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Research Article

The management of upper gastrointestinal symptoms: A study on community pharmacies in Italy

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Abstract

Upper gastrointestinal (GI) symptoms are usual complaints among patients presenting to Italian community pharmacies. However, information on treatment history of those patients is often lacking. This descriptive, cross-sectional study aims at exploring the medication history of individuals with upper GI tract symptoms visiting one of the 20 enrolled community pharmacies, over a period of 7 months, based on the administration of a questionnaire. Of 1,020 interviewees, 62.1% had asked for a medical consultation. The most frequent symptom was epigastric burning (31.8%), followed by acid regurgitation (14.6%) and post-prandial fullness (12.0%). Of the 1,609 therapies, proton pump inhibitors constituted the most represented therapeutic class (35.6%) followed by antacids (17.5%) and alginate-based products (17.2%). In treating symptoms, 38.1% of the patients do not seek medical advice, while 42.0% rely on non-prescription therapies. As findings suggest, support to patients with GI disorders in community pharmacies can be enhanced for a safer self-medication.

Keywords

Proton pump inhibitors; Community Pharmacy; Clinical Pharmacy; Self Medication; Pharmacoepidemiology

Introduction

Upper gastrointestinal (GI) disorders, despite not being life-threatening diseases (Gerson et al. 2000; Mahadeva et al. 2006; Brook et al. 2007), profoundly affect patients' quality of life (Halder et al. 2004; Broker et al. 2009). The ranking of GI disorders in terms of hospital admissions and medicines consumption is one of the highest after cancer and heart diseases (AIFA 2020; NICE 2020). Indeed, 25–40% of the worldwide population have experienced upper GI symptoms (El-Serag and Talley 2004; Zagari et al. 2008; Nirwan et al. 2020; Sperber et al. 2020), such as epigastric pain, epigastric burning, postprandial fullness, upper abdominal bloating, heartburn, or regurgitation, during their lives (Tack et al. 2006; Aziz et al. 2016). With specific reference to Italy, it is estimated that the frequency of the mentioned GI symptoms is higher than 18%. According to ROME IV (Drosseman et al. 2016), which established the criteria for the management of functional GI disorders, functional dyspeptic patients experience symptoms

at least six months before diagnosis, and for at least three months (Stanghellini et al. 2016). However, most patients tend to underestimate upper GI disorders and less than 10% of them seek the medical advice of a gastroenterologist (Haque et al. 2000; Hila and Castell 2003). In addition, patients often try to manage the symptoms by means of non-prescription medicines in a self-administration regime and look for medical advice only when the symptoms become more persistent or severe.

In this regard, it is worth mentioning the overall background that encompasses the realm of possibilities available to the patient within the Italian healthcare system. Indeed, Italian community pharmacies represent an ideal setting for patients, thanks to their wide and capillary distribution throughout the country, not to mention the ease in accessibility that they offer to the entire population. This has been confirmed in the 2019 report from Federfarma (Federfarma 2020), demonstrating that about 4 million Italians enter the pharmacy every day and each pharmacy intercepts about 230 users daily.

As a matter of fact, relying on medical specialists or general practitioners (GP) can constitute sometimes an uncomfortable option from the patient's point of view. Indeed, in the former case, usually the offered service is not free of charge, while in the latter case, substantial wait times may be required for the consultation. By contrast, community pharmacies provide fast, reliable and free of charge consultations in various areas, both clinical and drug-related, by means of trained professionals, namely, pharmacists. Pharmacists not only distribute drugs, but they also provide advice on the management of minor diseases (Giua et al. 2020), promote health education initiatives (Paoletti et al. 2020), carry out screening (Milovanovic et al. 2018; Pappaccogli et al. 2019) and are involved in the promotion and monitoring of the adherence to therapies (Manfrin et al. 2017; Paoletti et al. 2020). These pharmacists' activities also apply to the case of patients suffering from upper GI disorders. Indeed, a large percentage of patients chooses to refer to a pharmacist for immediate and efficient guidelines or to exercise self-medication (Mehuys et al. 2009), rather than relying on gastroenterologists' or physicians' advice.

