

A teal-tinted image of the Golden Gate Bridge in San Francisco, showing the suspension towers and cables against a clear sky.

Yearly Updates in Motility and Functional Bowel Disorders

Nikhil Agarwal, MD

Palo Alto Medical Foundation

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ORIGINAL ARTICLE

Neurogastroenterology & Motility

NGM

WILEY

Chronic daily opioid exposure is associated with dysphagia, esophageal outflow obstruction, and disordered peristalsis

Arash Babaei^{1,2}  | Aniko Szabo³ | Sadaf Shad² | Benson T. Massey²

Background

- Opioids effect esophagus
- Not well studied
- 10% patients referred for manometry are on opioids

Babaei et al. Neurogastroenterol
Motil. July 2019; 31(7):e13601

Methods

- Retrospective study of patients who underwent HRM
- Classified into opioid naïve, occasional, and daily opioid use
- Used morphine milligram equivalent daily dose (MMED)
- Used manoview software using CCv3

Results

- 1890 naïve verse 224 chronic daily use
- Dysphagia most common reason for referral
- MMED 45 mg/day

Babaei et al. Neurogastroenterol
Motil. July 2019; 31(7):e13601

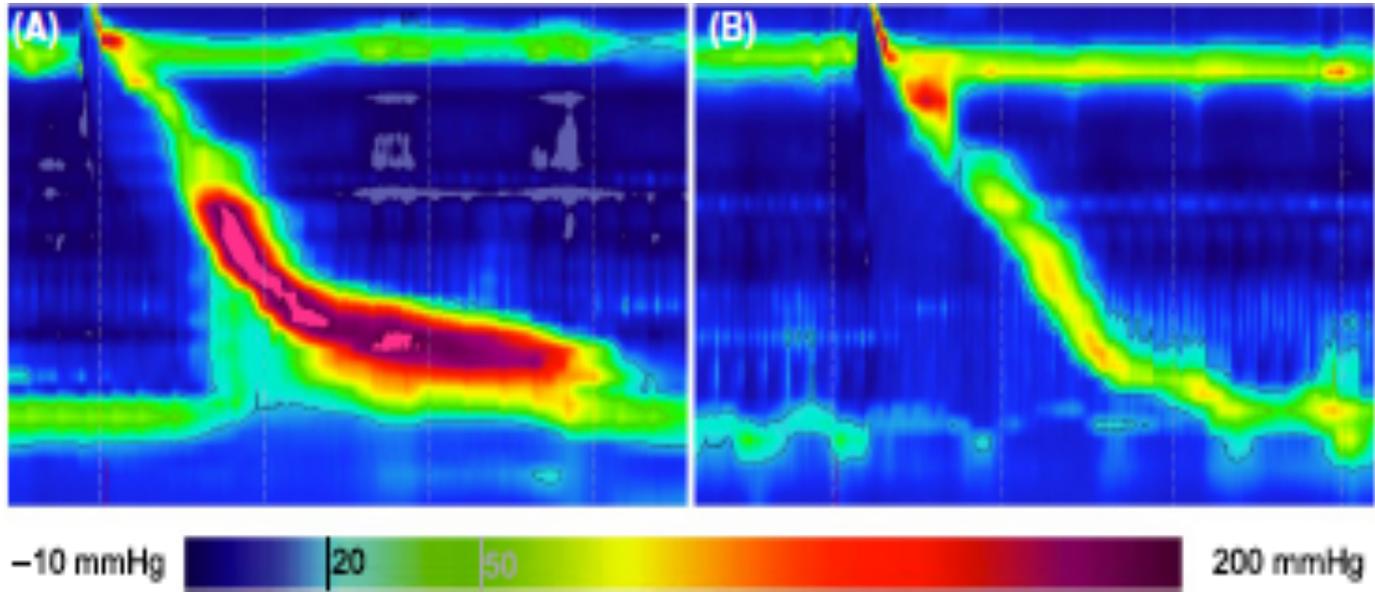
Results

Motility characteristics	Patients by opioid exposure		P value
	Naive (N=1590)	Chronic daily (N=200)	
Pressure metrics (mm Hg)			
Integrated relaxation	8 (5, 12)	11 (7, 17)	<0.0001
Intrabolus maximum	12 (9, 15)	14 (11, 19)	<0.0001
Basal expiratory LES	13 (7, 22)	17 (9, 31)	<0.0001
Motility diagnosis (%)			<0.0001
Absent contractility	47 (3%)	7 (3%)	0.7
Achalasia type 1	16 (1%)	2 (1%)	1
Achalasia type 2	77 (5%)	4 (2%)	0.1
Achalasia type 3	22 (1%)	25 (13%)	<0.0001
EGJ outflow obstruction	42 (3%)	26 (13%)	<0.0001
Esophageal spasm	8 (0.5%)	6 (3%)	<0.01
Hypercontractile esophagus	56 (4%)	6 (3%)	0.7
Ineffective motility	394 (25%)	33 (17%)	0.01
Normal peristalsis	928 (58%)	91 (45%)	<0.001

Summary

- 10% patients referred for manometry are on opioids
- Patients on chronic opioids are more likely to experience dysphagia
- Chronic opioid use associated with impaired deglutitive LES relaxation and abnormal peristalsis sequence
- Increase in ACH3 and EGJOO

Improvement of HRM off opioids



Cannabinoid Use in Patients With Gastroparesis and Related Disorders: Prevalence and Benefit

Asad Jehangir, MD¹ and Henry P. Parkman, MD¹

Background

- 15% of adults use marijuana regularly
- Marijuana has been shown to have some benefit with chronic pain, chemotherapy induced nausea and vomiting
- THC and CBD activate two endogenous cannabinoid receptors CB1 and CB2
- No studies on use of cannabinoids in GP

