

# Change in Severity of Abdominal Pain and Flatulence During Lactulose Breath Testing Associated With Positive Small Intestinal Bacterial Overgrowth Diagnosis



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## BACKGROUND

- Small intestinal bacterial overgrowth (SIBO) can be indirectly diagnosed by assessing expired hydrogen and methane gas peaks during lactulose breath testing (LBT).
- Ingestion of lactulose for the test can induce gastrointestinal symptoms, some of which mimic the patient's baseline SIBO symptoms.

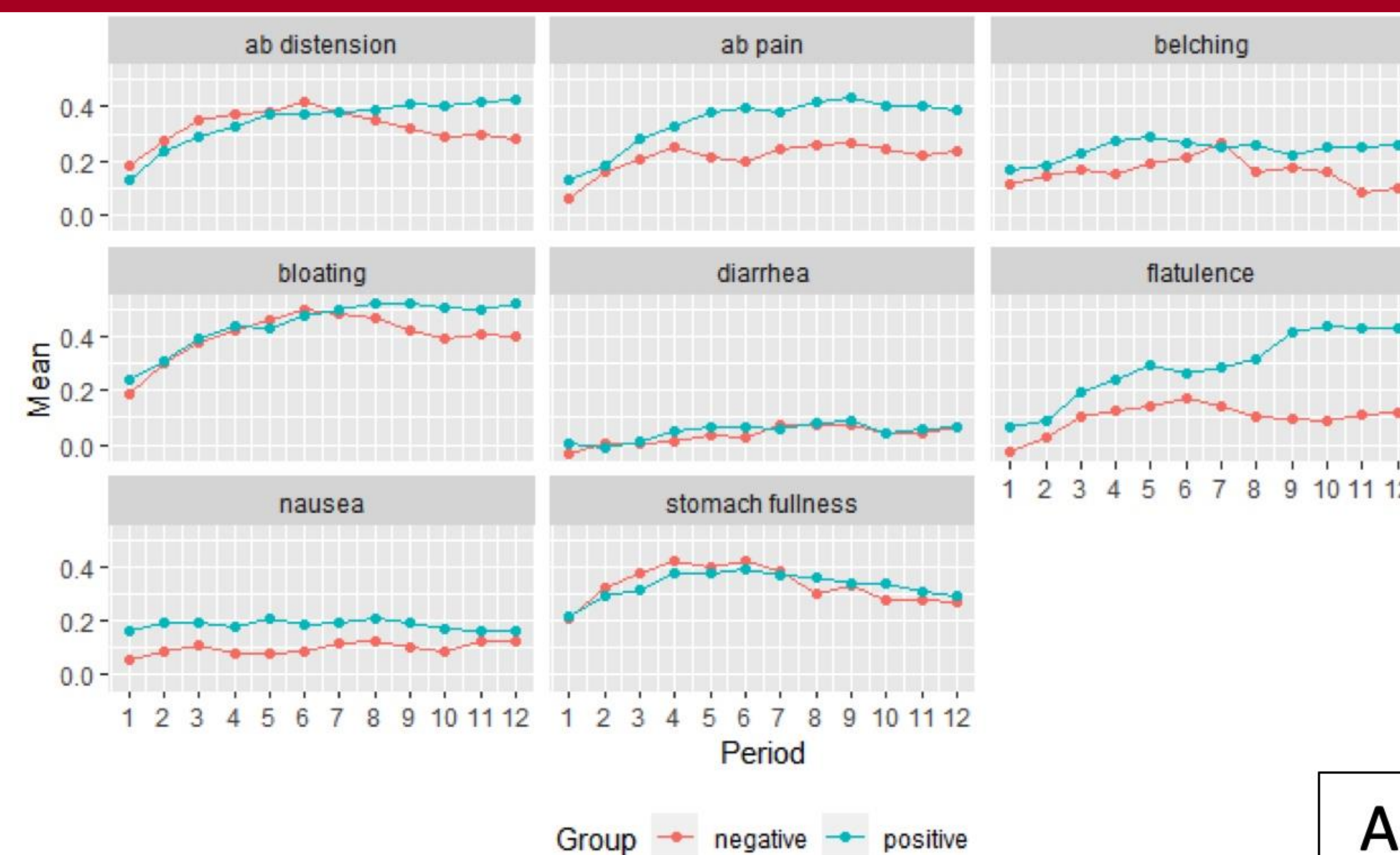
## AIMS

We sought to evaluate whether symptoms that develop during the lactulose breath test predicted the ultimate test result.

