

Dear Doctor,

Greetings from Micro Labs limited. We are happy to bring you “**ENTERON**” which contains latest and interesting news in the field of Gastroenterology.

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Best Regards,

Medical Team, Micro Labs Ltd

A Study Using Concurrent Monitoring of Sleep Position, Esophageal pH, and Impedance to Examine Associations between Sleep Position and Nocturnal Gastroesophageal Reflux

Heartburn and reflux of stomach contents into the oropharynx are symptoms of gastroesophageal reflux disease (GERD), a common gastrointestinal motility problem. The failure of the lower esophageal sphincter is the most common cause of gastroesophageal reflux. It's also possible that it's linked to a number of other physiological and pathological issues. The most common physiological explanation is the hypotensive lower esophageal sphincter (LES's) short relaxations. Reduced LES pressure and delayed gastric emptying are two further reasons.¹ Up to 80% of people with gastroesophageal reflux disease suffer bothersome symptoms at night, which can interfere with sleep quality. In comparison to the left lateral decubitus position, the right lateral decubitus posture is related with a longer esophageal acid exposure period in healthy volunteers, newborns, and patients with gastroesophageal reflux disease. However, because these small sample size investigations were conducted during the daytime while awake, only focused on the postprandial period or without pH-impedance technology, they used experimental circumstances that did not reflect the night.²

The aim of this study was to combine pH-impedance and sleep position monitoring in a large prospective cohort of patients with reflux symptoms to examine the effect of spontaneous sleep positions on the development of nocturnal gastroesophageal reflux.

Adult patients who had been prescribed ambulatory pH impedance monitoring for the examination of reflux were included in the study. A sleep position measurement device was also implanted in the patients (measuring the sleep position in a 10-second interval). Patients were included if their esophageal acid exposure was greater than 0.5 percent in the supine position. The composition (liquid or mixed liquid-gas), type (acid or mildly acid), and proximal extent of each nocturnal reflux episode, as well as sleep position (left, right, supine, and prone), were all evaluated for each nocturnal reflux episode. For categorical data, descriptive statistics were expressed as a percentage, a mean with standard deviation (SD), or a median with P25-P75 for continuous variables.

There were 57 patients in total. The left lateral position (median 0.0 percent, P25–P75, 0.0 percent –3.0 percent) had a significantly shorter acid exposure time than the right lateral position (median 1.2 percent, 0.0 percent –7.5 percent, $P = 0.022$) and the supine position (median 0.6 percent, 0.00 percent –8.3 percent, $P = 0.022$). [Fig.1] In

comparison to the supine (median 76 seconds, 22–257 seconds, $P = 0.030$) and right lateral positions (median 90 seconds, 26–250 seconds, $P = 0.002$), the esophageal acid clearance time was substantially shorter in the left lateral decubitus position (median 35 seconds, 16–115 seconds). [Fig.2]

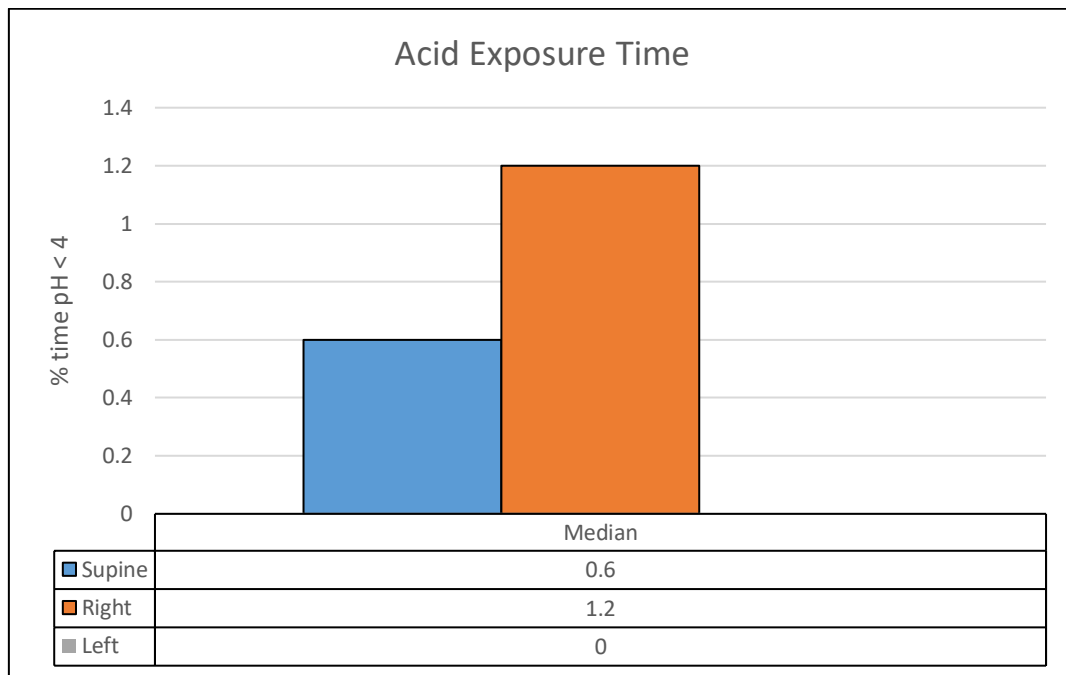


Fig. 1: From the graph it was observed that there was a significantly shorter acid exposure time in the left lateral position compared with right and supine position

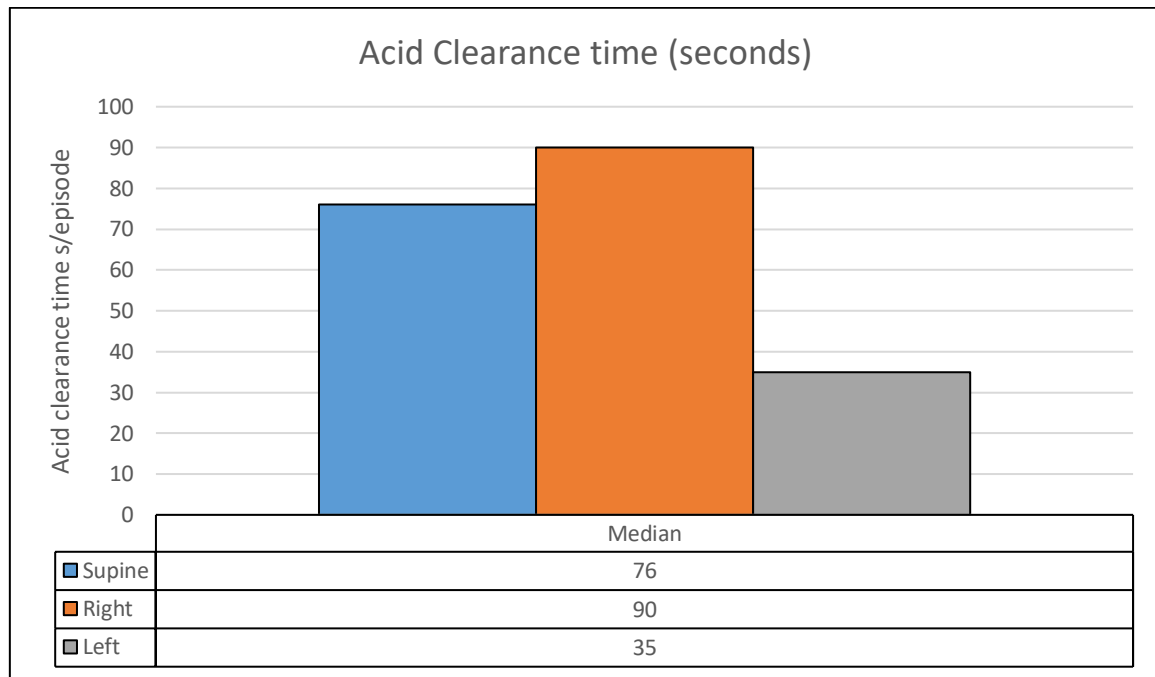


Fig 2: Esophageal acid clearance time was significantly shorter in the left lateral decubitus position