Jehangir et al. Am J Gastroenterol
2019; 114: 945-953

Methods

- Prospective study of adults seen at motility center for GP
- Asked to fill out questionnaires

Jehangir et al. Am J Gastroenterol
2019; 114: 945-953

Results

- 78% had delayed gastric emptying consistent with GP
- 22% with normal GET met criteria for FD or CNVS
- 47% used cannabinoids (68% MJ, 39% dronabinol, 14% CBD)
- 52% recommended cannabinoids by HCP
- Smoking most common form
- Nausea most common reason

Results

Table 2. Perceived benefit of cannabinoids and other alternative/complementary treatments in patients with Gp and related disorders

Factor	Better			Unchanged	Worse			No response
	Completely	Significantly	Somewhat		Somewhat	Considerably	Very considerably	
Cannabinoids								
Marijuana/THC (62 users) ^a	4 (6.5)	30 (48.4)	24 (38.7)	4 (6.5)	0 (0)	0 (0)	0 (0)	0 (0)
CBD (16 users)	0 (0)	4 (25)	9 (56.3)	3 (18.8)	0 (0)	0 (0)	0 (0)	0 (0)
Dronabinol (36 users)	0 (0)	7 (19.4)	10 (27.8)	11 (30.6)	1 (2.8)	0 (0)	0 (0)	7 (19.4)
Other alternative/complementary treatments								
Probiotics (81 users)	0 (0)	6 (7.4)	30 (37)	36 (44.4)	1 (1.2)	0 (0)	0 (0)	8 (9.9)
Ginger (56 users)	0 (0)	3 (5.4)	29 (51.8)	18 (32.1)	0 (0)	1 (1.8)	0 (0)	5 (8.9)
Acupuncture (30 users)	0 (0)	5 (16.7)	5 (16.7)	14 (46.7)	1 (3.3)	0 (0)	0 (0)	5 (16.7)
Herbal supplements (23 users)	0 (0)	2 (8.7)	7 (30.4)	9 (39.1)	1 (4.3)	0 (0)	0 (0)	4 (17.4)
Acupressure (8 users)	0 (0)	0 (0)	3 (37.5)	4 (50)	0 (0)	0 (0)	0 (0)	1 (12.5)
Massage (5 users)	0 (0)	0 (0)	2 (40)	2 (40)	0 (0)	0 (0)	0 (0)	1 (20)
Hypnosis (3 users)	0 (0)	0 (0)	0 (0)	2 (66.7)	0 (0)	0 (0)	0 (0)	1 (33.3)

Results

Table 3. Severity of symptoms on the PAGI-SYM Questionnaire in patients with Gp and related disorders, including patients actively on cannabinoids and patients with no history of cannabinoid use

Factor	All patients (N = 197)	Patients actively on cannabinoids (n = 70)	Patients with no history of cannabinoid use (n = 105)	P value
PAGI-SYM: individual symptoms				
Nausea	3.4 ± 1.5	3.8 ± 1.3	3.0 ± 1.6	<0.01
Retching	2.3 ± 1.7	2.6 ± 1.7	1.9 ± 1.7	0.01
Vomiting	2.1 ± 1.8	2.6 ± 1.8	1.7 ± 1.7	<0.01
Stomach fullness	3.7 ± 1.3	3.9 ± 1.3	3.5 ± 1.3	0.02
Early satiety	3.5 ± 1.5	3.8 ± 1.4	3.2 ± 1.6	0.01
Postprandial fullness	3.6 ± 1.5	3.7 ± 1.6	3.5 ± 1.5	0.16
Loss of appetite	3.2 ± 1.6	3.7 ± 1.4	2.7 ± 1.7	<0.01
Bloating	3.3 ± 1.6	3.4 ± 1.4	3.1 ± 1.7	0.22
Stomach or belly visibly larger	2.9 ± 1.7	3.1 ± 1.6	2.8 ± 1.7	0.30
Upper abdominal pain	3.0 ± 1.6	3.3 ± 1.7	2.6 ± 1.7	<0.01
Upper abdominal discomfort	3.1 ± 1.6	3.5 ± 1.5	2.7 ± 1.5	<0.01
Lower abdominal pain	2.4 ± 1.6	2.9 ± 1.6	2.1 ± 1.6	<0.01
Lower abdominal discomfort	2.5 ± 1.6	3.0 ± 1.5	2.1 ± 1.6	<0.01
Heartburn during the day	2.0 ± 1.7	2.2 ± 1.8	1.9 ± 1.6	0.33
Heartburn when lying down	2.1 ± 1.7	2.2 ± 1.7	2.0 ± 1.7	0.40
Feeling of discomfort inside chest during the day	1.7 ± 1.5	2.0 ± 1.6	1.4 ± 1.4	0.01
Feeling of discomfort inside chest at night	1.6 ± 1.6	1.9 ± 1.7	1.4 ± 1.5	0.04
Regurgitation or reflux during the day	2.1 ± 1.6	2.3 ± 1.7	1.9 ± 1.6	0.15
Regurgitation or reflux when lying down	2.1 ± 1.7	2.3 ± 1.7	1.8 ± 1.7	0.16
Bitter, acid, or sour taste in mouth	2.1 ± 1.7	2.3 ± 1.7	1.9 ± 1.6	0.12
Constipation	2.5 ± 1.8	2.3 ± 1.9	2.6 ± 1.7	0.28
Diarrhea	1.8 ± 1.8	2.0 ± 1.8	1.5 ± 1.7	0.07
PAGI-SYM subscales				
GCSI: total score	3.1 ± 1.2	3.4 ± 1.0	2.8 ± 1.3	<0.01
GCSI: nausea/vomiting subscale	2.6 ± 1.4	3.0 ± 1.3	2.2 ± 1.5	<0.01
GCSI: postprandial fullness/early satiety subscale	3.5 ± 1.3	3.8 ± 1.2	3.2 ± 1.3	<0.01
GCSI: bloating subscale	3.1 ± 1.6	3.2 ± 1.4	2.9 ± 1.7	0.24
Upper abdominal pain subscale	3.0 ± 1.8	3.4 ± 1.6	2.6 ± 1.6	<0.01
Lower abdominal pain subscale	2.5 ± 1.6	2.9 ± 1.5	2.1 ± 1.5	<0.01
Heartburn/regurgitation subscale	2.0 ± 1.4	2.2 ± 1.4	1.8 ± 1.3	0.08

Results are expressed as mean ± s.d. P value (calculated using Mann-Whitney U Test) compares patients actively using cannabinoids with patients with no history of cannabinoid use.

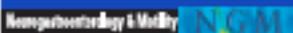
GCSI, Gastroparesis Cardinal Symptom Index; Gp, gastroparesis; PAGI-SYM, Patient Assessment of Gastrointestinal Symptoms.

Values in bold are statistically significant.

Conclusions

- Over a third of patients use cannabinoids (mostly MJ)
- Perceived benefit of nausea, pain
- Cannabinoid users were younger and had more severe GI symptoms

REVIEW ARTICLE

WILEY 

Systematic review and meta-analysis: Efficacy of patented probiotic, VSL#3, in irritable bowel syndrome

M. Connell¹ | A. Shin¹  | T. James-Stevenson¹ | H. Xu³ | T. F. Imperiale¹ | J. Herron²

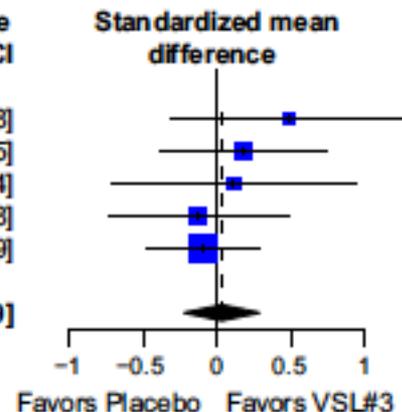
RCTs using VSL#3

TABLE 1 Characteristics of included randomized placebo-controlled trials

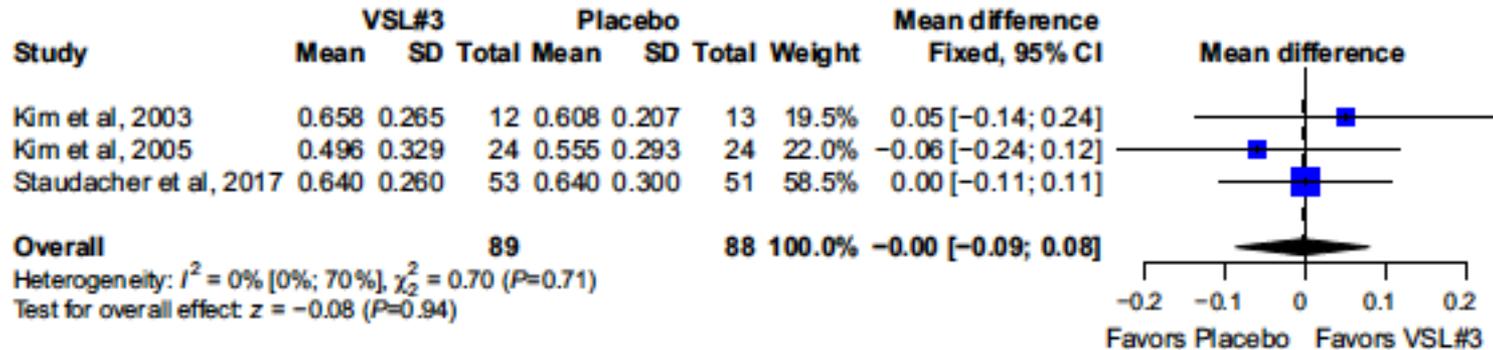
Study, Year	Study design	Location	Intervention (dose; N)	Control (N)	Treatment duration	Outcomes reported
Wong et al., 2015	RCT	Singapore, Singapore	VSL#3 (450×10^9 LB daily; 20)	PCBO (22)	6 weeks	AP, SC ^b , AB, QOL
Kim et al., 2005	RCT	Rochester, MN	VSL#3 (450×10^9 LB twice daily; 24)	PCBO (24)	8 weeks & 4 weeks ^d	AP, SC, OR, AB
Kim et al., 2003	RCT	Rochester, MN	VSL#3 (450×10^9 LB twice daily; 12)	PCBO (13)	8 weeks	AP, SC, OR, AB
Michail et al., 2011	RCT	Dayton, OH	VSL#3 (900×10^9 LB daily; 15)	PCBO (9)	8 weeks	AP, AB, QOL
Staudacher et al., 2016	RCT ^c	Multi-center ^a	VSL#3 (450×10^9 LB twice daily; 53)	PCBO (51)	4 weeks	AP, SC, OR, AB, QOL

Abdominal Pain

Study	VSL#3			Placebo			Weight	Std. Mean difference Fixed, 95% CI
	Mean	SD	Total	Mean	SD	Total		
Kim et al, 2003	8.00	18.9	12	0.00	14.1	13	10.1%	0.48 [-0.31; 1.28]
Kim et al, 2005	11.50	20.1	24	8.40	14.2	24	19.9%	0.18 [-0.39; 0.75]
Michail et al, 2011	-1.90	0.9	15	-2.00	0.9	9	9.4%	0.11 [-0.72; 0.94]
Wong et al, 2015	3.75	20.0	20	5.91	14.0	22	17.4%	-0.13 [-0.73; 0.48]
Staudacher et al, 2017	14.70	26.9	53	17.20	27.6	51	43.2%	-0.09 [-0.48; 0.29]
Overall			124			119	100.0%	0.03 [-0.22; 0.29]
Heterogeneity: $I^2 = 0\%$ [0%; 62%], $\chi^2_4 = 2.18$ ($P=0.70$)								
Test for overall effect: $z = 0.26$ ($P=0.80$)								



