

ACUPUNCTURE TREATMENT FOR FUNCTIONAL DYSPEPSIA

Literature research paper by S. Brandon

Abstract

Functional dyspepsia is a common disorder with a prevalence of up to 40% in Western countries. Etiology and pathogenesis are diverse. Treatment options therefore also differ and include various pharmacological therapies, with possible side effects.

Though common in the East acupuncture is not included in the therapeutic scheme in the West.

How can acupuncture contribute to the treatment of this functional disease and by which mechanisms does acupuncture intervene?

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In general practice stomach pain and discomfort are common complaints. As such treating stomach pain is the core business of general practitioners. Many general practitioners struggle to relieve or treat patients with chronic conditions without identifiable source especially when pharmacological therapy fails or causes significant side effects. Functional dyspepsia (FD) is one of those conditions that frustrate general practitioners for its recurrent and debilitating symptoms. With functional dyspepsia treatment is difficult and often not successful. We are pressed by patients to do numerous test and investigations and often have to reach the dissatisfying conclusion that we have no specific physical explanation for the symptoms. We are left with treatment by trial and error and are often giving random dietary advice. Pharmacological therapy aimed at relieving symptoms has multiple side effect and is often administered as chronic medication. A psychological approach in which we explain the relationship between stress and symptoms is often not appreciated by patients with functional dyspepsia. Though common practice in the East, in western medicine acupuncture is not known as a treatment method for this disease. The main research question is whether acupuncture provides relieve of symptoms in FD patients.

Case

A 46-year-old female patient, of Mediterranean descent with chronic stomach pain and complaints of fullness, bloating, anorexia, and difficulty producing stool, constipation. She has been treated for *Helicobacter pylori* infection with eradication therapy to no avail. The gastroenterologist was consulted. He advises (since the gastroscopy was normal 1,5 years ago) that re-eradication of *H. pylori* might not be successful. Thus, re-examination whether *H. pylori* is involved, is not advised or useful.

The patient is diagnosed with IBS-C diagnosis with predominantly stomach pain. Her constipation was successfully treated with stool softeners in a time span of several months. Functional dyspepsia is the final diagnosis as her stomach pain did not resolve.

Questions remain for unsuccessfully treated stomach pain and gastric dysfunction. **1. Does acupuncture, electroacupuncture or moxibustion relieve symptoms of functional dyspepsia?**

P: patient with FD

I: treatment with acupuncture, electroacupuncture, moxibustion

C: sham acupuncture, pharmacologic therapy or standard care

O: VAS pain score, Quality of Life, gastrointestinal symptoms

In searching through the literature, I was also interested to discover what mechanisms explain the influence of treating a FD patient with acupuncture, the how and why.

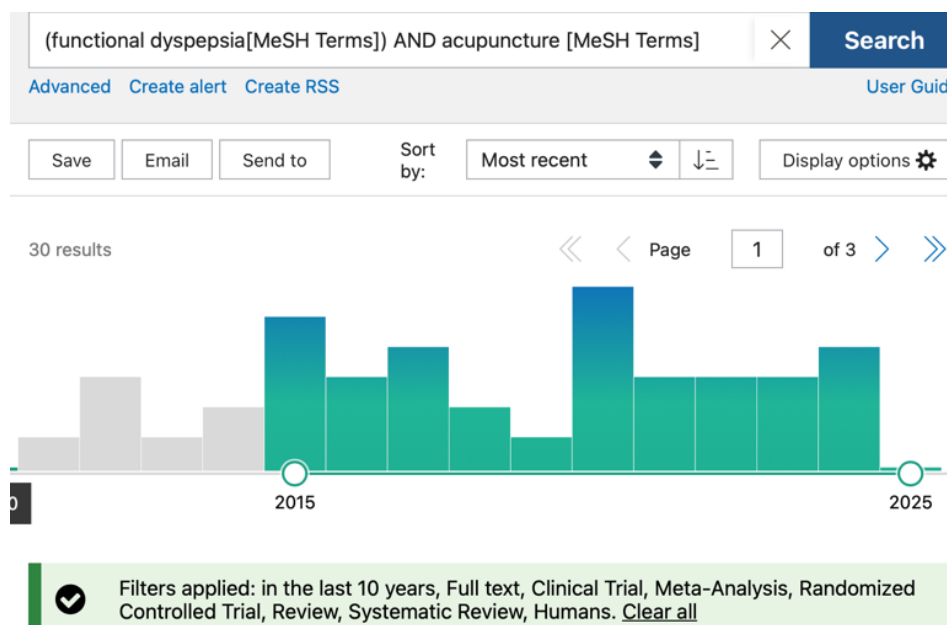
The secondary research question became: **2. What mechanisms describe and explain therapeutic influence of acupuncture, electro acupuncture and moxibustion in FD patients?**

