

Enteron

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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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Looking forward to your valuable feedback

Best Regards,

Medical Team, Micro Labs Ltd

Vonoprazan versus lansoprazole in the treatment of artificial gastric ulcers after endoscopic submucosal dissection: a randomized, open-label trial

Background

Endoscopic submucosal dissection (ESD) for early gastric cancer has been widely used and is a well-established procedure. ESD provides higher rate of *en bloc* and R0 resection rate, but occasionally there are few complications, such as bleeding and perforation. Proton pump inhibitors (PPIs) have been widely used for treating ESD-induced gastric ulcers. Although PPIs support to heal such lesions, some ulcers fail to heal; therefore, a more effective therapy is required. Vonoprazan is a novel suppressor of gastric acid secretion and an active potassium-competitive acid blocker (P-CAB). P-CABs inhibit gastric $H^+/K^+ - ATPase$ and also inhibit the enzyme in a K^+ - competitive and reversible manner. This inhibitory effect of vonoprazan is largely unaffected by ambient pH. Therefore, vonoprazan is more potent with a more long-lasting effect and expected to be superior to PPIs, and lead to earlier healing of ESD-induced gastric ulcers.

Aim: To evaluate the effectiveness of vonoprazan in healing artificial ulcers after ESD.

Methods:

Following ESD, patients were randomly assigned to the vonoprazan group (group V) or the lansoprazole group (group L)

Inclusion criteria: Differentiated mucosal cancers without ulceration regardless of the lesion's size; differentiated mucosal cancers ≤ 30 mm with ulcer findings; mucosal cancers with undifferentiated histology ≤ 20 mm without ulceration; adenoma suspicious for mucosal cancers; and neuroendocrine tumors grade 1 ≤ 10 mm confined to submucosal layer.

Exclusion criteria: Remnant stomach, administration of antithrombotic agents, nonsteroidal anti-inflammatory drugs (NSAIDs) and steroids; occurrence of complication during ESD; allergy to lansoprazole or vonoprazan; and unwillingness to participate in the study.

Results:

A total of 168 patients were analysed. The 4 - week healing rate for artificial ulcer was not significantly higher in group V versus group L (17/85, 20.0% vs. 14/83, 16.9%, respectively).

Clinical outcomes of the endoscopic submucosal dissection induced ulcers

	Vonoprazan group n = 85	Lansoprazole group n = 83	P-value
Healing of the artificial ulcer at 4 weeks, n (%)	17 (20.0)	14 (16.9)	0.60
Healing of the artificial ulcer at 8 weeks, n (%)	66 (77.6)	70 (84.3)	0.27
Median shrinkage rate of the artificial ulcer at 4 weeks, % (range)	96.3 (18.2–100)	95.1 (39.3–100)	0.68
Median shrinkage rate of the artificial ulcer at 8 weeks, % (range)	100 (92.7–100)	100 (89.3–100)	0.35
<i>Complications</i>			
Delayed perforation, n (%)	1 (1)	0 (0)	1.00
Post-operative bleeding, n (%)	0 (0)	3 (4)	0.12

No significant differences between the 4-week shrinkage rates between the two groups. Postoperative bleeding occurred in none of the patients in group V and three in group L. One patient in group V presented delayed perforation 2 days after ESD.

Conclusions:

Vonoprazan might not be superior to lansoprazole in the healing of artificial gastric ulcers after ESD in patients without taking antithrombotic agents, NSAIDs and steroids.