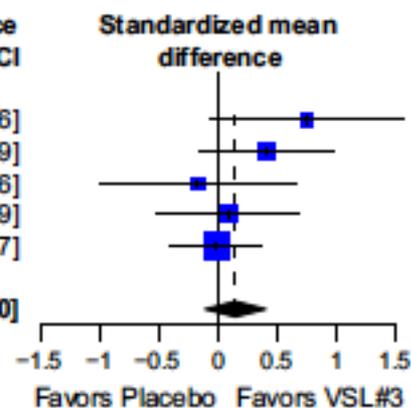
Stool Consistency



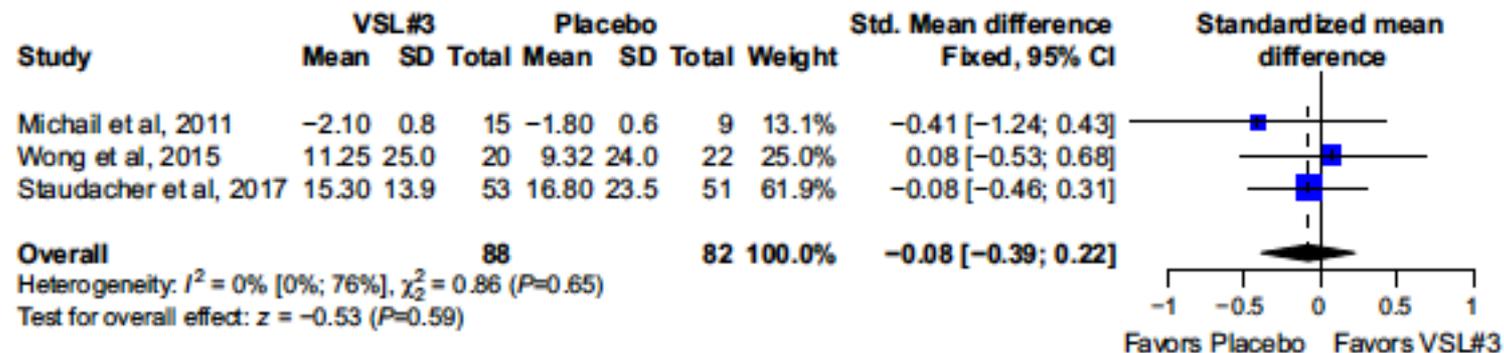
Bloating

Study	VSL#3			Placebo			Weight	Std. Mean difference Fixed, 95% CI
	Mean	SD	Total	Mean	SD	Total		
Kim et al, 2003	13.7	17.63	12	1.70	14.48	13	9.8%	0.75 [-0.06; 1.56]
Kim et al, 2005	15.0	23.10	24	6.20	19.20	24	19.7%	0.41 [-0.16; 0.99]
Michail et al, 2011	-1.6	0.30	15	-1.50	0.90	9	9.4%	-0.17 [-1.00; 0.66]
Wong et al, 2015	14.5	25.00	20	12.28	28.00	22	17.5%	0.08 [-0.52; 0.69]
Staudacher et al, 2017	13.5	24.80	53	13.80	25.20	51	43.6%	-0.01 [-0.40; 0.37]
Overall			124			119	100.0%	0.15 [-0.11; 0.40]

Heterogeneity: $I^2 = 5\%$ [0%; 80%], $\chi^2_4 = 4.20$ ($P=0.38$)
 Test for overall effect: $z = 1.14$ ($P=0.25$)

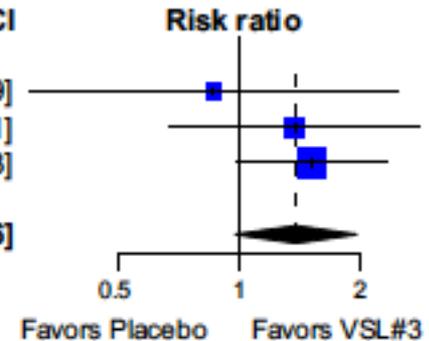


QOL



Overall Improvement

Study	VSL#3		Placebo		Weight	Risk ratio MH, Fixed, 95% CI
	Events	Total	Events	Total		
Kim et al, 2003	4	12	5	13	14.9%	0.87 [0.30; 2.49]
Kim et al, 2005	11	24	8	24	24.9%	1.38 [0.67; 2.81]
Staudacher et al, 2017	30	53	19	51	60.2%	1.52 [0.99; 2.33]
Overall		89		88	100.0%	1.39 [0.98; 1.96]
Heterogeneity: $I^2 = 0\%$ [0%; 78%], $\chi^2 = 0.94$ ($P=0.63$)						
Test for overall effect: $z = 1.85$ ($P=0.06$)						



