicitis. Appropriate design and analysis have been applied, whereas the conclusions are persuasively supported by data presentation. However, there are certain points of concern that should be addressed. In general, the small sample size, the rather confusing interpretation of findings and the absence of a validation cohort weaken the potential of this study to further elucidate the issue at hand. The reported observations might become relatively valid only in the case of a major revision on the basis of the suggestions below.

Major Compulsory Revisions

1. The authors should apply the decision support model yielded from this study to an independent prospective database of patients with suspected appendicitis in order to validate its accuracy. Unless this is done on a blinded basis the message conveyed is fundamentally weak.

2. The selection of cut-off points for dichotomizing continuous variables in multivariate analysis needs to be described and justified more clearly. This is crucial for the validity of the major study results.

3. From a clinical point of view, it remains unclear if the coexistence of all five variables included in the three rules (NEU > 73% and U-glucose negative and chief complaint RLQ pain and EOS > 0.3% and lipase # 32) provides superior diagnostic accuracy. This could be more relevant for everyday, bedside practice than the three rules separately.

4. No mention is made regarding missing values and how they were handled in the analysis (for example listwise or pairwise deletion).

5. Has the normality of data distribution been examined (i.e. by the Kolmogorov-Smirnov test)? In many previous similar studies, the values of such predictors have been log-transformed, inasmuch as they showed non-normal distribution.

6. Has the multivariate model been assessed for multicollinearity? (the latter is a
common problem in simultaneous analyses of various risk factors). This checking could be done, for example, by calculating the variance inflation factor or the condition number.

7. The discussion section could be shortened to be more concise and focused. The paragraph “From the decision support model…normal appendix” (pages 11-12) should be moved to the Results section.

Minor Essential Revisions

8. Were any CRP measurements done?

9. Are there any imaging data available for these patients (for example abdomen U/S, which is routinely performed in most patients with acute abdominal pain)?

10. The English used as well as the application of abbreviations are generally poor, thus downgrading the verbal support of scientific arguments in this paper.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests