



Case Report

Daejang-hwan for Functional Gastrointestinal Disorders: Therapeutic Effects Through Regulation of Gi-Gi Seung-Gang and Autonomic Symptom Improvement

Ji-Myung Ahn¹, Sang-Moon Lee^{1,2}, Byung-Tae Bae³, Ho-Je Park^{2,4}, Kang-Min Park⁵, Sang-Hyun Ahn^{2*}

¹ Seolmyeong Korean Medicine Clinic, Gumi-si, Gyeongsangbuk-do, Republic of Korea

² Department of Anatomy, College of Korean Medicine, Semyung University, Jecheon-si, Chungcheongbuk-do, Republic of Korea

³ Sangmo Seolmyeong Korean Medicine Clinic, Gumi-si, Gyeongsangbuk-do, Republic of Korea

⁴ Goesan-gun Public Health Center, Goesan-gun, Chungcheongbuk-do, Republic of Korea

⁵ Uiseong-gun Public Health Center, Uiseong-gun, Chungcheongbuk-do, Republic of Korea



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Corresponding Author:

Sanghyun Ahn

Department of Anatomy, College of Korean Medicine, Semyung University, 65 Semyung-ro, Jecheon-si, Chungcheongbuk-do(27136), Republic of Korea

Tel: +82-10-8511-6559

Fax: +82-43-649-1702

Email: smkmana@semyung.ac.kr

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Abstract

Background/Objectives: In Korean medicine, functional gastrointestinal (GI) disorders are attributed to dysregulation of *gi-gi seung-gang* (氣機升降) involving the liver, spleen, and heart. Emotional stress may induce liver qi stagnation, impairing spleen–stomach function and contributing to GI and psychosomatic symptoms. Daejang-hwan (大腸丸) is commonly used for constipation, irritable bowel syndrome (IBS), and dyspepsia. This study evaluated clinical outcomes of Daejang-hwan and its association with autonomic-related symptoms

Methods: This retrospective observational study analyzed 40 adults with IBS, functional dyspepsia (FD), or chronic constipation treated between April and November 2025. Daejang-hwan was administered twice daily for a mean of 6.8 weeks. GI symptoms were assessed using the Numerical Rating Scale (NRS), and autonomic-related symptoms were evaluated by patient reports. Pre–post comparisons and correlation analyses were conducted

Results: Total GI symptom NRS scores decreased from 8.4 ± 1.3 to 2.0 ± 0.8 (76.2% improvement, $p < 0.001$). Improvements were observed in IBS (80.2%), constipation (75.6%), and FD (74.7%) (all $p < 0.001$), with normalization of bowel patterns. Autonomic-related symptom severity also improved (7.2 ± 1.6 to 2.2 ± 1.1 , $p < 0.001$) and correlated with GI symptom improvement ($r = 0.72$, $p < 0.001$).

Conclusions: Daejang-hwan was associated with significant improvement in functional GI symptoms and concurrent improvement in autonomic-related symptoms. These findings support an integrative model linking qi regulation with the gut–brain axis and warrant prospective controlled studies using objective biomarkers.

Keywords: Gut–brain axis, Autonomic nervous system, Irritable bowel syndrome, functional gastrointestinal disorders, Daejang-hwan

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Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

Conceptualization, J.-M.A. and S.-M.L.; methodology, B.-T.B.; formal analysis, H.-J.P. and K.-M.P.; investigation, J.-M.A. and B.-T.B.; data curation, J.-M.A.; writing—original draft preparation, J.-M.A. and S.-M.L.; writing—review and editing, S.-H.A.; supervision, S.-M.L. and S.-H.A. All authors have read and agreed to the published version of the manuscript.

Introduction

Irritable bowel syndrome (IBS), functional dyspepsia (FD), and constipation are representative functional gastrointestinal (GI) disorders characterized by abdominal pain, bloating, and altered bowel habits in the absence of identifiable structural abnormalities. These conditions affect approximately 10–15% of the global population and are associated with chronic symptoms that significantly impair quality of life and impose a substantial socioeconomic burden.