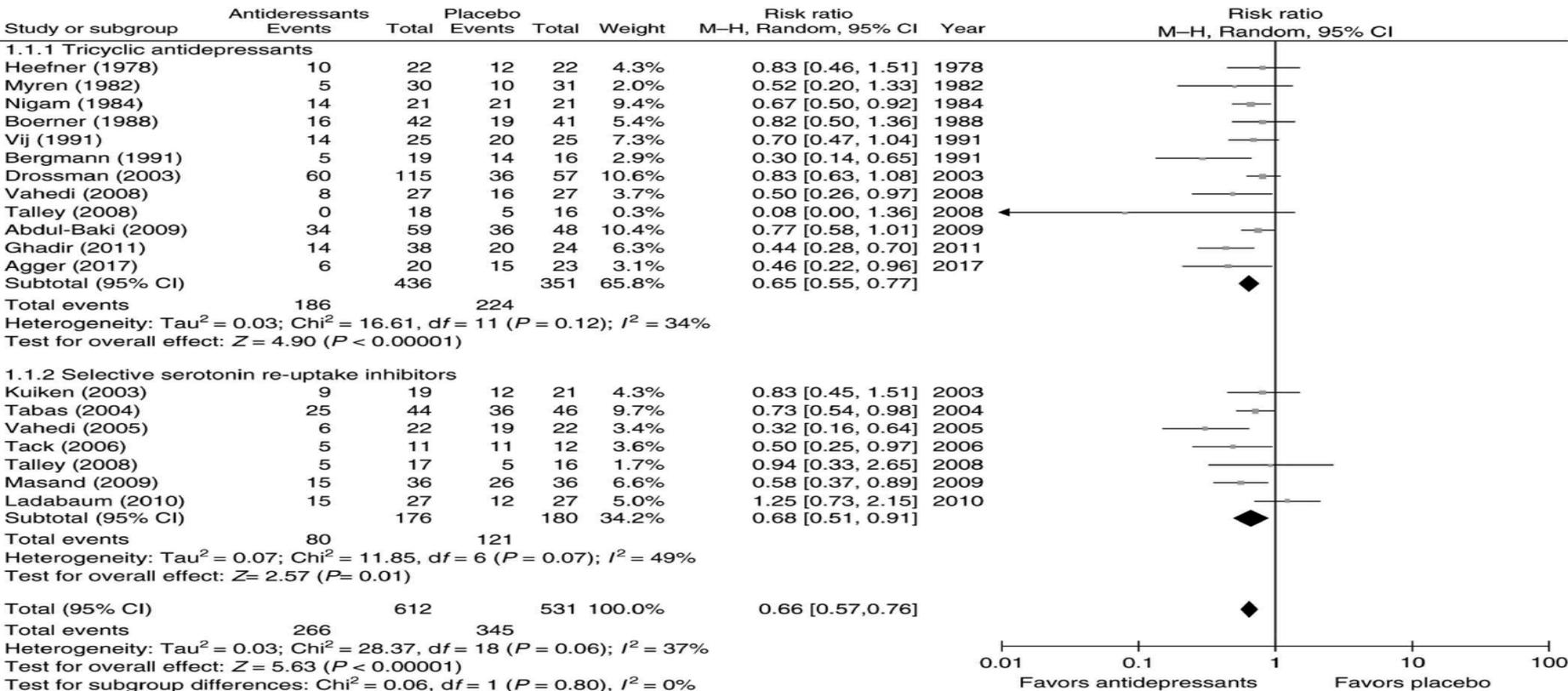
Conclusions

- No improvement in pain, stool consistency, bloating, QOL
- Trend towards improvement in overall response
- Low quality studies

Effect of Antidepressants and Psychological Therapies in Irritable Bowel Syndrome: An Updated Systematic Review and Meta-Analysis

Alexander C. Ford, MBChB, MD, FRCP^{1,2}, Brian E. Lacy, PhD, MD, FACG³, Lucinda A. Harris, MS, MD, FACG⁴, Eamonn M.M. Quigley, MD, FRCP, FACP, MACG, FRCPI⁵ and Paul Moayyedi, MBChB, PhD, FACG⁶

Results



Results

- NNT 4.5 TCAs and 5 SSRIs
- NNT 8.5 TCAs
- CBT, hypnotherapy, relaxation therapy, dynamic psychotherapy
more effective than controls



Prokinetics for Functional Dyspepsia: A Systematic Review and Meta-Analysis of Randomized Control Trials

Rapat Pittayanon, MD^{1,2}, Yuhong Yuan, MD¹, Natasha P Bollegala, MD³, Reena Khanna, MD⁴, Brian E. Lacy, MD, FACG⁵, Christopher N. Andrews, MD⁶, Grigorios I. Leontiadis, MD, PhD, FACG¹ and Paul Moayyedi, MB, ChB, PhD, FACG¹

Pittayanon et al. Am J Gastroenterol.
2019; 114; 233-243

Results

- Pooled data show NNT 7
- When cisapride removed, NNT 12
- No change in FD subtype (EPS versus PDS)
- No improvement in QOL
- Poor quality of data

ORIGINAL ARTICLE

WILEY  **NGM**

Beer effects on postprandial digestive symptoms and gastroesophageal physiology

B. Serrano Falcón¹  | M. Megía Sánchez¹ | A. Ruiz de León^{1,2} | E. Rey^{1,2}

Falcon et al. Neurogastroenterol
Motil 2018;30:e13325

Background and Methods

- Beer related to GERD and FD
- Alcoholic and alcohol free beer compared to mineral water
- Dyspepsia and GERD measured using nutrient drink test and 24 hour pH impedance testing

Results

- No change in symptoms with moderate traditional or non alcoholic beer intake
- No change in GI physiology on basis of gastric accommodation or GER

ORIGINAL ARTICLE

WILEY 

Linaclotide increases cecal pH, accelerates colonic transit, and increases colonic motility in irritable bowel syndrome with constipation

