**OBJECTIVE**: Assess diagnostic performance and timeliness of MRI for suspected acute appendicitis versus other modalities of ultrasound (US) and computed tomography (CT).

**METHODS**: Single institution, IRB-approved, retrospective study of adults with suspected acute appendicitis in emergency department between May 2017 and May 2018. Diagnostic performance was examined using a contingency table. Timeliness was analyzed by comparing average patient wait times among modalities, defined as between times of initial imaging and subsequent management.

**RESULTS**: 599 patients were examined, including 445 US (54.7%), 137 MRI (16.9%), and 231 CT scans (28.4%). Sensitivity, specificity, and diagnostic yield of MRI were respectively 91.7% (95%CI, 73.0%-99.0%), 85.0% (95%CI, 77.0%-91.0%), and 88.3% (95%CI, 81.9%-92.7%), not significantly different from CT with respective values of 94.3% (95%CI, 84.3%-98.8%), 88.8% (95%CI, 83.2%-93.0%) and 93.1% (95%CI, 89.0%-95.7%). With intention-to-diagnose method, diagnostic performance of US was significantly lower than MRI and CT (p<0.01), with sensitivity of 61.5% (95%CI, 51.5%-70.9%), specificity of 18.2% (95%CI, 14.2%-22.7%), and diagnostic yield of 29.7% (95%CI, 25.6%-34.1%). Mean wait times with MRI as initial modality (n=21, 3.5%, 100.6 minutes) was not significantly different from CT (n=133, 22.2%, 104.3 minutes, p=0.78) or US (n=238, 39.7%, 125.6 minutes, p=0.29). Imaging routes involving multiple modalities had significantly longer wait times than routes where patients experienced single modality (p<0.01).

**CONCLUSION**: Diagnostic performance of MRI is superior than US, and comparable to gold standard of CT. With favourable wait times, MRI may have the clinical utility as initial investigation modality for suspected acute appendicitis.

Themes:
Check (highlight) the most applicable theme according to the abstract.

- Innovation and Technology
- Health and Wellness
- Culture and Society
- Sustainability and Conservation

Comments:
Consider including more background information to make a compelling case for your research with a nonspecialist in your field in mind (e.g. why would they care to hear about your study?). Please remove headings – just think of one paragraph that flows from one section to another. Please define superior and gold standard in specific terms.