Literature search

The Cochrane library search yields one result from 2014 ¹⁰.

In this study authors conclude that it remains unknown whether manual acupuncture or electroacupuncture is more effective or safer than other treatments for patients with FD.

The low quality of evidence obtained has not permitted a robust conclusion concerning the efficacy and safety of acupuncture in the treatment of FD.



The Pubmed Database search with Mesh 'Functional dyspepsia' and Mesh 'Acupuncture' yielded a total of 111 studies in result. Since the Cochrane result was published in 2014. I limited the results to 10 years 2015-2025. After selection of only human trails and full text availability, 30 studies were found. Three additional relevant studies were found through literature list of one of the studies above.

These abstracts were all read and categorized. Several studies were protocols for studies yet to be executed (5). One study was only about Sham acupuncture. There were several studies with a single randomized control trial (blinded) RCT definition. One study only in Chinese language and one only available in Spanish.

In conclusion: the most relevant studies with full text availability were nine systematic reviews and meta-analysis. ¹⁻⁹

Background: definition, classification

Functional dyspepsia is a common digestive disorder characterized by chronic or recurrent pain and discomfort in the upper abdomen, without any identifiable structural or biochemical cause after standard testing (like endoscopy). It's considered a functional gastrointestinal disorder, meaning the symptoms are real but not linked to visible damage or known disease.

Functional gastrointestinal disorders (FGIDs) are defined as disorders caused by a combination of genetics, psychological factors, social factors, disturbance in the gut-brain axis, and environmental stressors. Irritable bowel syndrome (IBS), functional dyspepsia (FD), and functional constipation (FC) are the most common FGIDs.

FD is divided into two functional dyspepsia subtypes, epigastric pain syndrome (EPS) and postprandial distress syndrome (PDS) based on the predominant symptom pattern. Although this distinction is not specific for either symptom set or for the presumed etiology there might be relevance in a therapeutic approach.

The Rome criteria ²² are used to diagnose and classify FD.

Rome IV Criteria for Functional Dyspepsia

In adults, functional dyspepsia with no evidence of structural disease is diagnosed with at least one of the following symptoms present for three or more months, with onset at least six months before diagnosis and affecting quality of life:

- Postprandial fullness
- Epigastric pain
- Epigastric burning
- Early satiety

Prevalence

Table 1: Functional Dyspepsia (FD) – Prevalence ²²

Category	Estimated Prevalence
Global general population	5–11%
Western countries	10–40%
Asia	5–30%
Gender	More common in women
Age group	All ages peak 20-50 years

Treatment

Treating FD focuses on relieving symptoms, since there's no structural cause to fix. It often requires a combination of lifestyle changes, medications, and sometimes psychological support.