Adam D. Farmer^{1,2,3,4}  | James K. Ruffle²  | Anthony R. Hobson⁴

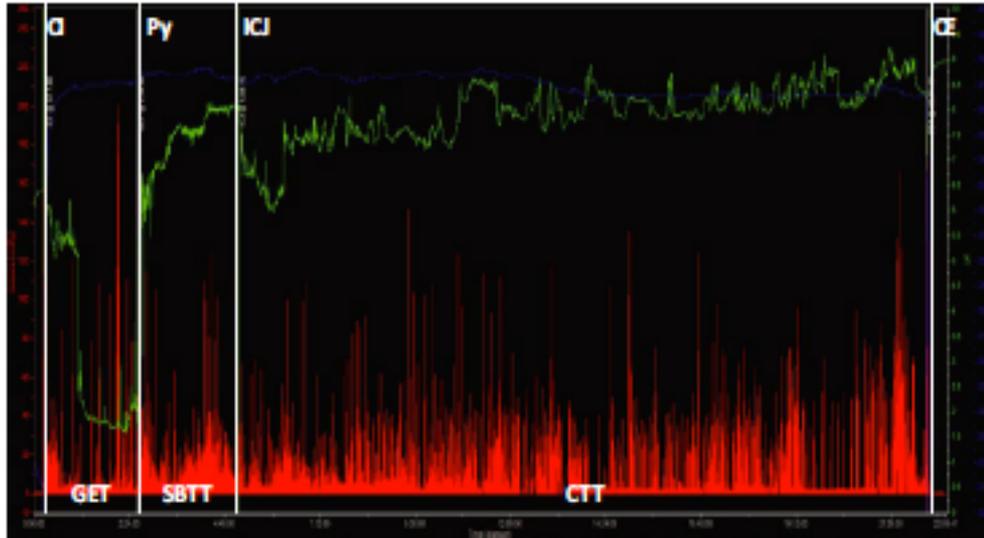
Farmer et al. Neurogastroenterol Motil
2019;31:e13492

Background

- Linaclotide approved for IBS-c and CIC
- Linaclotide agonist of GC-C
- Increased intraluminal cGMP concentration
- CFTR ion channel secretes chloride and bicarbonate
- cGMP intracellularly may modulate visceral hyperalgesia

Methods

- 16 patients with IBS-c on linaclootide 290 mcg
- WMC at baseline and after 28 days on linaclootide



Results

- Linaclotide had reduced cecal fermentation
- Reduced change in pH across ICJ
- Improved CTT
- Reductions in cecal fermentation associated with improvements in symptoms.

Results

Measure	Pre linaclotide (mean \pm SD or median and IQR)	Post linaclotide (mean \pm SD or median and IQR)	P-Value
Gastric emptying time (minutes)	142 (118-173)	161 (139-189)	0.12 (NSD)
Gastric log motility index	13.2 \pm 1.9	13.3 \pm 2.2	0.64 (NSD)
Small bowel transit time (minutes)	287 (240-497)	265 (205-404)	0.33 (NSD)
Small bowel log motility index	13.8 \pm 1.8	14.4 \pm 4	0.16 (NSD)
Colonic transit time (minutes)	2650 (2171-4038)	1757 (1112-3011)	0.02
Colonic log motility index	15 \pm 1.8	16.5 \pm 1.8	0.004

Clinical Gastroenterology and Hepatology 2019;17:82–89

Gastric Peroral Endoscopic Pyloromyotomy Reduces Symptoms, Increases Quality of Life, and Reduces Health Care Use For Patients With Gastroparesis



Parit Mekaroonkamol,^{*,a} Sunil Dacha,^{*,a} Lei Wang,[‡] Xiaoyu Li,[§] Yueping Jiang,[§] Lianyong Li,^{||} Tian Li,^{||} Nikrad Shahnava,^{*} Sonali Sakaria,^{*} Francis E. LeVert,^{*} Steven Keilin,^{*} Field Willingham,^{*} Jennifer Christie,^{*} and Qiang Cai^{*}

Results

- Retrospective analysis of 30 patients with refractory GP underwent G POEM
- 80% had improvement of GCSI scores
- Improvement in QOL
- Less hospitalizations and ED visits (18 mo follow up)