Given the outlined context, the community pharmacists might play a paramount role by intercepting patients with GI symptoms more quickly than physicians: they will probably rely either on prescription and non-prescription medicines or on the advice from pharmacists on some possible natural healthcare product.

Recent therapeutic approaches demonstrated the importance of a proper patient education carried out by physicians and pharmacists (Ness-Jensen et al. 2016; Savarino et al. 2017), especially with regards to the correct use of medicines and other healthcare products [e.g., from antacids and alginates to proton pump inhibitors (PPIs), prokinetic agents, and natural products]. The role of community pharmacists is indeed strategic in counseling patients on the correct usage of non-prescription medicinal products (Inadomi and Fendrick 2005; WHO 2011; Boardman and Heeley 2015), in order to avoid the side effects due to uncontrolled, long-term use as well as drug-drug interactions.

At this point, it is paramount noting that standardized "triage" procedures for community pharmacists to support patients affected by dyspepsia or reflux symptoms are scarce in most European countries. This is also due to the lack of updated pharmacoepidemiologic data on patients. As an example, in Italy, specific guidelines are missing mainly due to a lack of real-world data on the prevalence of upper GI disorders in patients visiting the community pharmacy and on their self-management habits. To the best of our knowledge, this work is the first descriptive study that aims at exploring the medication history of patients suffering from upper GI symptoms attending community pharmacies, assuming both prescription and over-the-counter (OTC) medicinal products. A Belgian study with a similar design, published in 2009 (Mehuys et al. 2009), aimed essentially at investigating the role of community pharmacists in self-medication of upper GI symptoms, focusing on OTC medicinal products.

The study was designed as a descriptive, cross-sectional study to explore the medication history of patients with upper GI symptoms visiting the community pharmacy and taking prescription and non-prescription medicines. In particular, the study aimed at exploring the patient's medical history, assessing the prevalence of the main upper GI symptoms, and the therapeutic classes most used in their treatment, as well as the percentage of patients seeking medical advice or taking non-prescription drugs. Secondary outcomes were the duration of the therapy and the frequency of symptoms reappearance after therapy discontinuation for each therapeutic class.

Experimental part

Study design

This cross-sectional study was conducted for 7 months in 20 community pharmacies across Italy (7 in the North, 7 in the Center, and 6 in the South and Islands) by 20 pharmacists collectively named "SIFAC Group of Community Pharmacists" (SGCP). As described in previous work (Giua Marassi et al. 2018), data were gathered exclusively using an ad hoc paper questionnaire with closed and open questions (available in the Supplemental Information). The questionnaire was developed through a structured consensus process by community pharmacists and researchers with expertise in clinical pharmacology, medicine, gastroenterology, biomedical engineering. It was administered to patients by the trained pharmacists adhering to the SGCP. Each of the 20 community pharmacies conducted the survey for two days each month, for seven months, and for a total of 280 survey days, which have been carefully selected, by ensuring that every working day of each month would have been covered. The questionnaire was administered to at least two eligible patients, the first two

ones that fitted the requirements, for a total of 1,020 interviewed patients. Eligible patients were 18-year-old or older adults visiting the community pharmacy, who had suffered at least once in the preceding three months from upper GI disorders, involving at least one of the most common symptoms (acid regurgitation, burning sensation in the throat, heartburn, chronic cough, epigastric burning, epigastric pain, upper abdominal bloating, postprandial fullness, and nausea). The questionnaire, completed by the pharmacist in 10–15 minutes, focused on the most irritating symptom. After completion, the information was anonymously entered into a standardized web-based platform and re-coded in a Microsoft Excel 2007 file (Microsoft, USA). Drugs and natural products used for treating symptoms were classified based on their therapeutic indications into 8 classes: proton pump inhibitors (ATC code: A02BC), antacids (A02A), alginates (A02BX), H2-receptor antagonists (A02BA), prokinetic agents [including propulsive agents (A03F) and benzamides (N05AL)], mucopolysaccharides (which are available in Italy as medical devices class IIA), herbal supplements and others. All the medicinal products listed – except for benzamides which are prescription-only – are available in Italy as both prescription and non-prescription drugs. The sample size was chosen to ensure enough power for the detection of statistically significant results for the primary outcome.