Table 2: Stepwise Approach to Treating Functional Dyspepsia

Treatment Type	Details / Examples and effectiveness
Dietary and Lifestyle Changes	Eat smaller, more frequent meals Avoid trigger foods (fatty, spicy, caffeine, alcohol) Avoid lying down after eating Manage stress Helpful in many cases and low risk
Acid Suppression Therapy	Antacids Proton Pump Inhibitors (PPIs) (e.g., omeprazole) H2 blockers (e.g., ranitidine) Often first-line; especially if epigastric pain is present
Prokinetic Agents	Domperidone, metoclopramide, prucalopride Effective in postprandial distress syndrome (PDS)
Antidepressants (Low-dose)	Tricyclic antidepressants (TCAs) like amitriptyline SSRIs/SNRIs (less evidence) Useful for pain-predominant FD and brain-gut dysfunction
Antibiotics (in selected cases)	Rifaximin (non-absorbed antibiotic) Trial if small intestinal bacterial overgrowth (SIBO) suspected Modest benefit in some patients
Herbal / Natural Agents	Iberogast, peppermint oil, ginger Some evidence; generally, well tolerated
Psychological Therapies	Cognitive Behavioral Therapy (CBT) Gut-directed hypnotherapy Mindfulness Particularly helpful if anxiety/stress is a trigger
H. pylori Eradication	If H. pylori positive, antibiotics + PPI Can lead to complete symptom resolution in some patients
Tailoring Treatment Based on FD Subtype	
FD Subtype	Best Treatment Options
Postprandial Distress Syndrome (PDS)	Prokinetics, dietary modification, small meals
Epigastric Pain Syndrome (EPS)	Acid suppression (PPIs), low-dose TCAs



Pharmacologic treatment of FD

The efficacy of pharmacological treatments, such as prokinetic agents, proton pump inhibitors, anticholinergic spasmolytics, dopamine antagonists, tricyclics, anti-diarrhea medication, 5-HT₃ antagonists, and antidepressants (SSRI and NSSRI), remains unsatisfactory because of the associated adverse effects.

Proton pump inhibitors main side effects include sleep disorders, headache and adverse gastrointestinal effects such as diarrhea, constipation and nausea. Dopamine antagonists like metoclopramide (Primperan) and Domperidone can cause sleepiness. Anticholinergic therapy, like scopolaminebutyl (Buscopan), have tachycardia and dry mouth as important side effects. The selective 5-HT₃ antagonists (Granisetron and Ondansetron) and 5-HT₄ agonists (Cisapride and Tegaserod), pose, though rare, a potential risk of ischemic colitis and cardiovascular events (prolonged QT length), respectively and more commonly cause headache and constipation.

Antidepressant medication tricyclic and SSRI's may invoke a whole range of gastrointestinal disturbances, influence the psyche, cause sleepiness and are often difficult to wean off.

In addition, single agents of pharmacotherapy target only one symptom at a time and thus are unlikely to be effective in patients with multiple symptoms in the upper and lower digestive tracts. The combined use of drugs to treat upper and lower abdominal symptoms raises the possibility of even more side effects. In case of decreased kidney or liver function starting and continuing medication is even more challenging. In summary, difficulties concerning administering pharmacologic therapy and the related adverse effects make the need for other treatment options very clear.

Mechanisms

Factors with etiologic and pathologic relationships to functional dyspepsia include micro-inflammation, GI infections, abnormalities of gastroduodenal motility, visceral hypersensitivity, disturbances along the brain-gut axis, and psychological factors; all of these causative mechanisms have the potential to partially explain symptoms in some functional dyspepsia patients, thus providing a rationale for the efficacy of a diversity of therapeutic approaches to functional dyspepsia.^{23,24}

Table 3: Mechanisms of how acupuncture might work

Mechanism	Potential Benefit
Modulation of the autonomic nervous system	Improves gastric motility and gastric accommodation reduces visceral hypersensitivity
Endorphin release	Pain and stress relief
Regulation of gastric acid secretion	May help in epigastric pain syndrome Influence mucosal alteration and secretion
Activation of brain-gut pathways	Reduces symptom perception and improves quality of life
Control intestinal inflammation	May reduce gastric pain and function

Mechanistic insights of acupuncture

Gastric dysmotility, impaired gastric accommodation, visceral hypersensitivity, and mucosal alteration have been highly recognized as the basic pathophysiological factors of FD. Research suggests that acupuncture may modulate the autonomic nervous system and thus enhance gastric mobility (GET), improve postprandial fullness, early satiety and epigastric pain. Acupuncture may also control intestinal inflammation, suppress acid secretion and reduce symptoms like nausea and bloating. Neuroimaging has shown that acupuncture regulates the brain-gut axis signaling and reduces anxiety and depression related symptoms contributing to symptom relief in FD. Research showed that there was a significant increase in glucose metabolism in the thalamus, insula, cingulate gyrus, prefrontal cortex, cerebellum and other cerebral regions of FD patients, which was significantly correlated with the severity of the disease. Several studies have shown the influence of acupuncture in the brain glucose metabolism in certain areas of the brain. Heart rate variability, a sign of modulation of the autonomic nervous system is definitely influenced by acupuncture.^{8,11}