In comparison to the supine and right lateral decubitus postures, the results of this study show that the left lateral decubitus position is related with much shorter nocturnal esophageal acid exposure time and faster esophageal acid clearance.² Oude Nijhuis RAB et al. In at least one night of the prolonged pH recording, the majority of patients with nocturnal reflux symptoms had pathological acid exposure. The clinical utility and diagnostic yield of pH monitoring limited to 24 hours is reduced due to a substantial night-to-night variability in acid exposure. For patients with night time reflux symptoms, prolonged testing is a better diagnostic tool.³ Patients will have a significantly lower acid exposure time if time spent in the right lateral and supine sleep positions can be reduced or avoided entirely, according to the findings of this study, which may result in less esophageal damage and fewer nocturnal reflux symptoms

In comparison to the supine and right lateral decubitus positions, the left lateral decubitus position is associated with significantly shorter esophageal acid exposure time and faster esophageal acid clearance.

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Lectin Microarray Analysis of Changes in Gastric Mucosal Glycosylation Before and After *Helicobacter pylori* Eradication

Helicobacter Pylori (*H. Pylori*) is a spiral-shaped gram-negative bacteria that is urease-producing, oxidase-producing, and catalase-producing. *H. Pylori* is linked to poverty, with an estimated prevalence of 70% in LMICs compared to a maximum of 40% in wealthy nations, with *H. Pylori* positivity in more than 95% of duodenal ulcer cases and 70–80% of stomach ulcer cases.¹ Glycosylation is a common post-translational modification, and it has been linked to cell proliferation, differentiation, and carcinogenesis through changes in glycosylation patterns on cells and certain glycotransferases. There have been no reports of alterations in glycosylation patterns following *H. pylori* eradication to yet. In this study, a lectin microarray technology was utilised to compare glycosylation patterns on cells before and after *H. pylori* eradication to uncover glycosylation patterns.²

Gastric mucosal samples were taken from 10 non-infected *Helicobacter pylori* patients, 10 *H. pylori*-infected patients, and 10 *H. pylori*-eradicated patients who underwent gastric mucosal biopsy by endoscopy at the institute [Table 1]. The lectin microarray was used to extract lectin–glycan interaction values from gastric gland cells isolated from formalin-fixed, paraffin-embedded gastric mucosal biopsy samples using laser capture microdissection.

The lectin - glycan interaction values in the same patients before and after eradication shows significant increase in *Ricinus communis* agglutinin 120, *Trichosanthes japonica* agglutinin II, *Euonymus europaeus* lectin, *jacalin*, *Amaranthus caudatus* agglutinin, and *Maclura pomifera* agglutinin and significant decreases for *Urtica dioica* agg Furthermore, *jacalin* and *Maclura pomifera* agglutinin (MPA) levels in the stomach antrum were considerably lower with *H. pylori* infection compared to the control group, but returned to pre-infected levels

after eradication. The levels of *Lycopersicon esculentum* lectin (LTL), *Sambucus nigra* agglutinin (SNA), *Sambucus sieboldiana* agglutinin (SSA), and *Trichosanthes japonica* agglutinin I (TJA-1) in the stomach body were dramatically raised with *H. pylori* infection and then returned to normal after eradication.

	Without Infection	Before Eradication	After Eradication	P
Number of patients	10	10	10	
Gender (male)	5	5	5	
Age (years)	60 ±13.06	56.3 ± 12.72	57.4 ± 12.71	0.265, 0.329
Endoscopic findings				
Reflux esophagitis	2	0	0	
Chronic gastritis	4	10	10	
Gastric ulcer, duodenal ulcer	0	0	0	
Gastric cancer	0	0	0	
Histological atrophy score				
Antrum	0.4 ± 0.490	1.3 ±0.458	0.9 ± 0.700	< 0.001, 0.169, 0.096
Body	0	0.8 ± 0.600	0	< 0.001, < 0.001
Inflammation score				
Antrum	1.0	2.7 ±0.458	1.8± 0.400	< 0.001, < 0.001, <0.001
Body	1.0	2.5 ±0.671	1.4± 0.490	< 0.001, < 0.001, 0.025
Activity score				
Antrum	0.1 0.30	1.6 ±0.663	0	<0.001, <0.001, 0.331
Body	0	1.4± 0.800	0.1± 0.3	<0.001, <0.001, 0.331