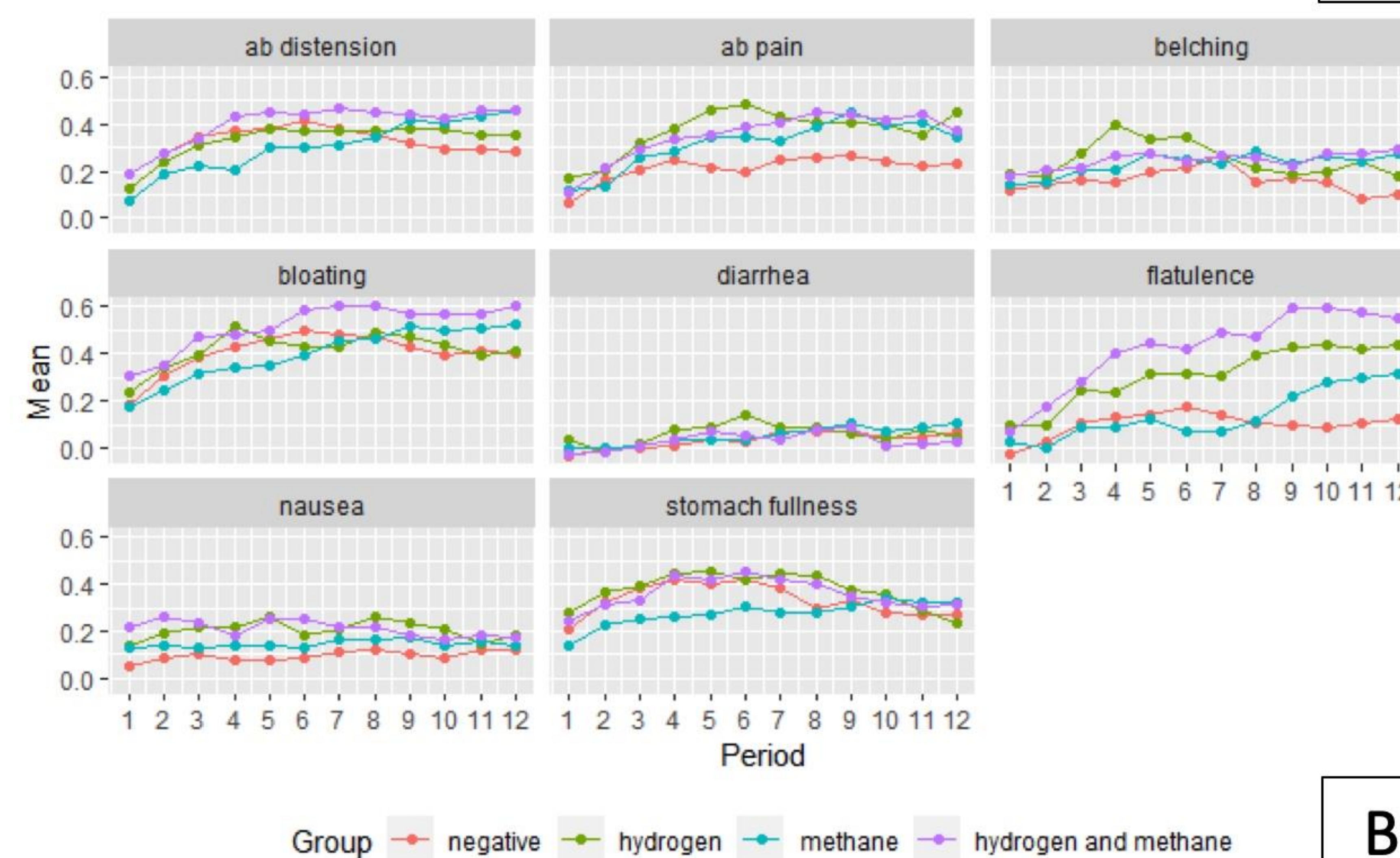
## MATERIALS & METHODS

- Patients that underwent LBT between 11/2018 to 3/2020 were included.
- LBT was performed using the BreathTracker Analyzer (QuinTron Instruments).
- SIBO by hydrogen (H-SIBO) was defined as a rise of 20 ppm within the first 90 minutes. SIBO by methane (M-SIBO) was defined as a peak value of >10ppm.
- Patients answered pretest questionnaires of baseline demographics, Patient Assessment of Gastrointestinal Disorders- Symptom Severity Index (PAGI-SYM), and their symptom severity of eight SIBO symptoms (abdominal distension, abdominal pain, belching, bloating, diarrhea, flatulence, nausea, and stomach fullness). During LBT, patients then re-scored their 8 symptoms at 15-minute increments for the 3-hour test duration. Longitudinal symptom severity over this duration was analyzed with a series of two-level mixed effects regressions estimated for each symptom separately.

## RESULTS



**A**



**B**

**Figure 1. (A)** Mean change in reported symptom severity over twelve 15-minute increments in lactulose breath testing corrected for baseline severity **(B)** Mean change in reported symptom severity over twelve 15-minute increments in lactulose breath testing corrected for baseline severity with positive group stratified by respiratory gas

## RESULTS

- 608 patients underwent LBT yielding 103 H-SIBO, 144 M-SIBO, and 141 positives by hydrogen and methane (HM-SIBO).
- Baseline PAGI-SYM analysis revealed increased symptom severity in the SIBO negative group in nausea ( $p=0.009$ ), upper abdominal pain ( $p=0.02$ ), upper abdominal discomfort ( $p=0.01$ ), and lower abdominal discomfort ( $p=0.02$ ).
- Parameter estimates of the mixed models demonstrated significant difference in the SIBO positive and SIBO negative groups in abdominal pain ( $+0.131$ ,  $p < 0.05$ ) and flatulence ( $+0.190$ ,  $p < 0.01$ ) out of 8 symptoms assessed, presenting early into the testing period.
- Subgroup analysis revealed H-SIBO and HM-SIBO groups had increases in flatulence severity compared to the negative group by 0.213 ( $p < 0.01$ ) and 0.323 ( $p < 0.01$ ), respectively.

## SUMMARY / CONCLUSIONS

- Lactulose breath testing can be utilized to diagnose SIBO
- Over the duration of the LBT patients may develop symptoms that mimic their symptoms of SIBO
- Despite initially reporting lower baseline PAGI-SYM symptom severity, patients with SIBO developed more abdominal pain compared to their SIBO negative counterparts over the course of the LBT
- H-SIBO and HM-SIBO was also associated with greater development of flatulence during testing.
- These results indicate *change in symptoms severity* during LBT may be associated with a positive test result in SIBO lactulose breast testing