



The Associations Among Symptoms, Quality of Life, and Gastric Emptying: An Unresolved Issue

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Article: Association between symptoms, quality of life, and gastric emptying in dyspeptic patients
Wuestenberg F, Juge M, Melchior C, Desprez C, Leroi AM, Gourcerol G
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Functional dyspepsia (FD) is a chronic disorder of gastroduodenal function that is characterized by one or more of the following symptoms: epigastric pain, epigastric burning, postprandial fullness, and early satiation in the absence of any organic disease that is likely to explain the symptoms.¹ A recent meta-analysis indicated that the overall pooled prevalence of dyspepsia is 21% and varies among countries and according to the definition of dyspepsia.²

Patients with dyspepsia have reduced health related quality of life (HRQOL) because of their symptoms.¹ HRQOL describes patients' perceived physical and mental health status. FD is not related to increased mortality. Therefore, HRQOL assessment is important to understand the impact of disease and treatments on patients.

Controversy exists as to whether delayed gastric emptying is related to specific symptoms or symptom severity (Table). A few studies indicated that gastric emptying may not be useful for stratifying patients with FD regardless of how the data were analyzed.³⁻⁶ However, postprandial fullness has been reported to be significantly related to impaired gastric emptying.⁷⁻¹² Specifically, Stanghellini et al⁷ reported that female sex, relevant and severe postprandial fullness, and severe vomiting are independently associated with delayed

gastric emptying of solids.

Controversy also exists over whether gastric emptying impacts on the HRQOL in patients with dyspepsia (Table). Talley et al¹³ reported that patients with dysmotility-like symptoms had significantly worse HRQOL than those with ulcer-like symptoms. In the population based cross-sectional endoscopic study applying the Rome III definition for FD, postprandial distress syndrome impair HRQOL in all short form-36 domain more than epigastric pain syndrome.¹⁴ These observations suggest the possibility that gastric emptying may have a significant impact on HRQOL in patients with FD.

In this issue of *Journal of Neurogastroenterology and Motility*, Wuestenberg et al¹⁵ assessed association between symptoms and gastric emptying in 198 patients with dyspepsia. The main findings were that there was no association between symptoms, quality of life, and gastric emptying in their population. However, there was a significant association among symptoms, quality of life, and gastric emptying in their analysis using a different criteria (ie, $T_{1/2} = 200$ minutes). That means that patients with severely delayed gastric emptying had worse symptoms and poorer quality of life. Given this finding, the authors questioned the traditional reference value of

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Table. Literature Review on Association Among Symptoms, Quality of Life, and Gastric Emptying in Patients With Dyspepsia

Primary author	Year	Nation	Study population	Methods used	Symptoms ^a	QOL	Comments
Stanghellini ⁷	1996	Italy	Rome IIFD (n = 304)	GES	Severe postprandial fullness (OR 3.78), severe vomiting (OR 4.04)	NA	Female sex, relevant and severe postprandial fullness, and severe vomiting are independently associated with delayed gastric emptying of solids.
Perri ⁸	1998	Italy	Rome IIFD (n = 343)	¹³ C octanoic gastric emptying test	Postprandial fullness, nausea, vomiting	NA	<i>H. pylori</i> status had no influence on gastric emptying
Talley ³	1989	Australia	Dyspeptic patients (n = 32)	GES	No	NA	Gastric emptying of solids was slightly delayed in females with dyspepsia.
Guo ¹⁹	2001	US	Dyspeptic patients (n = 129)	GES	Greater symptom score	NA	Extending gastric emptying scintigraphy from 2 to 4 hours detects more patients with gastroparesis.
Talley ⁴	2001	Australia	Rome IIFD (n = 551) Dyspeptic patients with DM	GES, NDI	No	No	Symptom prevalence and severity were similar in dyspeptic patients with and without delayed gastric emptying.
Sarnelli ⁹	2003	Belgium	Rome IIFD (n = 392)	GES	Vomiting (OR 2.65), postprandial fullness (OR 3.08)	NA	Demographic factors and <i>H. pylori</i> status do not differ between patients with normal or with delayed gastric emptying.
Talley ¹⁰	2006	US	Rome IIFD (n = 864)	GES, SF-36, NDI	Postprandial fullness (OR 1.98)	No	Female, epigastric pain, and nausea were associated with impaired QOL.
van Lelyveld ⁵	2008	Netherlands	Rome IIFD (n = 60)	¹³ C octanoic gastric emptying test	No	NA	A delayed gastric emptying rate, defined as a half emptying time ≥ 120 min and/or a retention after 120 min $\geq 40\%$.
Cassilly ²⁰	2008	US	Dyspeptic patients (n = 226)	GES	Nausea, vomiting	NA	The total or average GCSI score did not reliably predict the diagnosis of gastroparesis.
Punkkinen ⁶	2008	Finland	Dyspeptic patients with type 1 DM (n = 27)	GES	No	NA	Impaired gastric emptying of solids in patients with Type 1 diabetes is related to autonomic neuropathy.
Pathikonda ¹¹	2012	US	Dyspeptic patients (n = 1449)	GES	Early satiety, postprandial fullness, vomiting, loss of appetite	NA	Gastric retention at 1 hour may miss 36% of patients found to have delayed gastric emptying at 4 hours.
Guo ²¹	2012	China	Rome IIIIFD (n = 93)	GES	No	NA	Presence of nausea was associated with delayed gastric emptying of the proximal stomach.
Ardila-Hani ²²	2013	US	Dyspeptic patients (n = 717)	GES	Vomiting, loss of appetite	NA	Symptoms cannot distinguish between degrees of delayed or rapid gastric emptying.
DiBaise ¹²	2016	US	Rome IIIIFD (n = 266)	GES, PAGA-QOL	Nausea, vomiting, postprandial fullness, early satiety, GCSI total score	Yes	Patients with delayed gastric emptying had more severe gastroparetic symptom.
Tseng ²³	2018	US	Rome IIIIFD (n = 172)	GES, PAGA-QOL, SF-12	Higher GCSI	Yes	Results of GES did not help to identify those with improved or worsened symptoms or QOL at follow-up
Asano ²⁴	2017	Japan	Rome IIIIFD (n = 94)	GES	No	NA	PDS type of FD.

