Concordance Analysis of Constipation Symptoms and Objective Examinations in Patients with Functional Constipation: Post-print

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Abstract

Objective: To analyze the consistency between symptom-based classification and objective examination-based classification in patients with functional constipation. (The research objective is not very clear; it is recommended that the objective be simple and precise. The objective of this study, "To analyze the consistency between symptom-based classification and objective examination-based classification in 40 patients with functional constipation, aiming to establish a diagnostic classification for functional constipation patients and propose guiding preventive and therapeutic recommendations to improve patients' quality of life," is inconsistent with the text; a precise description is recommended.)

Methods: A total of 40 patients with functional constipation (including outpatients and inpatients) who visited the Department of Gastroenterology at Hebei Provincial People' s Hospital from January 2018 to August 2021 were retrospectively collected. A questionnaire was used to inquire about the patients' weekly frequency of spontaneous bowel movements, Bristol stool form, and the presence of clinical symptoms such as straining during defecation, a sensation of anorectal obstruction during defecation, need for manual assistance to facilitate defecation, and a feeling of incomplete evacuation. All patients completed relevant auxiliary examinations including anorectal manometry, colonic transit time, and defecography. The consistency between classification based on constipation symptoms and classification based on colorectal and anorectal function test results was analyzed.

Results: 1. The consistency between symptom-based classification and anorectal manometry-based classification was poor (P=0.502, K=-0.123). 2. The consistency between symptom-based classification and defecography-based classification was poor (P=0.794, K=-0.04). 3. The consistency between symptom-based classification and colonic transit time-based classification was poor (P=0.215,

K=-0.14). 4. The consistency between symptom-based classification and objective examination-based classification was poor (P=0.944, K=-0.005).

Conclusion: There are differences between classification based on patients' clinical symptoms and classification based on colorectal and anorectal function tests; individualized analysis is required when determining the classification in clinical practice.

Full Text

Abstract

Objective: To analyze the consistency between symptom-based classification and objective examination-based classification in 40 patients with functional constipation (FC), aiming to provide diagnostic classification and guide preventive and therapeutic recommendations to improve patients' quality of life.

Methods: We retrospectively collected 40 FC patients (both outpatients and inpatients) from the Department of Gastroenterology at Hebei Provincial People' s Hospital between January 2018 and August 2021. A questionnaire survey was administered to assess weekly spontaneous bowel movements, Bristol stool form, and clinical symptoms including straining, anorectal blockage sensation, manual assistance requirement, and incomplete evacuation. All patients completed anorectal manometry (ARM), colonic transit time (CTT) measurement, and defecography. We analyzed the consistency between constipation symptom classification and colorectal-anorectal function test results.

Results: 1) Poor consistency was found between symptom classification and ARM classification (P=0.502, K=-0.123). 2) Poor consistency was observed between symptom classification and defecography classification (P=0.794, K=-0.04). 3) Poor consistency existed between symptom classification and CTT classification (P=0.215, K=-0.14). 4) Overall poor consistency was demonstrated between symptom classification and comprehensive objective examination classification (P=0.944, K=-0.005).

Conclusion: Classification based on clinical symptoms differs from classification based on colorectal-anorectal function examinations. Individualized analysis is required when determining subtypes in clinical practice.

Keywords: Functional constipation; Anorectal manometry; Defecography; Colonic transit time

Introduction

Functional constipation (FC) is one of the most prevalent diseases affecting patient quality of life. Epidemiological surveys in China report a chronic constipation prevalence of 4-10% [1]. The Rome diagnostic criteria for FC include six symptoms: reduced defecation frequency, dry/hard stool form, straining during defecation, sensation of anorectal obstruction, need for manual assistance,

and incomplete evacuation [2]. Currently, assessment of constipation severity primarily relies on symptom evaluation.

Gastrointestinal transit time (GITT) measurement, anorectal manometry (ARM), and defecography are commonly used to evaluate colorectal-anorectal function. GITT can determine the presence of colonic motor dysfunction [3], while ARM and defecography assess anorectal motility and sensory function [4,5], helping to elucidate potential pathophysiological mechanisms underlying symptoms. However, few studies have investigated the consistency between symptoms and functional examinations in FC. Therefore, this study aimed to analyze the consistency between clinical symptoms and GITT, ARM, and defecography findings in FC patients.

Methods

Patient Selection

From 60 FC patients (including outpatients and inpatients) who visited the Department of Gastroenterology at Hebei Provincial People' s Hospital between January 2018 and August 2021, we selected 40 patients who completed ARM, defecography, and GITT.