Source: Kawai D, et al. Vonoprazan versus lansoprazole in the treatment of artificial gastric ulcers after endoscopic submucosal dissection: a randomized, open-label trial. *BMC Gastroenterol.* 2021 May 22;21(1):236

Gastric emptying in healthy children using the Spirulina breath test: The impact of gender, body size, and pubertal development

Introduction:

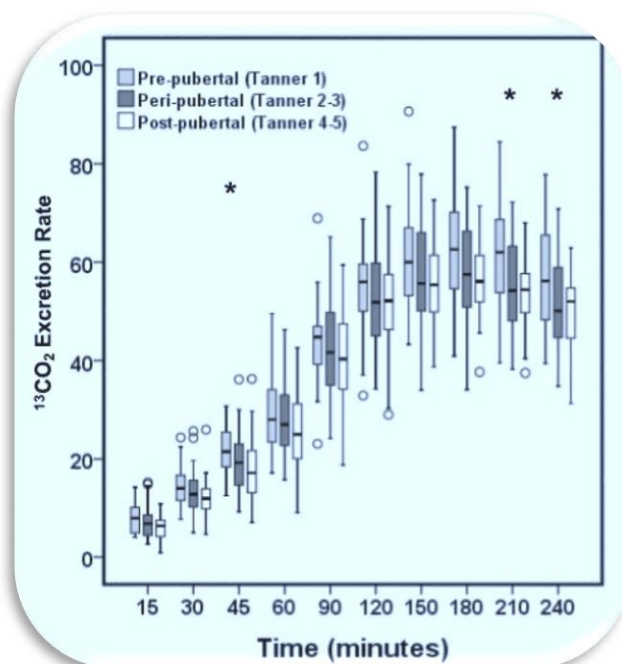
Pediatric gastroparesis is related to broad spectrum of symptoms including post-prandial fullness, nausea, vomiting, bloating, and upper abdominal pain. It's a disabling illness that's challenging to manage, partially due to lack of a reliable diagnostic assay which will predict treatment outcomes. The 4-h nuclear scintigraphy scan remains the foremost common test performed in children presenting with symptoms related to delayed gastric emptying (GE). It's generally considered the gold standard test for diagnosing pediatric gastroparesis despite absence of normative data in healthy children. The gastric emptying breath test (GEBT) uses a stable, present and non-radioactive ^{13}C isotope to live GE of solids. Its advantages over scintigraphy include lack of radiation exposure, low cost, and feasibility to be performed repeatedly within the office setting. The GEBT is therefore particularly attractive to be used in children. The $[^{13}\text{C}]$ -Spirulina platensis GEBT uses a uniform, egg-based test meal mixed with Spirulina algae and ^{13}C . This test has been validated and located to correlate well with nuclear scintigraphy in healthy adults. It provides an indirect assessment of GE because it measures the speed at which $^{13}\text{CO}_2$ is exhaled within the breath. Upon entry into the duodenum, the ^{13}C is rapidly absorbed, enters into portal circulation, and oxidized to $^{13}\text{CO}_2$. the speed of CO_2 appearance in breath (enriched with ^{13}C) is decided by the speed of GE. there's paucity of knowledge on the influence of body mass and gender on GE rates in children and most published evidence conflict with adult data. Some studies using nuclear scintigraphy in symptomatic children have found conflicting correlations between GE and age/size and gender but most data are limited by retrospective study design, small sample size, and therefore the use of adult norms also as adult test meals in young children.

Aim: To determine physiologic ranges of GE in healthy children based on the $[^{13}\text{C}]$ -Spirulina platensis GEBT and examine the influence of age, gender, puberty, and body size on gastric emptying.

Methods: Healthy children ages 8–18 years completed the $[^{13}\text{C}]$ -*Spirulina platensis* GEBT after an overnight fast. Breath samples were collected at baseline, every 15 min $\times$ 1 h, then every 30 min for 4 h total. The $^{13}\text{CO}_2$ excretion rate was determined by the change in $^{13}\text{CO}_2/^{12}\text{CO}_2$ over time in each breath sample, expressed as kPCD (Percent ^{13}C Dose excreted/min). A mixed model with random time was used for multivariable analysis and outcome fit into a quadratic model.

