

## 00138 A Novel Non-invasive Appendicitis Score With a Urine Biomarker

Fan Jing Dan<sup>1</sup>, Yap Te-Lu<sup>2</sup>, Candy Choo<sup>2</sup>, Chen Yong<sup>2</sup>, John Allen<sup>3</sup>, Low Yee<sup>2</sup>, Anette Jacobsen<sup>2</sup>, Ho Meng Fatt<sup>4</sup>, Shireen Nah<sup>2</sup>

<sup>1</sup>National Dental Centre Singapore, <sup>2</sup>KK Women's & Children's Hospital, <sup>3</sup>Duke-NUS Medical School, <sup>4</sup>National Cancer Centre Singapore

**Aims:** Current diagnostic scores for appendicitis are based on haematological markers which mandate venepuncture for all patients. We evaluate the performance of a new score incorporating a urine biomarker, Leucine rich alpha-2-glycoprotein (LRG).

**Methodology:** From January to August 2017, we prospectively enrolled children aged 4-16 years old, admitted to our wards suspected of appendicitis. Urine samples for LRG analysis were obtained from patients on admission and pre-operatively. Urinary LRG levels were quantified by enzyme-linked immunosorbent assay (ELISA) after correction for patient hydration status. The diagnosis of appendicitis was based on operative histology. Logistic regression was used in statistical analysis.

**Result:** A total of 148 patients were recruited of which 42(28.4%) were confirmed to have appendicitis. Our Appendicitis Urinary Biomarker(AUB) score incorporated 4 variables (3 clinical, 1 urinary biomarker) whereby:  $y = -2.6691 + 1.604 \times \text{characteristic of pain} + 0.943 \times \text{Right iliac fossa tenderness} + 1.540 \times \text{Pain on percussion} + 0.00384 \times \text{LRG/Creatinine (mg/mmol)}$

(For each clinical variable, its presence = 1 and absence = 0)

The predicted probability of appendicitis,  $p = \frac{\exp\{y\}}{1+\exp\{y\}}$

Area under the ROC curve for AUB was 0.823 versus 0.783 for Pediatric

Appendicitis Score (PAS) on the same cohort of patients. Using a cut-off of  $p = 0.15$ , sensitivity for the AUB was 97.6%, negative predictive value 97.6%, positive predictive value 38.3%, negative likelihood ratio 0.06 and specificity 37.7%. At this cut-off, the AUB correctly identified 40 non-appendicitis patients with one false negative.

**Conclusion:** The AUB score's performance as a negative predictor for appendicitis appears to be superior to PAS which requires blood sampling. However, its utility will require validation in a larger cohort of patients.