From a biomedical perspective, functional GI disorders are considered multifactorial conditions involving dysregulation of the gut–brain axis, imbalance of the autonomic nervous system, abnormalities in gastrointestinal motility, gut microbiota dysbiosis, and immune activation. Chronic psychological stress is known to activate the hypothalamic–pituitary–adrenal (HPA) axis, leading to sympathetic nervous system hyperactivity. This neuroendocrine imbalance contributes to disturbed gastrointestinal motility, increased intestinal permeability, and inflammatory responses, thereby exacerbating GI symptoms.

In Korean medicine, functional GI disorders are primarily understood as disorders of the qi mechanism (*gi-gi seung-gang*), reflecting impaired regulation of ascending and descending qi functions. This process is closely associated with functional imbalances of the Liver, Spleen, and Heart. Classical medical theory describes that emotional stress disrupts the Liver's coursing and discharge function, resulting in Liver qi stagnation. When qi flow becomes obstructed, qi stasis and counterflow may occur, and the invasion of stagnant Liver qi into the Spleen and Stomach impairs transportation and transformation, leading to abnormal intestinal conduction [1,2]. Clinically, this manifests as alternating diarrhea and constipation, abdominal bloating, dyspepsia, abdominal pain, and accompanying psychosomatic symptoms such as anxiety and sleep disturbance [3,4].

Notably, the traditional concept of qi mechanism dysregulation shows conceptual parallels with modern physiological models of the autonomic nervous system and the gut–brain axis. The Liver's regulatory function may be interpreted in relation to sympathetic nervous system activity, the Spleen's transportation and transformation function to parasympathetic regulation of digestion, and the Heart's governance of spirit-mind to central nervous system integration of emotional and stress responses. These correspondences suggest the feasibility of an integrative framework bridging traditional Korean medicine and contemporary neurogastroenterology.

Daejang-hwan is a traditional multi-herbal formula commonly prescribed to relieve intestinal heat accumulation and promote intestinal conduction, and has been widely used for the treatment of constipation, IBS, and FD. However, clinical evidence supporting its potential effects beyond bowel regulation, particularly in relation to autonomic nervous system modulation and psychosomatic stabilization, remains limited.



Therefore, this retrospective study aimed to analyze clinical data from patients with IBS, FD, and constipation treated with Daejang-hwan to evaluate changes in GI symptoms and to examine associations between GI symptom improvement and autonomic nervous system–related symptoms, thereby providing preliminary clinical evidence for qi mechanism–based autonomic regulation and a foundation for future prospective studies incorporating objective biomarkers.

Materials & Methods

This case report was conducted as a retrospective review of clinical records obtained during routine outpatient care. All patients provided prior informed consent allowing their de-identified clinical data to be used for academic and publication purposes. Personal identifiers were removed before analysis, and the study was conducted in accordance with the principles of the Declaration of Helsinki. As this report was based solely on routinely collected medical records and involved no additional intervention, institutional review board approval was waived.

Cases were selected from adult patients who visited Seolmyeong Korean Medicine Clinic and Sangmo Seolmyeong Korean Medicine Clinic in Gumi, Republic of Korea, between April and November 2025. Patients were included if they were 19 years of age or older, diagnosed with a functional gastrointestinal disorder—specifically irritable bowel syndrome, functional dyspepsia, or chronic constipation—and prescribed Daejang-hwan as a main component of their treatment. Only patients with sufficient clinical documentation describing symptom changes before and after treatment were considered for inclusion. The purpose of case selection was to describe clinical courses and treatment responses observed in real-world practice rather than to perform comparative efficacy analyses.

Diagnoses were established based on clinical symptoms, medical history, and physical examination findings. Irritable bowel syndrome and functional dyspepsia were assessed with reference to the Rome IV diagnostic criteria [7], while chronic constipation was defined by reduced bowel movement frequency, difficulty with defecation, and hard stool consistency. Patients with suspected organic gastrointestinal diseases were excluded based on medical history and available diagnostic information. Daejang-hwan was administered orally twice daily, approximately 30 minutes before meals. Treatment duration varied according to individual clinical response, with a mean treatment period of approximately 6.8 weeks. In some cases, additional Korean medicine interventions such as acupuncture or other herbal prescriptions were provided at the clinician's discretion. However, this report focused on the clinical course observed following Daejang-hwan administration.