Results: The 100 subjects completed the test meal within allotted time. Median (IQR) age was 13.5 (11.3–15.5) years; 51% were female. Females had lower $^{13}\text{CO}_2$ excretion rates (slower GE) than males across time ($p < 0.001$) while decreased excretion rates correlated with higher BSA ($p = 0.015$).

$^{13}\text{CO}_2$ excretion rate by time and Tanner stage with genders combined ($n = 84$). * p -value < 0.05 comparing pre- and post-pubertal Tanner stages



GI symptom scores

Results of patient assessment of upper gastrointestinal symptom (PAGI-SYM) severity index for healthy children completing test meal in allotted time

PAGI-SYM Subscales	<i>n</i> evaluated	Median (IQR) scores
Nausea/Vomiting	100	0 (0–0.33)
Post-prandial fullness/Early satiety	100	0.25 (0–0.75)
Bloating	100	0 (0–0.50)
Upper abdominal pain	100	0 (0–0)
Lower abdominal pain	100	0 (0–0)
Heartburn/Regurgitation	100	0 (0–0.14)
Total Score	100	0.12 (0–0.35)

The medians (IQR) were substantially lower than published data of patients with gastroparesis³¹ (mean total score 2.21 vs this cohort 0.21), indicating that this healthy population did not have significant gastrointestinal symptoms at the time of testing.

Gender differences were also noted within pubertal stages with females showing slower GE. Multivariable analysis suggested that pre-pubertal children have faster GE than both peri- and post-pubertal groups ($p < 0.0001$).

Conclusions & Inferences: Gender, puberty, and BSA influence GE rates in healthy children more than age. Although further data are needed, pubertal stage and hormonal influences may be unique factors to consider when assessing GE in children.

Keypoints

- *There are no pediatric norms of gastric emptying rates as measured by nuclear scintigraphy. Gastric emptying breath tests are radiation-free alternatives more suitable for children.*
- *This study evaluated gastric emptying rates in healthy children ages 8–18 years using the [13C]-Spirulina platensis gastric emptying breath test.*
- *Gender, size and pubertal development appear to influence gastric emptying rates in healthy children. These may be unique factors to consider in the diagnostic assessment of gastric emptying in pediatric populations*

Source: Kovacic K, Zhang L, Nugent Liegl M, Pawela L, Simpson P, Sood MR. Gastric emptying in healthy children using the Spirulina breath test: The impact of gender, body size, and pubertal development. *Neurogastroenterol Motil.* 2021 Jun;33(6):e14063.

Three-dimensional visualization improves the endoscopic diagnosis of superficial gastric neoplasia

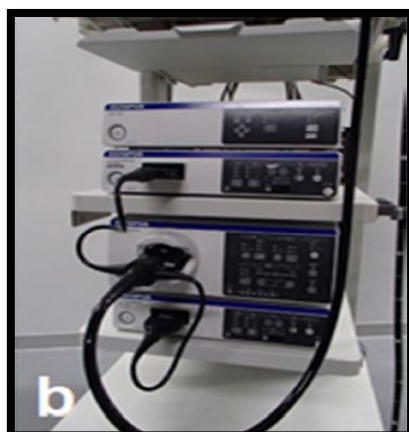
Introduction

Gastric cancer is that the fifth-most commonly diagnosed cancer worldwide and therefore the third-most common explanation for cancer-related death. Early detection of gastric cancer is vital to reducing the speed of cancer death. Detecting gastric cancer in an early stage and precisely delineating the cancer margin are necessary for a high cure rate by ESD. Novel technologies and devices have improved the standard of the endoscopic diagnosis. Optical image-enhanced technologies, such as narrow-band imaging (NBI), blue laser imaging and linked color imaging have facilitated the diagnosis of superficial gastric neoplasia. The technology of three-dimensional (3D) visualization is currently being used in many fields, including movies, video games and show attractions in amusement parks, and has also been introduced to some medical fields. The technique of 3D rigid endoscopy is clinically utilized in surgical fields and has enabled a more accurate and speedy procedure than a two-dimensional (2D) approach. Furthermore, this approach has been introduced in robotic surgery, enhancing the precision of minimally invasive surgery. In addition, 3D flexible endoscopy has also been developed. Recently, 3D flexible endoscopy was clinically applied in humans and reported to be feasible for ESD.

