

Supplementary Table 1. MII-pH parameters in study 1

	Rumination (n=28)	GERD (n=30)	HC (n=27)	P value
24 hs parameters				
Total AET (%)	3.3 [1.6, 6.0]	1.5 [0.4, 9.5]	0.3 [0, 0.5]	0.004
Upright AET (%)	5.5 [2.1, 7.6]	1.4 [0.6, 6.9]	0.3 [0.1, 0.6]	<0.001
Recumbent AET (%)	0.2 [0, 1.3]	0 [0, 1.2]	0 [0, 0.1]	0.061
Total RE	79.5 [65.0, 105.8]	27.5 [14.0, 45.8]	31.0 [16.0, 41.0]	<0.001
Acid RE	48.5 [35.5, 73.8]	19.0 [7.8, 35.5]	9.0 [6.0, 15.0]	<0.001
Non-acid RE	30 [19.0, 50.0]	6.5 [3.8, 12.8]	17.0 [8.0, 27.0]	<0.001
Recumbent RE	2.0 [1.0, 4.0]	1.0 [0, 2.8]	1.0 [0, 3.0]	0.204
Proximal RE	55.5 [43.5, 85.3]	9.0 [5.8, 34.5]	11.0 [3.0, 14.0]	<0.001
Proximal acid RE	35.0 [25.5, 58.0]	8.5 [3.0, 19.8]	3.0 [1.0, 7.0]	<0.001
Proximal non-acid RE	19.0 [9.3, 34.3]	2.0 [0, 5.5]	6.0 [2.0, 9.0]	<0.001
Total bolus exposure (%)	2.0 [1.3, 2.3]	0.8 [0.4, 1.9]	0.5 [0.2, 0.9]	0.008
MNBI, channel 5 (ohm)	2567.5 (949.8)	2414.0 (1081.3)	2533.0 (642.8)	0.802
MNBI, channel 6 (ohm)	2474.5 (881.5)	2443.5 (1310.7)	2716.6 (714.6)	0.548
Postprandial parameters				
AET (%)	6.2 [1.4, 9.5]	1.9 [0.2, 8.8]	0.1 [0, 0.7]	0.001
RE / h	14.3 [10.1, 21.6]	3.6 [2.3, 6.5]	3.7 [2.0, 5.5]	<0.001
Acid RE / h	6.7 [4.7, 10.1]	1.8 [1.0, 4.1]	0.7 [0.3, 1.7]	<0.001
Non-acid RE / h	7.8 [4.3, 10.6]	0.9 [0.5, 2.6]	2.7 [1.3, 4.7]	<0.001
Bolus exposure (%)	3.7 [3.0, 4.7]	2.5 [1.3, 4.0]	1.2 [0.9, 3.0]	0.067
Total number of symptoms preceded by reflux	13.5 [4.3, 24.8]	0.5 [0, 2.3]	-	<0.001
Percentage of total symptom preceded by reflux (%) (SI)	88.8 [76.9, 100]	25.0 [0, 75.0]	-	<0.001
Percentage of total reflux followed by symptom (%) (SSI)	41.6 [10.3, 63.2]	7.7 [0, 23.6]	-	<0.001
Time lapse between start of reflux and symptom (sec)	7.3 [3.6, 17.7]	15.5 [11.2, 59.1]	-	0.008
PSPW Index (%)	55.6 (17.9)	42.7 (25.5)	48.5 (19.8)	0.042
SGB / h	1.4 [0.1, 8.1]	1.0 [0.3, 3.1]	0.3 [0, 1.3]	0.01

Data is shown as mean ± SD or median [inter-quartile range];

MI, multiple intraluminal impedance; GERD, gastroesophageal reflux disease; HC, healthy controls; AET, acid exposure time; RE, reflux event; MNBI, mean nocturnal baseline impedance; SI, Symptom Index; SSI, Symptom Sensitivity Index; PSPW, post-swallow peristalsis wave; SGB, supragastric belch.

Supplementary Table 2. The accuracy to predict rumination in MII-pH parameters in study 1

	Sensitivity	Specificity	AUC (95% CI)	Likelihood ratio
24hs parameters				
Total AET (%)	96.4	26.7	0.60 (0.44, 0.76)	1.87
Upright AET (%)	92.9	53.3	0.69 (0.55, 0.84)	0.28
Recumbent AET (%)	100	10.0	0.57 (0.43, 0.71)	1.80
Total RE	100	76.7	0.85 (0.73, 0.96)	13.03
Acid RE	75.0	80.0	0.77 (0.63, 0.90)	3.19
Non-acid RE	92.9	76.7	0.89 (0.80, 0.97)	28.51
Recumbent RE	100	13.3	0.63 (0.48, 0.77)	1.15
Total Proximal RE	100	73.3	0.86 (0.75, 0.97)	20.12
Proximal acid RE	89.3	76.7	0.79 (0.66, 0.93)	8.69
Proximal non-acid RE	85.7	76.7	0.88 (0.80, 0.97)	28.41
Total bolus exposure (%)	100	56.7	0.74 (0.60, 0.88)	0.07
MNBI, channel 5 (ohm)	82.1	37.9	0.53 (0.38, 0.69)	0.33
MNBI, channel 6 (ohm)	92.9	24.1	0.53 (0.38, 0.68)	0.01
Postprandial parameters				
AET (%)	100	10.0	0.60 (0.45, 0.75)	0.02
Total RE / h	96.4	83.3	0.90 (0.81, 0.99)	25.41
Acid RE/ h	82.1	76.7	0.80 (0.67, 0.92)	5.87
Non-acid RE / h	85.7	80.0	0.90 (0.83, 0.98)	36.59
Bolus exposure time (%)	100	10.0	0.71 (0.57, 0.85)	0.07
Total number of symptoms preceded by reflux	82.1	90.0	0.86 (0.76, 0.96)	25.56
Percentage of total symptom related to reflux (%) (SI)	92.3	68.0	0.82 (0.69, 0.94)	20.22
Percentage of total reflux related to symptom (%) (SSI)	64.3	86.2	0.80 (0.69, 0.92)	17.4
Time lapse between start of reflux and symptom (sec)	96.2	46.7	0.75 (0.59, 0.91)	11.22
PSPW Index (%)	60.7	72.4	0.68 (0.54, 0.82)	4.80
SGB / h	25.0	100	0.57 (0.43, 0.71)	6.72

MII, multiple intraluminal impedance; AUC, area under the curve; AET, acid exposure time; RE, reflux event; MNBI, mean nocturnal baseline impedance; SI, Symptom Index; SSI, Symptom Sensitivity Index; PSPW, post-swallow peristalsis wave; SGB, supragastric belch;