Daejang-hwan consists of the following main components: psyllium husk, which acts as a soluble fiber promoting intestinal motility and serving as a prebiotic [8–13]; *Houttuynia cordata*, which exhibits anti-inflammatory and antioxidant properties [14–18]; *Citrus aurantium*,



traditionally used to promote qi movement and intestinal motility [19–23]; *Ulmus davidiana* bark, known for anti-inflammatory and mucosal protective effects [24–26]; and inulin, a prebiotic fiber that promotes beneficial gut bacteria and short-chain fatty acid production [27–32]. Clinical outcomes were evaluated using patient-reported symptom changes. Gastrointestinal symptom severity, including abdominal pain, bloating, and defecation discomfort, was assessed using the Numerical Rating Scale (NRS), an 11-point scale ranging from 0 (no symptoms) to 10 (worst imaginable symptoms). The NRS has been validated for use in IBS and functional dyspepsia [33–36]. NRS scores were recorded at baseline and during follow-up visits, and the final recorded score was used to describe post-treatment status. Changes in bowel habits were evaluated by documenting weekly bowel movement frequency and stool form using the Bristol Stool Scale [37], with shifts toward normal stool frequency and consistency considered clinically meaningful.

Symptoms potentially related to autonomic nervous system imbalance, such as anxiety, tension, and sleep disturbance, were assessed based on patient self-reports during clinical interviews and documented over the treatment course. Safety was monitored throughout treatment, and any adverse events, including their type, severity, and duration, were recorded. No serious adverse events requiring treatment discontinuation were observed.

Outcome data were analyzed descriptively in consideration of the case-based nature of this report. Changes in symptoms and bowel patterns were summarized to illustrate clinical trends, and the relationship between gastrointestinal symptom improvement and autonomic-related symptoms was interpreted qualitatively. No causal inferences were intended.

Results

Patient Characteristics

A total of 40 adult patients were included in this case-based analysis. The cohort consisted of 12 men (30.0%) and 28 women (70.0%), with a mean age of 42.3 ± 12.8 years. The clinical diagnoses included irritable bowel syndrome in 11 patients (27.5%), chronic constipation in 13 patients (32.5%), and functional dyspepsia in 16 patients (40.0%). The mean duration of symptoms prior to treatment was 28.6 ± 24.3 months, indicating a predominantly chronic disease course. Daejang-hwan was administered for a mean treatment period of 6.8 ± 3.2 weeks. These patients were managed in routine clinical practice, and baseline demographic and clinical characteristics were comparable across diagnostic categories

Table 1. General Characteristics of study participants (n=40)

Characteristic	Total (n=40)
Age (years)	42.3 ± 12.8

Sex (%)	12 Males (30.0%) 28 Females (70.0%),
Diagnosis (%)	Irritable bowel syndrome in 11 patients (27.5%) Chronic constipation in 13 patients (32.5%) Functional dyspepsia in 16 patients (40.0%)
Disease Duration (months)	28.6 ± 24.3
Treatment Duration (weeks)	of 6.8 ± 3.2

Changes in Gastrointestinal Symptom Severity

Following treatment with Daejang-hwan, overall gastrointestinal symptom severity showed marked improvement. In the total patient cohort, mean NRS scores decreased from 8.4 ± 1.3 at baseline to 2.0 ± 0.8 after treatment, corresponding to an average symptom improvement rate of 76.2%.

When analyzed by diagnostic category, consistent symptom improvement was observed across all functional gastrointestinal disorders (Table 2). Patients with irritable bowel syndrome demonstrated a reduction in NRS scores from 9.1 ± 0.9 to 1.8 ± 0.6 , reflecting an 80.2% improvement. In patients with chronic constipation, NRS scores decreased from 7.8 ± 1.5 to 1.9 ± 0.9 , corresponding to a 75.6% improvement. Similarly, patients with functional dyspepsia showed a reduction from 8.3 ± 1.2 to 2.1 ± 0.8 , representing a 74.7% improvement.

Across diagnostic subgroups, symptom severity consistently shifted from a severe baseline level to mild or minimal levels following treatment, indicating a clinically meaningful improvement in gastrointestinal symptoms during the treatment period.