Aim: To evaluated the usefulness of 3D visualization for determining the margin of superficial gastric neoplasia compared to 2D visualization in clinical practice.

Methods: Twelve participants (4 novices, 4 trainees and 4 experts) evaluated two-dimensional (2D) and 3D endoscopic still images of 28 gastric neoplasias, obtained before ESD with white-light imaging (WLI) and narrow-band imaging (NBI). Assessments of the delineation accuracy of tumor extent and tumor morphology under 2D and 3D visualization were based on the histopathological diagnosis of ESD specimens. Participants answered visual analog scale (VAS) questionnaires (0–10, worst to best) concerning the (a) ease of recognition of lesion morphology, (b) lesion extent and (c) comprehensive endoscopic cognition under 2D and 3D visualization. The endpoints were the accuracy of tumor extent and morphology type and the degree of confidence in assessing (a)–(c).

A 3D flexible endoscopy system. A) Three-dimensional endoscope with two lenses and a forceps channel on its tip. B) The 3D flexible endoscopy system consists of a 3D flexible endoscope, two video system centers, a 3D Visualization Unit, a light source and a 3D monitor. C) The 3D image is visualized using the 3D monitor and 3D glasses



Results: The delineation accuracy of lesion extent [mean (95% confidence interval)] with WLI under 3D visualization [60.2% (56.1–64.3%)] was significantly higher than that under 2D visualization [52.3% (48.2–56.4%)] ($P < 0.001$).

The coincidence rate of lesion extent

	WLI				NBI		
	2D	3D	P value		2D	3D	P value
Overall	52.3% (48.2–56.4%)	60.2% (56.1–64.3%)	< 0.001		64.0% (60.7–67.4%)	70.3% (66.8–73.7%)	< 0.001
Novice	39.3% (31.9–46.7%)	50.8% (43.2–58.4%)	< 0.001		47.4% (41.5–53.4%)	49.1% (42.9–55.4%)	0.55
Trainee	53.8% (46.7–60.8%)	62.4% (55.6–69.2%)	0.001		68.0% (62.8–73.3%)	78.0% (73.1–82.9%)	< 0.001
Expert	63.9% (57.4–70.3%)	67.4% (60.8–74.0%)	0.055		76.8% (71.6–81.9%)	83.8% (79.4–88.2%)	< 0.001

The comparison of the ease of endoscopic lesion recognition

	WLI		P value	NBI		P value
	2D	3D		2D	3D	
Lesion morphology	4.78 (2.75)	7.03 (2.84)	<0.001	5.85 (2.28)	7.68 (2.34)	<0.001
LESION extent	4.18 (2.75)	6.05 (2.86)	<0.001	5.07 (2.49)	6.76 (2.53)	<0.001
Comprehensive endoscopic cognition	4.28 (2.81)	6.21 (2.98)	<0.001	5.35 (2.42)	7.18 (2.54)	<0.001

The accuracy with NBI under 3D visualization [70.3% (66.8–73.7%)] was also significantly higher than that under 2D visualization [64.2% (60.7–67.4%)] ($P < 0.001$). The accuracy of the morphology type with NBI under 3D visualization was significantly higher than that under 2D visualization ($P = 0.004$). The VAS for all aspects of endoscopic recognition under 3D visualization was significantly better than that under 2D visualization ($P < 0.01$).

Conclusions: Three-dimensional visualization can enhance the diagnostic quality for superficial gastric tumors.

Source: Higuchi et al. *Three-dimensional visualization improves the endoscopic diagnosis of superficial gastric neoplasia. BMC Gastroenterol* (2021) 21:242



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