Several studies have shown systemic immune activation in FD. For instance, in one study, the levels of tumor necrosis factor- α , interleukin-1 β , and interleukin-10 as well as small bowel homing T cells were found to be elevated in FD patients compared with healthy controls or patients with irritable bowel syndrome. Gastro intestinal (GI) hormones: Five GI hormones were tested, including neuropeptide Y (NPY), motilin, ghrelin, calcitonin gene-related peptide (CGRP) and glucagon-like peptide-1 (GLP-1).¹¹

Electroacupuncture was reported to increase motilin, ghrelin, and GLP-1 levels and decrease CGRP level.

Evidence of acupuncture influencing gastric hormonal levels and the immune activation provides another explanation as to how acupuncture therapy works in FD patients. There is evidence that electroacupuncture may be even more effective than traditional manual acupuncture.⁷

Acupuncture has shown very little adverse effects in all studies especially when compared to pharmacological treatment.

Conclusion

My FD patient with severe symptoms and depleted regular therapeutic measures would most likely benefit from acupuncture therapy. According to Cohen ethical thinking, treatment with acupuncture in this case would be ethical, seeing as we have evidence of effective treatment and it is a safe treatment, harm is not very likely.

In the East, acupuncture has been practiced for thousands of years and is considered an active treatment for FGIDs for a long time.

My research findings are depicted in table 4. The nine review studies show an overall effective result from acupuncture compared with no treatment, standard treatment or even add on treatment of acupuncture combined with standard treatment. Most of these studies have been done in China or Korea, except for the Wang et al. review. It might be frowned upon to simply extrapolate the findings to other ethnic populations. The overwhelming amount of evidence that has shown efficacy of acupuncture in the treatment of FD is on the other hand undeniable. Especially since the evidence includes research that explains the underlying mechanism of the effect of acupuncture and this supports the physiological explanation of acupuncture treatment. ^{7,8,11,20}

Based on current available evidence, acupuncture therapy achieves statistically significant effect for FD in comparison with sham acupuncture and is superior to medication (prokinetic agents) in improving the symptoms and quality of life of FD patients, with less side effects. ⁹

The latest meta-analysis (2024 Bayesian ¹) indicated that combining acupuncture with Western medicine was more effective in alleviating early satiation and postprandial fullness symptoms than Western medicine alone. Guo et al. found that electroacupuncture (EA) significantly improved clinical symptoms compared to sham EA. EA was found to be as effective as pharmacologic medication, with fewer adverse reactions. ⁷ The symptoms that frequently improved with acupuncture combined with conventional western medicine (CWM) therapy were epigastric pain, epigastric burning, postprandial fullness, and early satiation. And recurrence of symptoms was reduced after acupuncture therapy compared to regular treatment (CWM) alone. ⁴ The nine reviews conclude that more research is needed because studies are of low or moderate quality. The most apparent criticism being that blinding was not or poorly performed. As is often the pertaining critique of acupuncture research.

Sham acupuncture and Sham EA are also researched. Kim et al. ²⁰ found that acupuncture significantly improved FD symptoms compared to sham acupuncture and gastrointestinal regulators (PM). Pang et al. ⁹ found that acupuncture significantly improved Nepean Dyspepsia Index (NDI) scores and quality of life measures compared to sham acupuncture and prokinetic agents. A randomized control trial Jin et al. ²¹ compared acupuncture at classic acupoints with manipulation to acupuncture at non-acupoints without manipulation in 60 FD patients. The treatment group showed significant improvements in dyspeptic symptoms, mental status, and quality of life. These effects persisted during a three-month follow-up.