Table 1: Baseline Characteristics and Histological Scores

Lectin microarrays are well-known as effective analytical tools for determining the type and state of cells. This is a technique that allows for rapid quantitative examination of a sample's glycome, or entire glycan profile.³ LCM was employed to harvest gastric epithelial cells in this work to limit the effects of glycans on the surface of inflammatory cells. The signals of jacalin and MPA in the gastric antrum were observed to be significantly lower in the *H. pylori* infection group than in the gastric mucosa of the group without *H. pylori* infection, and that the signals rebounded to the levels seen without infection 1 year after eradication. Furthermore, in the *H. pylori*

infection group, LTL, SNA, SSA, and TJA-I signals in the gastric body were dramatically enhanced and reverted to pre-infected levels 1 year after eradication. These alterations were identical to those seen in *H. pylori* infection, as shown by the inflammation and activity ratings, implying that *H. pylori* infection can be reversed. The results of this investigation demonstrated that after *H. pylori* eradication, the signal levels for lectin binding to glycans caused by *H. pylori* infection reverted to pre-infection levels. As a result, the findings are noteworthy because they suggest that glycosylation can be reversed.²

Infection with *H. pylori* alters lectin binding, which has been linked to a variety of malignancies of the stomach mucosal cell. Furthermore, *H. pylori* eradication can reverse those alterations.

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Sigmoidoscopy's efficacy in assessing disease activity in ulcerative colitis patients

Ulcerative colitis (UC) is a recurrent and remitting inflammatory bowel disease that causes persistent mucosal inflammation in the large intestine. Although the specific aetiology and pathophysiology of UC are unknown, dysregulation of the mucosal immune response to intestinal bacteria plays a critical role in its pathogenesis.¹ Because of the significant risk of perforation in severe inflammation, most guidelines recommend sigmoidoscopy for endoscopic assessment; however, there is no clear advice as to whether sigmoidoscopy or colonoscopy is required in most other instances. As a result, the aim of this study was to look at patients with ulcerative colitis who had a follow-up colonoscopy to see if sigmoidoscopy alone could represent the degree of inflammation throughout the colon.²



Ulcerative colitis

Patients with ulcerative colitis whose disease activity was assessed using colonoscopy were included in this retrospective multicenter investigation. Only patients who had their colonoscopy with the cecum intubated were included in the study. Colonoscopy images were evaluated for each segment to assess endoscopic disease activity. The ulcerative colitis endoscopic disease activity was assessed using the Mayo endoscopic subscore (MES) and the Ulcerative Colitis Endoscopic Index of Severity (UCEIS). The MES scale runs from 0 to 3, with 0 denoting a normal or inactive condition and 3 denoting a very active state. The UCEIS is divided into three subcategories: vascular pattern, bleeding, and erosion and ulcer, with a score of 0–2 for vascular pattern, 0–3 for bleeding, and 0–8 for erosion and ulcer, for a total score of 0–8. The highest score for each segment is reflected in the overall score for both MES and UCEIS. To determine the usefulness of sigmoidoscopy, the highest MES and UCEIS in the rectosigmoid and proximal regions were compared.

A total of 500 colonoscopic examinations were enrolled from 333 individuals. MES and UCEIS scored more severely in the proximal colon in just 7.6% [k(kappa): 0.893, r(Spearman): 0.906, $p < 0.001$] and 8.6% [k(kappa): 0.890, r(Spearman): 0.914; $p < 0.001$] of cases, respectively. The rate of concordance between active disease ($MES \geq 2$) in the rectosigmoid area and the overall colon was high [k(kappa): 0.899, r(Spearman): 0.904, $p < 0.001$]. Sigmoidoscopy and colonoscopy showed high concordance rates [k(kappa): 0.899, r(Spearman): 0.904, $p < 0.001$], and high concordance rates between sigmoidoscopy and colonoscopy were confirmed when classified by disease activity according to the UCEIS [k(kappa): 0.918, r(Spearman): 0.921, $p < 0.001$] [Table 3].