Inclusion Criteria

1) Age 18-85 years (non-elderly group: 18-65 years; elderly group: >65 years)
2) All subjects met Rome IV diagnostic criteria for FC, including:
    - At least two of the following: Straining during $ $50% of defecations; Bristol stool types 1-2 during $ $25% of defecations; Sensation of incomplete evacuation during $ $50% of defecations; Sensation of anorectal obstruction/blockage during $ $25% of defecations; Manual maneuvers required during $ $20% of defecations; Spontaneous bowel movements <3 times per week
    - Rarely loose stools without laxative use
    - Does not meet IBS diagnostic criteria
    - Symptoms present for at least 6 months, with the above criteria met for the past 3 months
3) No organic diseases explaining symptoms were found through routine blood, urine, and stool tests, abdominal CT, ultrasound, gastroscopy, or colonoscopy

Exclusion Criteria

1) Pregnancy, lactation, liver/kidney failure, or history of abdominal surgery/trauma
2) Recent anorectal surgery
3) Severe connective tissue disease, cerebrovascular accident, Parkinson' s syndrome, or organic gastrointestinal disease

Experimental Methods

This retrospective study compared the consistency between clinical symptom classification and ARM, defecography, and GITT results.

1) **Symptom Assessment:** We surveyed constipation symptoms including weekly spontaneous bowel movements, Bristol stool form scale, straining, anorectal blockage sensation, manual assistance requirement, and incomplete evacuation frequency. Patients were classified based on symptoms into: slow transit constipation (STC) symptom cluster ($ $3 spontaneous bowel movements/week, Bristol types 1-2), defecatory disorder symptom cluster (primarily straining, blockage sensation, manual assistance, and incomplete evacuation, with $ $2 symptoms present $ $50% of the time at moderate severity or higher), or mixed symptom cluster (presence of both groups of symptoms).

2) **Anorectal Manometry:** ARM evaluates anorectal motility and sensory function, identifying paradoxical sphincter or pelvic floor muscle contraction during attempted defecation, inadequate rectal pressure increase, absent rectoanal inhibitory reflex, and rectal sensory thresholds. ARM can detect structural and functional abnormalities, including puborectalis muscle dysfunction, and is suitable for constipation patients with defecatory disorders.

3) **Colonic Transit Time:** GITT primarily measures colonic transit. Patients discontinued laxatives, enemas, or suppositories 5 days before examination. On the test day, they ingested a capsule containing 24 radiopaque PVC markers. Abdominal radiographs were taken at 4h, 24h, 48h, and 72h after ingestion. If $ $6 markers remained in the colon at 72h, imaging was extended to day 5 [6]. GITT aids STC diagnosis (slow transit: $ $6 markers at 72h or scattered throughout colon; outlet obstruction: transit index >0.6 for 2 consecutive days, $ $0.75 on final day; mixed: both slow transit and outlet obstruction with transit index = 0.5).

4) **Defecography:** This imaging technique assesses rectal and pelvic floor activity during simulated defecation using thickened barium paste. It simultaneously evaluates structural abnormalities (rectocele, rectal prolapse, enterocele, megacolon) and functional evacuation disorders (anorectal angle changes at rest and during straining, puborectalis muscle spasm, rectal emptying). Defecography is used for defecatory disorder-type constipation, particularly when structural changes are suspected.

5) **Comprehensive Classification:** Based on combined ARM, defecography, and GITT results, patients were classified as having slow transit ($ $6 markers at 72h or scattered throughout colon), defecatory disorder (paradoxical contraction on ARM or structural/functional abnormalities on defecography), or mixed type (both slow transit and defecatory disorder). We compared the consistency between symptom-based classification

and objective examination-based classification.

Statistical Analysis

SPSS 25.0 software was used for statistical analysis. The Kappa coefficient tested inter-group consistency: Kappa $ 0.75*indicatedgoodagreement*; 0.4 $Kappa<0.75 indicated moderate agreement; Kappa<0.4 indicated poor agreement.

Results

Symptom Classification Results

Among symptom classifications, STC, defecatory disorder, and mixed symptom clusters accounted for 27.5% (11/40), 20% (8/40), and 37.5% (15/40) respectively, while 15% (6/40) had dispersed symptoms that did not fit these categories.

ARM Classification Results

Based on ARM, 80% (32/40) showed paradoxical contraction, indicating defecatory disorder, while 20% (8/40) had normal rectal sensory function.

Defecography Classification Results

Defecography revealed structural abnormalities (rectocele, rectal prolapse, enterocele, megacolon, perineal descent) in 67.5% (27/40), indicating defecatory disorder, while 32.5% (13/40) had normal results.

Colonic Transit Time Classification Results

GITT classification showed 20% (8/40) with STC, 15% (6/40) with defecatory disorder, and 65% (26/40) with normal transit.