Since I have been researching this topic (months), I came across many patients with FGIDs who might benefit from acupuncture. Our general aim is to treat patients and not harm them. By not granting patients the possibility of being treated with acupuncture we may subject them to a prolonged period of pain and suffering, if not, excessive and possibly invasive testing. It is high time that we add acupuncture to the possible treatment options for this patient group, even before regular pharmacological care is introduced. Table 2.

I would propose the following decision tree: figure 1



Stepwise Approach to Treating Functional Dyspepsia (FD)

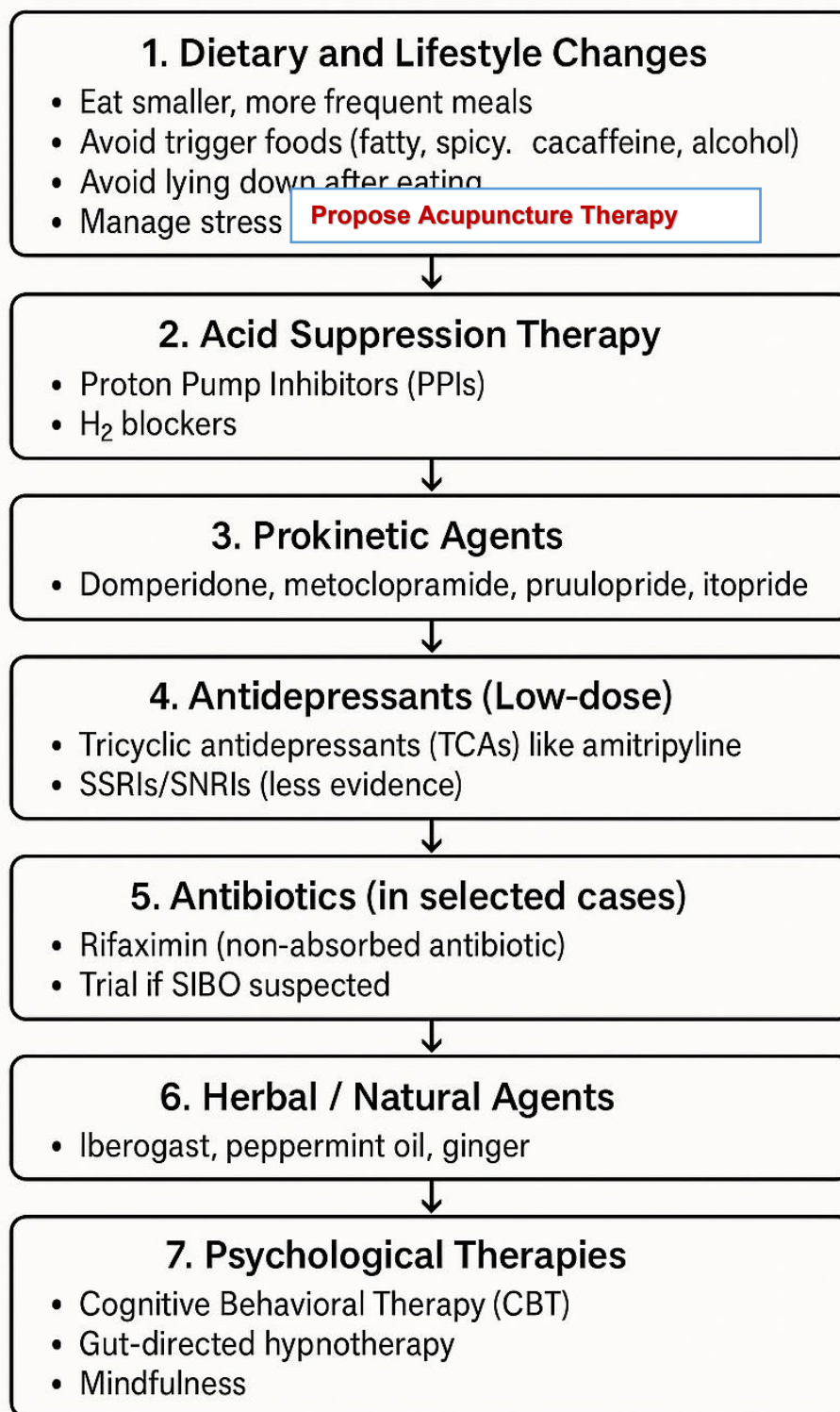
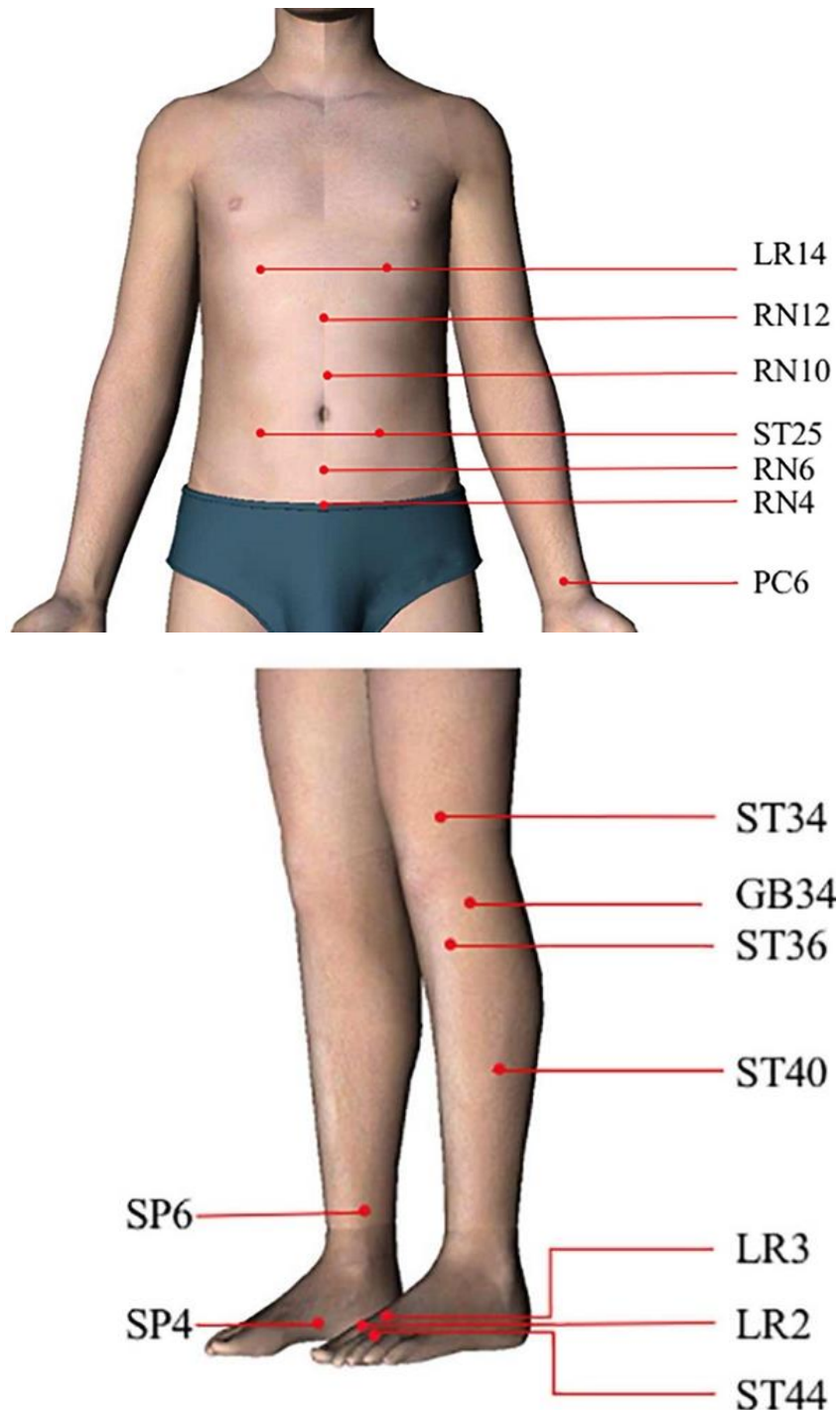


Figure 1 Stepwise treatment of FD with acupuncture

According to TCM FD can be divided into spleen deficiency and qi stagnation syndrome, liver stomach disharmony syndrome, spleen stomach damp heat syndrome, spleen stomach deficiency cold (weak) syndrome, and mixed cold and heat syndrome.