The concordance rate for endoscopic healing (MES=0) was also high [k(kappa): 0.882, r(Spearman): 0.887, $p < 0.001$] [Table 4]. Patients with past severe colitis had a substantially greater MES in 38 cases (7.6%) of patients with a higher MES in the proximal region.

Active disease (MES $\geq$ 2) N=500		Colonoscopy		Active disease (UCEIS $\geq$ 5) N=500		Colonoscopy	
		Yes	No			Yes	No
Sigmoidoscopy	Yes	164	0	Sigmoidoscopy	Yes	83	0
	No	23	313		No	12	405
k(kappa)=0.899, r(spearman)=0.904, $p < 0.001$				k(kappa)=0.918, r(spearman)=0.921, $p < 0.001$			

Table 3: Comparison of the concordance rates of active disease assessed by sigmoidoscopy and colonoscopy

Endoscopic healing (MES = 0) N=500		Colonoscopy		Endoscopic healing (UCEIS $\leq$ 1) N=500		Colonoscopy	
		Yes	No			Yes	No
Sigmoidoscopy	Yes	130	23	Sigmoidoscopy	Yes	172	20
	No	0	347		No	0	308
k(kappa)=0.899, r(spearman)=0.904, $p < 0.001$				k(kappa)=0.918, r(spearman)=0.921, $p < 0.001$			

Table 4: Comparison of the concordance rates of endoscopic healing assessed by sigmoidoscopy and colonoscopy

The study found that the rectosigmoid area and the whole colon had a high level of MES and UCEIS concordance. Endoscopic evaluation is a critical signal in patients with ulcerative colitis for assessing not only the severity of deteriorating symptoms but also mucosal repair as a long-term therapy goal. The findings imply that sigmoidoscopy can be used as a follow-up test to assess disease activity after an ulcerative colitis diagnosis. According to Colombel JF et al, there is a significant degree of concordance between rectosigmoidoscopy and colonoscopy assessments of UC activity. Colonoscopy revealed persisting proximal lesions in the placebo group for endoscopic healing (MCSe $\leq$ 1), which influenced efficacy analyses. The agreement between rectosigmoidoscopy and colonoscopy was practically perfect when endoscopic healing was defined as MCSe of 0.^{2,3}

The concordance rate between sigmoidoscopy and colonoscopy was high. As a result, sigmoidoscopy is regarded a viable alternative to colonoscopy. Patients with previous severe colitis, on the other hand, should consider a colonoscopy.

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A case report of a hazardous instance of sudden extensive upper gastrointestinal haemorrhage

Upper gastrointestinal (UGI) bleeding is a serious acute condition with four primary causes: esophageal variceal bleeding, peptic ulcer (PU) bleeding, gastric cancer bleeding, and acute erosive hemorrhagic gastritis, all of which require urgent diagnosis and treatment. In emergency rooms, upper gastrointestinal bleeding is a common occurrence. It remains a potentially life-threatening occurrence, despite amazing advances in medical therapies and endoscopic interventions. Acute UGIB patients have a mortality rate that can range from 2 to 15%. This condition also has a high morbidity rate, since it is one of the primary reasons of hospitalisation for digestive problems, and it continues to be a large and growing economic burden.^{1,2} Arterio-oesophageal fistulas are a rare cause of serious gastrointestinal bleeding, and they usually occur as a result of an abnormal right subclavian artery, mediastinal surgery, or extended endotracheal/nasogastric intubation.² An adult case of a mediastinal abscess corroding the Left subclavian artery (LSA) is presented in this paper, resulting in delayed but high-risk severe upper GI haemorrhage.

