Post-Operative Gastrointestinal Telemetry with an Acoustic Biosensor Predicts Ileus vs. Uneventful GI Recovery

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ABSTRACT

Background: Postoperative ileus (POI) can worsen outcomes, increase cost and prolong hospitalization. We previously found that a disposable, non-invasive **A**coustic **G**astro-**I**ntestinal **S**urveillance (**AGIS**) biosensor distinguishes healthy controls from patients recovering from abdominal surgery. Here we tested whether AGIS can prospectively predict which patients will develop POI in a multicenter study.

Study Design: AGIS is a disposable device embedded with a microphone that adheres to the abdominal wall and connects to a computer that measures acoustic intestinal rate (IR), defined as motility events/minute. We applied AGIS for 60 minutes before and continuously after abdominal surgery. Clinicians blinded to AGIS recordings clinically separated patients into those with vs. without POI. We used receiver operating characteristic curve analysis to calculate sensitivity, specificity, and negative predictive value (NPV) of AGIS to predict POI.

Results: There were 28 subjects; 9 developed POI. Median IR was 3.01/minute and 4.46/minute between POI and non-POI groups, respectively (P=0.03). AGIS predicted POI onset with a sensitivity, specificity and NPV of 63%, 72% and 81%, respectively.

Conclusion: Non-invasive, abdominal, acoustic monitoring prospectively predicts POI. Surgeons may use AGIS to rule-out POI with over 80% certainty; this offers added confidence to advance feeding earlier in those for whom it is safe.