Table 2. Change in NRS Scores by Diagnosis

Diagnosis	Pre-treatment NRS	Post-Treatment NRS	Change	Improvement Rate(%)	p-value
IBS	9.1 ± 0.9	1.8 ± 0.6	-7.3 ± 1.1	80.2	<0.001
Constipation	7.8 ± 1.5	1.9 ± 0.9	-5.9 ± 1.3	75.6	<0.001
Functional dyspepsia	8.3 ± 1.2	2.1 ± 0.8	-6.2 ± 1.0	74.7	<0.001
Total	8.4 ± 1.3	2.0 ± 0.8	-6.4 ± 1.2	76.2	<0.001

Changes in Gastrointestinal Symptom Severity

Changes in bowel movement patterns were evaluated to assess secondary clinical outcomes following Daejang-hwan treatment. Distinct but complementary patterns of



improvement were observed in patients with irritable bowel syndrome and chronic constipation.

In patients with irritable bowel syndrome, bowel movement frequency decreased from a high baseline level toward a more normalized range. The mean weekly bowel movement frequency declined from 10.2 ± 3.4 before treatment to 6.8 ± 1.2 after treatment. Stool consistency also improved markedly, shifting from predominantly loose or diarrheal stools toward normal form, as reflected by a change in the Bristol Stool Scale score from 6.2 ± 0.8 to 4.1 ± 0.6 . In parallel, abdominal bloating severity showed a substantial reduction, with mean NRS scores decreasing from 7.8 ± 1.3 at baseline to 2.3 ± 0.9 after treatment.

In patients with chronic constipation, bowel habits improved in the opposite but clinically appropriate direction (Table 3). Weekly bowel movement frequency increased from 2.1 ± 0.8 before treatment to 5.8 ± 1.1 following treatment. Stool consistency improved from a constipation-dominant pattern to near-normal form, with Bristol Stool Scale scores increasing from 1.8 ± 0.6 to 3.9 ± 0.7 . Additionally, defecation-related straining decreased notably, with NRS scores declining from 7.2 ± 1.5 to 2.4 ± 0.8 .

Overall, bowel movement patterns in both diagnostic groups shifted toward normalization following treatment, indicating clinically meaningful improvement in intestinal motility, stool consistency, and defecation-related discomfort.

Changes in Autonomic Nervous system-Related Symptoms

Across the total patient cohort, symptoms related to autonomic nervous system imbalance—including anxiety, tension, and sleep disturbance—showed marked improvement in parallel with gastrointestinal symptom relief. Mean NRS scores for autonomic-related symptoms decreased from 7.2 ± 1.6 at baseline to 2.2 ± 1.1 after treatment, corresponding to an average improvement rate of 69.8%.

Correlation analysis demonstrated a strong positive association between improvements in gastrointestinal symptoms and reductions in anxiety severity (Pearson's $r = 0.72$, $p < 0.001$), indicating that autonomic-related symptoms tended to improve concurrently as gastrointestinal symptoms were alleviated.

Representative Cases

To illustrate the clinical course and treatment response, three representative cases with meaningful outcomes are presented below.

**Case 1: Irritable Bowel Syndrome (Male, 40 years)**

The patient presented with frequent loose stools occurring multiple times daily, severe abdominal bloating, and excessive intestinal gas for approximately six months. At baseline, the overall gastrointestinal symptom severity was rated as 10/10 on the NRS, and watery stools corresponding to Bristol Stool Scale types 6–7 accounted for approximately 80% of bowel movements. Following three consecutive 4-week courses of Daejang-hwan in combination with acupuncture and herbal decoction therapy, the NRS score decreased to 1/10, indicating approximately 90% symptom improvement. Stool frequency decreased markedly, stool consistency normalized to Bristol type 4, and abdominal bloating and gas resolved. Concomitant gastroesophageal reflux symptoms and anxiety-related complaints also improved substantially.

Case 2: Chronic Constipation (Female, 26 years)

This patient reported hard, lumpy stools occurring every 2–3 days, accompanied by abdominal bloating. Baseline body weight was 74.5 kg, with a visceral fat level of 11. Daejang-hwan was administered in repeated 4-week cycles alongside dietary management–focused herbal therapy and abdominal acupuncture over a six-month period. Following treatment, bowel movements normalized to once daily. Body weight decreased to approximately 51 kg, representing a total weight reduction of 16 kg, with a decrease in visceral fat level from 11 to 5. The patient also reported improved morning vitality and overall physical well-being, with preservation of muscle mass.