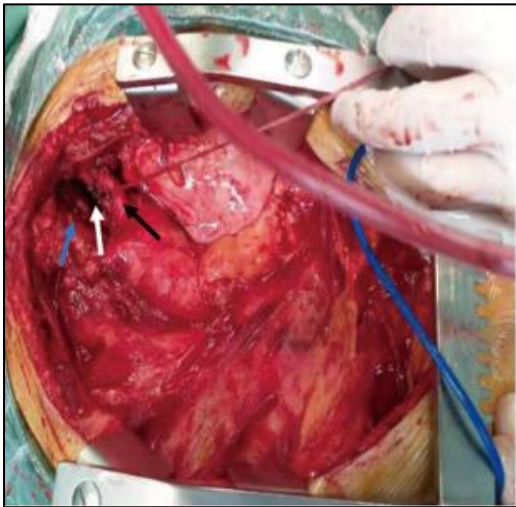


Fig. 3: Image from the surgical operation

A 54-year-old guy was taken to the hospital for 2 hours with hematemesis as his primary complaint. Hematemesis was vivid crimson in colour and had a volume of over 1000 ml. Palpitations, tiredness, and sweating were also present. The patient had a temperature of 36.4 °C, blood pressure of 80/50 mmHg, and a heart rate of 135 bpm when he was admitted. The diagnosis of GI bleeding was made first, and

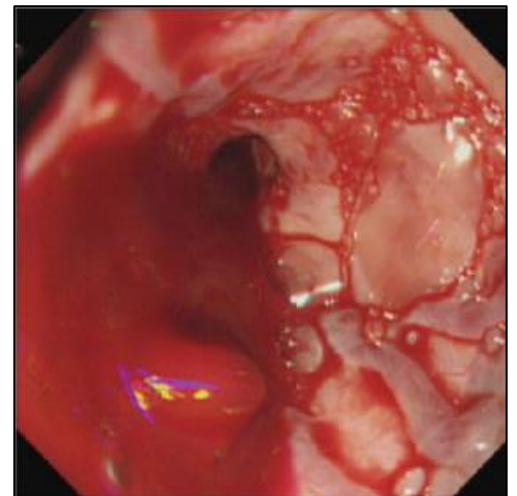


Fig. 4: Active and massive bleeding was detected from the esophageal wall by emergent endoscopy

esomeprazole was given. On admission, CT revealed an obvious rupture on the left side of the esophageal wall, a low-density lesion between the esophageal wall and the LSA, and an ambiguous demarcation between the esophageal wall and the subclavian artery. The active bleeding spot was discovered with a 3 mm breach in the LSA's posterior lateral wall [Fig. 4]. On the other side of the abscess cavity, an esophageal fistula was discovered and corrected during the LSA repair and abscess cavity cleaning [Fig.3]. However, no foreign objects were discovered. The patient was able to recover after receiving quick and excellent therapy. A review of the patient's family history revealed that he had had chest pain and discomfort four days before after eating salmon. Esophageal variceal bleeding, PU-caused haemorrhage, gastric cancer-caused bleeding, and acute erosive hemorrhagic gastritis are the four most common causes of upper GI bleeding. Esophageal bleeding induced by NSAIDs is a rare, nonfatal occurrence that usually occurs as a result of seeping from a superficial esophageal ulcer, and some bleeding can even be seen during an endoscopy. The problem in this case was determining the cause of the bleeding and how to

treat it because the patient's condition was progressing so quickly and dangerously. This instance of delayed but high-risk large upper GI bleeding was caused by a fish bone piercing the oesophagus, generating a mediastinal abscess that corroded the LSA, according to medical history, physiological signs, investigation, and treatment. Fistulas between the subclavian artery and the oesophagus are uncommon, but they can quickly become fatal.^{1,3}

This example demonstrates that medical history, endoscopy, and CT scans, in addition to regular assessment of upper GI bleeding, are useful in determining a diagnosis. Importantly, effective multidisciplinary collaboration can save critically sick patients if it occurs early and frequently. The emergency thoracotomy procedure is still a life-saving procedure.

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