Most commonly used acupuncture points in FD



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Table 4 Review Studies FD and acupuncture

Study	Author year	Meta analysis	Amount of Studies	Years of studies included	diagn	Number of patients	interv	control	outcome	result	conclusion	comment
1.	Liao 2024	meta	34	2006-2022 China	FD	2950	MA, Mox, EA etc.	CWM or sham of placebo	Symptom reduction	MA + CWM is better than CWM alone Early satiation, PP fullness	ADD on is more effective	
2.	Xu 2024	meta	16	2011-2022 China	FD	1315	MA	Sham Combi	Anxiety depression SAS, SDS, HAMA, HAM-D, HAM-S	Effective Comparable or better with first line neuromodulator drugs	Less side effects	
3.	Xiao 2023	meta	12	2014-2021 China	PDS	1113	MA, EA	Gasnotin, Sham, movoxyline	SID HADS NDI GET	Effective better QoL	acupuncture is effective in the treatment of PDS Alleviates symptoms and improves QoL	men
4.	Kwon 2021	meta	22	2008-2020 China	FD	1960	MA EA AT	MA+PM PM	NDI Total Effective Rate	Combi CWM with MA better than CWM alone Alleviates epigastric pain, epigastric burning, postprandial fullness, and early satiation.	Effective ADD on Less recurrence	
5.	Wang 2021	meta	21 24 16 Total 61	China, USA UK Canada	FD IBS FC	2875 3220 3352 Total 9447	MA EA MOX	PM Placebo Sham combine	Symptom Reduction Adverse effects	MA vs Sham RR 1.69 MA vs No RR 1.86 MA vs PM RR 1.13 MA vs CWM RR 1.25	Effective Except Combi in IBS group	33-75 yrs 2-12 wks
6.	Mao Guo 2020	meta	7	2008-2018 China	FD	853	EA	Sham PM mosapride domperidon	Symptom score EGG GET Motilin level	EA better than Sham Equal to PM less side effect	EA is effective	
7.	GUO 2020	meta	8	2012-2018	FD	642	MA EA TEA	Sham Combi PM	Symptom score EGG GET Barogram Hormones HRV PET scan cerebral activity	Positive effect on regulating gastric motility, gastric accommodation, mental status, gastrointestinal hormones, and central and autonomic functions improving dyspeptic symptoms and quality of life.	EA is effective	Mechanism study
8.	HO 2017	review	22	2001-2015 China	FD	1727	MA EA	PM	Symptom reduction	MA>Domperidone MA> itopride Mox=domperidone EA> itopride	Combi with MA/EA better than PM alone	1.2-20 months 17-70 yrs
9.	Pang 2016	meta	16	2006-2015	FD	1436	MA	Sham PM	NDI Symptoms QoL	MA> sham MA> PM QoL	Acupuncture better than Sham acupuncture	prokinetics



Abbreviations

FD	functional dyspepsia
FIGDs	functional gastrointestinal disorders
TCM	traditional Chinese medicine
MA	manual acupuncture
Mox	moxibustion
AM	acupuncture-moxibustion
EA	electroacupuncture
GI	gastro-intestinal
WN	warming needle
FN	fire needling
AT	auriculotherapy
CT	cupping therapy
CWM	Conventional Western Medicine
TEAS	transcutaneous electrical acupoint stimulation
ACE	acupoint catgut embedding
SID	symptom index of dyspepsia
HADS	hospital anxiety and depression scale
NDI	Nepean dyspepsia index
PM	pharmacologic medicine
EGG	Electrogastrogram
GET	Gastric Emptying time
HRV	heart rate variability
QoL	Quality of life
SAS	self-rating anxiety scale
SDS	self-rating depression scale
HAMA	Hamilton anxiety rating scale
HAMD	Hamilton depression rating scale
HADS	Hospital anxiety and depression scale

