**INTRODUCTION**

- Breath tests are a useful and non-invasive tool for the diagnosis of carbohydrate malabsorption (CM) syndromes such as lactose and fructose malabsorption/interolerance.
- The acquisition parameters and interpretation of breath testing data for the assessment of CM varies widely between centres throughout the UK.
- The recently published North American Consensus (NAC) document on hydrogen and methane-based breath testing (HMBT) was a first attempt to standardise this diagnostic test.\(^1\)
- The NAC proposed several key recommendations for CM breath testing:\(^1\)
  - Extend the minimum period of post ingestion breath sampling from 120 to 180-minutes.
  - Exclude the presence of Small Intestinal Bacterial Overgrowth (SIBO) prior to CM testing.
  - Dosage of substrate for fructose and lactose should be 25g in one cup of water.
  - To examine the impact of these recommendation results we retrospectively assessed our breath test database of CM studies from the previous 12-months.

**METHODS**

- In total 200 subjects were analysed (120-lactose and 80-fructose) from our breath test database between July 2016 and September 2017.
- If the subject had more than one CM breath test only the first was included in the data analysis.
- Patient data was retrospectively attributed to 120-min and 180-min groups for both lactose and fructose breath tests.
- Subjects followed a strict 12h low fibre diet and successive 12h fast prior to carrying out a HMBT.
- All patients provided a baseline sample prior to ingestion of, substrate being 25g of lactose or fructose and 10g of lactulose or 75g of glucose for CM and SIBO, respectively.
- A rise in hydrogen ≥20 ppm above baseline was considered positive for CM.\(^1\)
- A positive test for SIBO was determined by a rise in hydrogen ≥10 ppm above baseline within 60 minutes after ingestion of substrate.
- Data was analysed statistically using descriptive statistics and association between SIBO and an early CM-positive result was analysed using Pearson’s chi-squared test.

**RESULTS**

- A positive result for CM at 120-min was seen in 27 of 120 (22.5%) subjects for lactose and 33 of 80 (36.3%) subjects for fructose.
- When extended to 180-min the number of positive CM tests increased to 30% and 41.3% for lactose and fructose, respectively.
- Within these groups the significant rise in gas levels occurred at ≤60 minutes after ingestion in 34.3% for lactose and 69.8% for fructose.
- There was a significant association between patients who had a positive breath test for SIBO and a positive breath test for lactose at ≤60 minutes \([\chi^2=5.3, \ p=0.02]\). Findings for fructose were not significant \([\ p=0.05]\).
- The NAC decision to change dosage to 25g could not be assessed because 25g was used as standard for all of our CM tests.

**CONCLUSION**

- Around 20% of the positive results for CM occurred after 120 minutes supporting the NAC position to extend the post ingestion period to at least 180 minutes to avoid false negative studies.
- SIBO may influence CM results for lactose thus a lactulose or glucose HMBT should be performed prior to CM testing to avoid false positive tests, which supports the NAC findings.\(^2\)
- Almost half of the subjects who carried out a fructose malabsorption HMBT were positive for fructose maldigestion. Furthermore, 70% of this sub-group had positive result within 60 min of ingestion, but this was not associated with SIBO, as similar studies have shown.\(^3\) The relationship between the high prevalence of fructose intolerance, transit time and intestinal microbiota requires more research.
- Like the first iteration of the Chicago Classification for oesophageal motility testing – the NAC on breath testing represents a positive first step in standardising diagnostic breath testing.

**REFERENCES**