Results

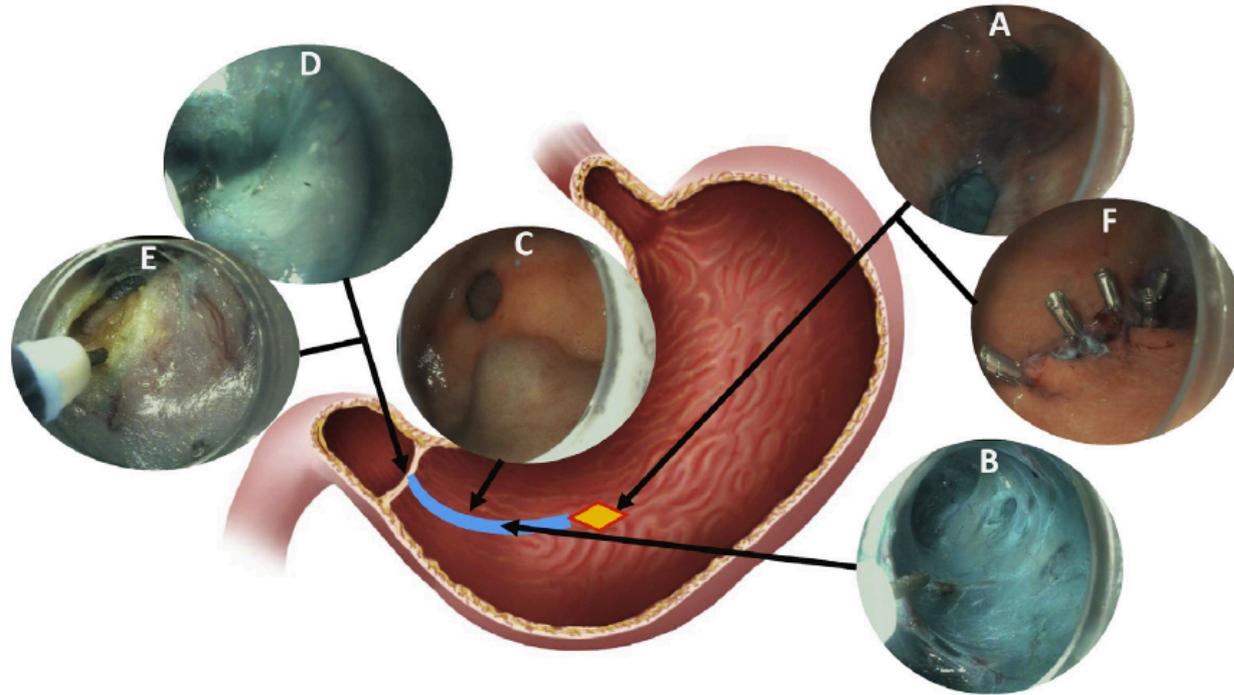


Figure 1. GPOEM procedure. (A) Mucosotomy, 3 to 4 cm in length, performed 5 to 7 cm proximal to the pylorus to allow submucosal entry. (B) Submucosal tunnel. (C) Periodic assessment of the submucosal tunnel from the intraluminal side to ensure accurate direction of the tunnel. (D) Identification of pyloric ring. (E) Selective circular myotomy. (F) Defect closure using endoscopic clips.

Results

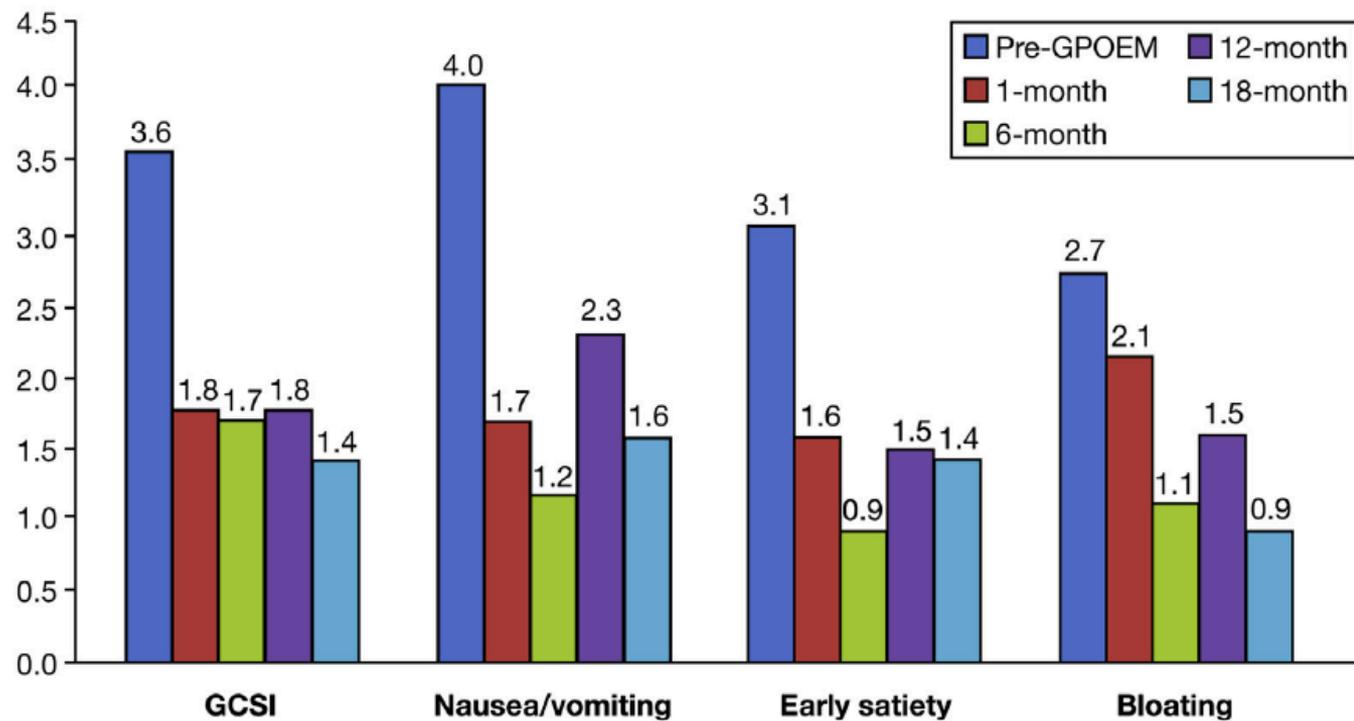


Figure 2. Improvement of GCSI after GPOEM.

