The Use of Mean Nocturnal Baseline Impedance for Aiding in Reflux Disease Diagnosis and Etiology Evaluation

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BACKGROUND

- GERD is a common chronic digestion disorder throughout the world, with the prevalence estimated to be around 18%-28%.[1]
- Traditional modes of diagnoses: esophagogastroduodenoscopies (EGD), esophageal manometry, and esophageal pH monitoring are the common studies used to evaluate GERD.
- While these studies are helpful, they are not always conclusive.

AIM

- To determine if MNBI, a novel MII-pH testing variable, can aid in determining the etiology of the GERD symptoms, the specific phenotype of GERD, and if the patient will be responsive to PPI therapy or not.

METHODS

- Retrospective study on patients who had an endoscopy and 24hr multichannel intraluminal impedance-pH (MII-pH) between January 2018 to October 2021.
    - Patient EGD results were used to determine if erosive or nonerosive esophagitis was present.
    - MII-pH findings were used to determine MNBI value, PPI therapy response, number of total reflux events, and esophageal acid exposure time for our results.

RESULTS

Endoscopy and MII-pH Findings

	NERD	ERD	p-value
EGD Diagnosis	527	73	
Mean MNBI	3.27	1.98	<0.0001
Number of Reflux Episodes	61.7	70.8	0.0859
Acid Exposure Percentage	7.45	12.81	<0.0001

RESULTS Continued

Table 2: Data for medicated pH-positive NERD patients and medicated pH-negative patients.

Variable	AET of 4.2% Cutoff		AET of 6% Cutoff		p-value
	pH-positive NERD N = 153	pH-negative N = 163	pH-positive NERD N = 121	pH-negative N = 195	
MBNI Value (kOhm)	2.80	3.70	2.70	3.62	< 0.0001
Total Acid Exposure Time	13.6	1.67	15.9	2.21	< 0.0001
Abnormal MNBI Value (kOhm)					< 0.0001
MNBI < 2.292	60	24	53	31	
MNBI ≥ 2.292	93	139	68	164	
Response to PPI Therapy					0.0979
No or poor	60	49	51	58	
Near max or good	93	114	70	137	

Table 3: Data for non-medicated pH-positive NERD and non-medicated pH-negative patients.

Variable	AET of 4.2% Cutoff		AET of 6% Cutoff		p-value
	pH-positive NERD N = 120	pH-negative N = 91	pH-positive NERD N = 98	pH-negative N = 113	
MBNI Value (kOhm)	2.06	3.54	1.92	3.37	< 0.0001
Total Acid Exposure Time	14.4	1.61	16.6	2.21	< 0.0001
Abnormal MNBI Value (kOhm)					< 0.0001
MNBI < 2.292	81	17	69	29	
MNBI ≥ 2.292	39	74	29	84	

Table 4: Data for medicated patients with pH-positive ERD and pH-negative ERD.

Variable	AET of 4.2% Cutoff		AET of 6% Cutoff		p-value
	pH-positive ERD N = 33	pH-negative ERD N = 9	pH-positive ERD N = 30	pH-negative ERD N = 12	
Total Acid Exposure Time	15.5	1.28	16.6	2.16	< 0.0001
Abnormal MNBI Value (kOhm)					0.0050 0.0056
MNBI < 2.292	28	3	26	5	
MNBI ≥ 2.292	5	6	4	7	

CONCLUSION

- pH positive NERD patients were more likely to have abnormal MNBI values than pH negative NERD patients.
- Patients without ERD, who were pH-negative, were more likely to have a normal MNBI value indicating functional heartburn.
- Additionally, an abnormal MNBI value correlated well with a patient being pH positive if ERD was present.
- The correlation with MNBI values and total acid exposure time is consistent with previous studies.[2,3]
- This study additionally showed the benefit of using MNBI values to help distinguish between the phenotypes of of reflux disease and also the etiology of the heartburn, which is a new finding and promising for future utilization in GERD diagnosis

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