Case 3: Chronic Constipation (Female, 35 years)

The patient experienced chronic constipation (bowel movements every 2–3 days) since childbirth in 2013, along with nocturia, sleep disturbance, and irregular lifestyle patterns related to shift work. Baseline body weight was 86.4 kg. After one month of Daejang-hwan treatment combined with longer-term weight management therapy, acupuncture, and pharmacopuncture, bowel habits normalized to once daily with improved stool consistency. Sleep quality improved, nocturia resolved, and body weight decreased to 72.3 kg, reflecting a total reduction of 14.1 kg. Overall discomfort and daily functional impairment were markedly reduced.

Representative Cases

During the observation period, mild adverse events were reported in two patients (5.0%). One patient experienced transient diarrhea lasting one day during the initial treatment phase, and another reported mild abdominal discomfort lasting two days. Both events resolved spontaneously without the need for treatment discontinuation. No clinically



significant abnormalities were observed in laboratory assessments, including liver and renal function tests, during the treatment period

Discussions

This retrospective study showed that Daejang-hwan was associated with marked improvement in functional gastrointestinal disorders, including irritable bowel syndrome, chronic constipation, and functional dyspepsia. Overall gastrointestinal symptom severity decreased by 76.2%, a change exceeding the established minimal clinically important difference for NRS-based outcomes [33], indicating clinically meaningful improvement. Importantly, gastrointestinal symptom relief was accompanied by significant improvement in autonomic nervous system–related symptoms such as anxiety, tension, and sleep disturbance. The strong correlation between gastrointestinal symptom improvement and anxiety reduction supports the close interaction between gut function and autonomic regulation, consistent with the gut–brain axis concept [38,39,43,44]. Previous studies have demonstrated that predominant symptoms in IBS correlate with specific autonomic abnormalities [45], and that autonomic nervous system activity is altered in functional bowel disorders [46,47]. These observations align with the concurrent improvement of both gastrointestinal and psychosomatic symptoms observed in the present study.

The therapeutic effects of Daejang-hwan may be explained by complementary mechanisms of its components. Soluble fibers such as psyllium and inulin likely contributed to normalization of bowel motility and stool form [10,11] while also exerting prebiotic effects that promote beneficial gut bacteria and short-chain fatty acid (SCFA) production [27–32,40,41]. SCFAs, particularly butyrate, modulate gut motility and may influence gut–brain signaling via vagal pathways [42]. Citrus aurantium may have enhanced intestinal smooth muscle activity [20–22], and anti-inflammatory and mucosal-protective actions of *Houttuynia cordata* and *Ulmus davidiana* may have supported intestinal barrier recovery [15,16,24,25]. Furthermore, gut microbiota regulation of serotonin biosynthesis [43,44] may represent an additional pathway linking intestinal and autonomic function. From an integrative perspective, these findings align with the Korean medicine concept of gi-gi seung-gang regulation, in which harmonization of liver, spleen, and heart functions corresponds to restoration of autonomic balance [5,6]. Thus, Daejang-hwan may exert both gastrointestinal and psychosomatic benefits through convergent traditional and modern physiological mechanisms.

This study is limited by its retrospective design, lack of a control group, small sample size, and concomitant use of other treatments. Objective biomarkers of autonomic function and gut microbiota were not assessed. Future prospective controlled studies



incorporating measures such as heart rate variability, cortisol, and microbiome-derived metabolites are needed to confirm these findings and clarify underlying mechanisms.

Conclusions

Daejang-hwan was associated with significant improvement in functional gastrointestinal disorders, including irritable bowel syndrome, constipation, and functional dyspepsia, with an overall symptom improvement rate of 76.2%. Gastrointestinal symptom relief showed a strong correlation with improvement in autonomic nervous system-related symptoms, supporting the close interaction between gut function and autonomic regulation. These findings suggest that Daejang-hwan may exert integrative therapeutic effects through combined regulation of bowel function, gut microbiota, and the gut-brain axis, aligning traditional qi mechanism theory with modern neurogastroenterological concepts. Further prospective studies with objective biomarkers are required to confirm these results.

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