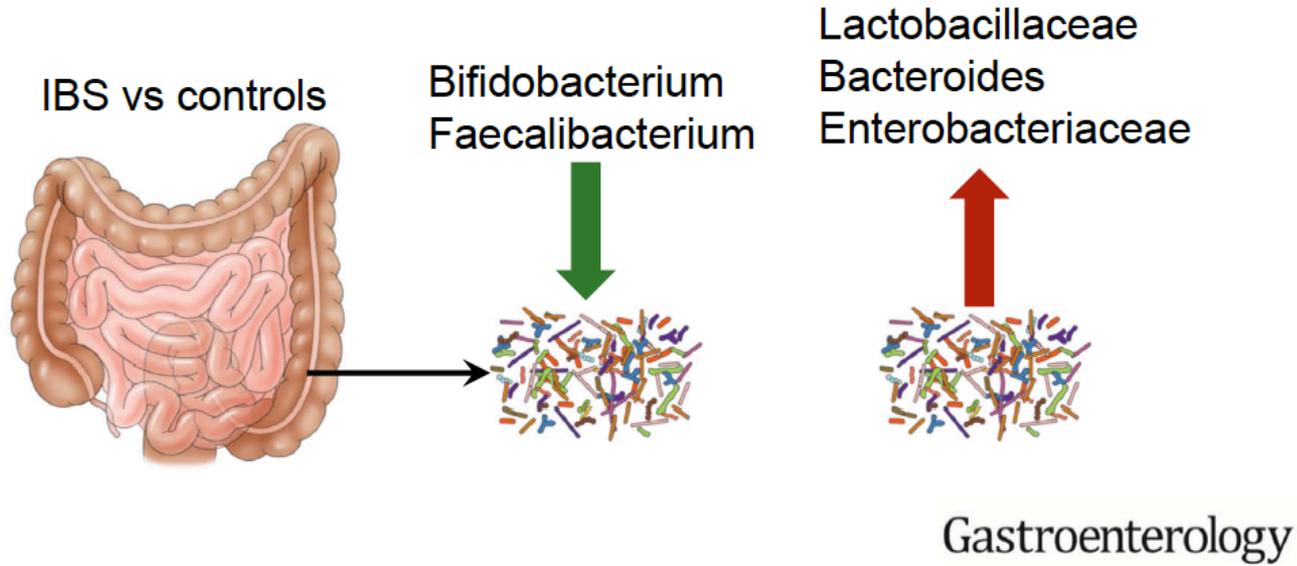
Gut Microbiota in Patients With Irritable Bowel Syndrome—A Systematic Review



Rapat Pittayanon,^{1,2} Jennifer T. Lau,¹ Yuhong Yuan,¹ Grigorios I. Leontiadis,¹ Frances Tse,¹ Michael Surette,¹ and Paul Moayyedi¹

¹Department of Medicine, Division of Gastroenterology and Farncombe Family Digestive Health Research Institute, McMaster University, Hamilton, Ontario, Canada; and ²Division of Gastroenterology, Department of Medicine, Faculty of Medicine, Chulalongkorn University and King Chulalongkorn Memorial Hospital, The Thai Red Cross, Bangkok, Thailand

Results



REVIEW ARTICLE

WILEY 

Efficacy and safety of pneumatic dilation in achalasia: A systematic review and meta-analysis

Froukje B. van Hoeij  | Leah I. Prins | André J. P. M. Smout | Arjan J. Bredenoord

Van Hoeij et al. Neurogastroenterol
Motil. 2019;13:e13458

Results

- 10 Studies with 643 patients
- 81% and 79% success rate with 30 and 35 mm dilation
- 90% success rate with 40 mm dilation
- Perforation most common with initial dilation (3.2%)
- Graded dilation was safer

ORIGINAL ARTICLE

WILEY  **NGM**

Metformin prevents colonic barrier dysfunction by inhibiting mast cell activation in maternal separation-induced IBS-like rats

Yong Li^{1,2} | Tingting Yang¹ | Qing Yao² | Songsong Li³ | En Fang³ | Yankun Li⁴ |
Chao Liu² | Weimin Li¹ 

Li et al. Neurogastroenterol Motil.
2019;31:e13556

Results

- Reduced visceral hypersensitivity to colorectal distension
- Inhibition of tight cell junction dilation
- Inhibition of mast cell activation with down regulation of IL-6, IL-18, tryptase
- May be a potential therapeutic option

ORIGINAL ARTICLE

WILEY  NGM

Long-term outcome of anorectal biofeedback for treatment of fecal incontinence

Y. Mazor^{1,2}  | A. Ejova³ | A. Andrews¹ | M. Jones³ | J. Kellow^{1,2} | A. Malcolm^{1,2}

Mazor et al. Neurogastroenterol
Motil. 2018; 30:e13389

Results

- 54% patients had long term improvement at 7 years
- at least 50% reduction in FI episodes
- QOL was not maintained at 7 years
- Improvement was typically seen early

Botulinum toxin for the treatment of hypercontractile esophagus: Results of a double-blind randomized sham-controlled study

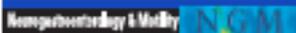
François Mion^{1,2,3}  | Sophie Marjoux¹ | Fabien Subtil⁴ | Mathieu Pioche⁵ |
Jerome Rivory⁵ | Sabine Roman^{1,2,3}  | Frank Zerbib⁶

Mion et al. Neurogastroenterol Motil.
2019;31:e13587

Results

- 13 with hypercontractile esophageal motility disorder received botox compared to 10 with sham procedure
- No improvement with botox injections at 3 months
- 17 patients received additional botox injections.
- Trend towards improvement at 12 months, but independent of botox administration

ORIGINAL ARTICLE

WILEY  **NGM**

Does a glucose-based hydrogen and methane breath test detect bacterial overgrowth in the jejunum?

O. H. Sundin¹  | A. Mendoza-Ladd² | E. Morales¹ | B. M. Fagan¹ | M. Zeng¹ |
D. Diaz-Arévalo¹ | J. Ordoñez³ | R. W. McCallum² 

Sundin et al. Neurogastroenterol
Motil. 2018; 30:e13350

Results

- Glucose breath test compared to jejunal aspirates PCR
- Hydrogen- methane levels not correlated with higher colony counts
- Hydrogen- methane levels correlated with lower viability of jejunal bacteria

REVIEW ARTICLE

WILEY 

Exercise therapy of patients with irritable bowel syndrome: A systematic review of randomized controlled trials

Changli Zhou¹  | Enfa Zhao²  | Yuewei Li¹  | Yong Jia¹  | Feng Li¹ 

Zhou et al. Neurogastroenterol
Motil. 2019;31:e13461

Results

- 683 patients across 14 studies
- yoga, walking, aerobic exercise, Tai ji
- Benefits of exercise noted, but data poor