Consistency Between Symptom Clusters and Objective Examinations

Symptom clusters classified patients into normal transit constipation (NTC), defecatory disorder, STC, and mixed types, as did the comprehensive objective examinations. Cross-tabulation revealed poor agreement, with weighted Kappa analysis showing poor consistency between symptom classification and objective examination classification (P=0.944, K=-0.005) .

Consistency Between Symptom Clusters and ARM

Among 29 patients with NTC or defecatory disorder symptoms, only 1 showed NTC on ARM, while 5 with NTC symptoms showed defecatory disorder on ARM. Of those with defecatory disorder symptoms, 7 showed NTC on ARM while 16 showed defecatory disorder. Weighted Kappa analysis indicated no significant consistency (P=0.502, K=-0.123) .

Consistency Between Symptom Clusters and Defecography

Among 29 patients with NTC or defecatory disorder symptoms, 2 with NTC symptoms had normal defecography, while 4 showed defecatory disorder. Of those with defecatory disorder symptoms, 9 showed NTC on defecography while 14 showed defecatory disorder. Weighted Kappa analysis indicated no significant consistency (P=0.794, K=-0.04) .

Consistency Between Symptom Clusters and Colonic Transit Time

Among 32 patients with NTC or STC symptoms, 27 were eligible for analysis after excluding those diagnosed with defecatory disorder by GITT. Results showed 3 with NTC symptoms had normal transit, 3 had STC, 16 with STC symptoms had normal transit, and 5 had STC. Weighted Kappa analysis indicated no significant consistency (P=0.215, K=-0.14) .

Discussion

FC is a major cause of chronic constipation. Like other functional disorders, FC shows no obvious organic lesions, and its pathophysiology remains unclear. Clinical research suggests FC can be divided into four subtypes based on pathophysiological mechanisms: NTC, STC, defecatory disorder, and mixed type [6]. Correct classification guides treatment selection. Studies have shown that adding prokinetic agents to bulk or osmotic laxatives effectively improves STC [7,8], increased dietary fiber benefits STC patients [9,10], and fecal microbiota transplantation works best for STC [11,12]. Defecatory disorder patients primarily require biofeedback therapy, which significantly improves symptoms in those unresponsive to conventional medications [13].

Some studies suggest that clinical symptoms can infer underlying pathophysiological mechanisms to guide treatment [14], while others find symptom-based classification unreliable for guiding therapy [15,16]. Research indicates Chinese chronic constipation patients often have comorbid psychological abnormalities [17], with constipation and psychological factors having a bidirectional relationship [18]. FC patients are often anxious and hypervigilant about symptoms, potentially overestimating straining and incomplete evacuation sensations.

Studies have found that stool consistency correlates highly with colonic slow transit [19] and moderately with colonic transit time [20], while reduced defecation frequency and abdominal distension also suggest STC [21]. However, Yu et al. [22] found no significant correlation between FC symptoms and objective examinations, consistent with our results. The main STC symptoms are dry stool and reduced frequency, but accurate recall is challenging. Research on elderly patients' recall accuracy found some overestimated stool hardness compared to prospective records [15]. Factors affecting stool form and frequency include recall bias, physical activity, diet, and laxative use. Studies show patients objectively diagnosed with STC may report normal or loose stools, especially after

laxatives [16]. Therefore, inferring STC from symptoms requires comprehensive consideration of multiple factors.

ARM primarily evaluates anorectal motility and sensory function, diagnosing defecatory disorders by identifying paradoxical contraction, inadequate rectal pressure, absent rectoanal inhibitory reflex, and sensory threshold abnormalities [23]. Defecography assesses rectal and pelvic floor activity during simulated defecation, evaluating both structural abnormalities and functional evacuation disorders, particularly useful for diagnosing defecatory disorders with structural changes [24]. Our study showed poor consistency between symptom-based and objective examination-based diagnoses of defecatory disorder. International research indicates that manual assistance and rectal blockage sensation have some specificity for defecatory disorder [16], but stool consistency influences these symptoms [25]. Straining only has diagnostic significance for paradoxical anal motion when stool is not dry. Chinese scholars note that reporting thin stool with persistent blockage or incomplete evacuation sensation after laxatives may guide defecatory disorder diagnosis [8]. Thus, diagnosing defecatory disorders based solely on symptoms is challenging.

Conclusion

FC patients predominantly present with mixed-type symptoms, while objective examinations mainly reveal defecatory disorders, likely related to disease duration, psychological factors, laxative use, age, and gender. Classification based solely on symptoms requires excluding many subjective factors and is therefore difficult. Due to the small sample size, conclusions should be interpreted cautiously, with further clarification of clinical significance and implications for future study design.

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Note: Figure translations are in progress. See original paper for figures.