^aWhether delayed gastric emptying was associated with a specific symptom pattern or overall symptom severity.

^bWhether quality of life was impaired by delayed gastric emptying.

QOL, quality of life; FD, functional dyspepsia; GES, gastric emptying scintigraphy; OR, odds ratio; NA, not assessed; *H. pylori*, *Helicobacter pylori*; NDI, Nepean dyspepsia index; DM, diabetes mellitus; GCSI, gastroparesis cardinal symptom index; PAGA-QOL, patient assessment of upper gastrointestinal quality of life; PDS, postprandial distress syndrome.

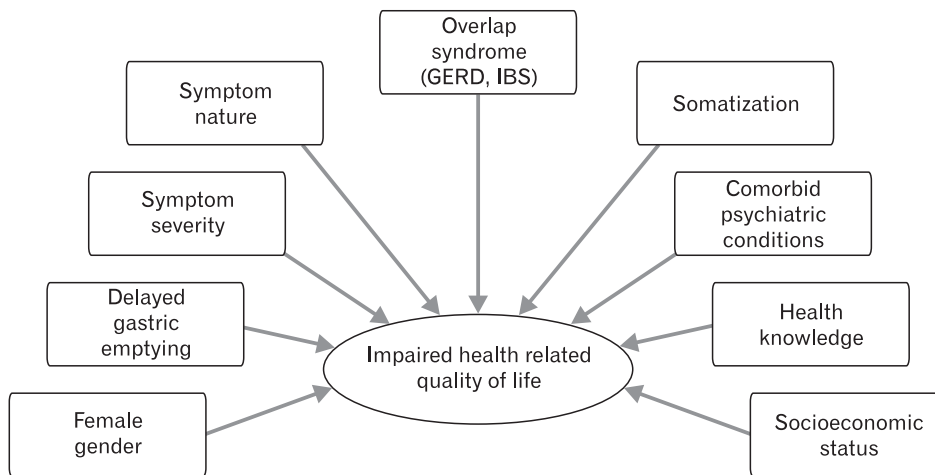


Figure. Putative factors impacting on the health related quality of life in patients with functional dyspepsia. GERD, gastroesophageal reflux disease; IBS, irritable bowel syndrome.

delayed gastric emptying in the assessment of ^{13}C breath test using octanoic acid incorporated into a solid meal. Their study also highlights the need to assess normal values for this test. This breath test, which requiring standardization and validation, is an alternative to gastric emptying scintigraphy.¹⁶ The drawbacks of this gastric emptying breath test are that the reference range depends on the protocol and mathematical analysis method used.¹⁷ Dichotomous value (ie, normal versus abnormal) based on the threshold of 166 minutes in this study potentially undermines the diagnostic utility, and can be misleading. This analysis also erroneously implies that symptoms, quality of life, and gastric emptying were unrelated. Hence, it may be preferable to compare these metrics expressed on a continuous scale. The authors indicated that among the overall population, gastric emptying correlated with symptom severity assessed by total symptom score ($r = -0.215$, $P = 0.002$), quality of life assessed by the gastrointestinal quality of life index (GIQLI; $r = -0.227$, $P = 0.001$), and anxiety and depression assessed by the hospital anxiety depression scale ($r = 0.206$, $P = 0.004$).

Impaired HRQOL in patients with FD is mainly associated with symptom severity (ie, moderate to severe symptoms).¹⁸ Putative factors related to reduced HRQOL include gender, symptom nature (ie, FD subtype), overlap with gastroesophageal reflux disease (GERD) or irritable bowel syndrome (IBS), somatization, comorbid psychiatric conditions such as anxiety and depression, health knowledge, and socioeconomic status (Figure).¹⁸ In particular, overlap conditions with IBS or GERD might be important to understand the impact on HRQOL. Specifically, a population-based study applying the Rome III showed FD overlap both with IBS and GERD had a significant impact on bodily pain.¹⁴ In addition, Wuestenberghs et al¹⁵ reported that patients with IBS present poorer quality of life (GIQLI scores of 71.9 points compared to

83.6 without overlap with IBS, $P = 0.002$). As mentioned above, these factors may be confounders that distort the association among gastric emptying, symptoms and HRQOL. Therefore, the unresolved issue require further large study which utilizes a validated gastric emptying test and minimizes the effects of these confounders during study design and statistical analysis.

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Conflicts of interest: None.

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