The study has been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. The study protocol has been reviewed and approved by the Ethical Review Board of SIFAC (Società Italiana di Farmacia Clinica). The interviews have been pursued within the community pharmacy setting. All patients gave their oral consent before such interviews.

Statistical analyses

Mean, standard deviation (SD), and range were used as descriptive statistics for scalar variables, while absolute and relative frequencies were used for reporting discrete data. The relationships between treatment/symptom characteristics and pharmacological class were evaluated using Pearson's chi-squared test, and the log-linear models were used for comparing observed versus expected cell frequencies. The polynomial contrast was applied in the log-linear models to test the trend behavior for ordinal variables. The data were fully managed and analyzed by using the IBM SPSS Statistics package v. 23 (IBM, USA). Differences were considered significant at the $p < 0.05$ level.

Results

Characteristics of the sample population

Out of 1,064 patients who have been intercepted in the pharmacy for upper GI disorders, a total of 1,020 patients, accepted to take part in the research. More specifically, 550 patients (53.9%) were females, and the mean age was 50.2 ± 16.9 years (range 18–100 years). The body mass index (BMI = weight/height^2) was stratified according to the NIH criteria (NHLBI 2016) and revealed that 277 patients (27.2%) were overweight and 88 (8.6%) were obese. Furthermore, subjects (n = 706, 69.2%) were mostly non-smokers. Table 1 displays further characteristics of the sample population.

Table 1. Characteristics of the studied population of patients.

Characteristics	No. of patients (n=1,020)
Gender:	
– Female	550 (53.9%)
– Male	470 (46.1%)
Age-range (years):	
Mean±SD (range)	50.2±16.9 (18–100)
– 18–25	65 (6.4%)
– 26–35	170 (16.7%)
– 36–49	264 (25.9%)
– 50–65	318 (31.2%)
– More than 65	203 (19.9%)
Body mass index (BMI):	
– Underweight (<18.5 kg/m^2)	18 (1.8%)
– Normalweight (18.5–24.9 kg/m^2)	637 (62.5%)
– Overweight (25.0–29.9 kg/m^2)	277 (27.2%)
– Obese (30.0 kg/m^2 and above)	88 (8.6%)
Daily cigarette consumption:	
– Non smokers	706 (69.2%)
– Less than 10	173 (17.0%)
– 10–20	105 (10.3%)
– More than 20	36 (3.5%)
Alcohol consumption:	
– Never	412 (40.4%)
– Rarely (<1–3 times/month)	417 (40.9%)
– Yes (during meals only)	168 (16.5%)
– Often (>1–2 times/week)	23 (2.3%)
Main gastrointestinal symptom reported	
– Epigastric burning	324 (31.8%)
– Acid regurgitation	149 (14.6%)
– Postprandial fullness	122 (12.0%)
– Burning sensation in the throat	106 (10.4%)
– Upper abdominal bloating	100 (9.8%)
– Heartburn	76 (7.5%)
– Epigastric pain	71 (7.0%)
– Chronic cough	37 (3.6%)
– Nausea	35 (3.4%)
Frequency of the main gastrointestinal symptom reported	
– Once per month	121 (11.9%)
– 2 or 3 times per month	216 (21.2%)
– Once per week	190 (18.6%)
– 2 or 3 times per week	272 (26.7%)
– 4 or more times per week	221 (21.7%)

Prevalence of GI symptoms

The most commonly self-reported upper GI symptoms were epigastric burning, 31.8% (n = 324); acid regurgitation, 14.6% (n = 149); and post-prandial fullness, 12.0% (n = 122). For further details on additional symptoms, see Table 1.

On average, the frequency of reoccurrence of the main symptom was two or three times per month in 216 subjects (21.2%), two or three times per week in 272 subjects (26.7%), and four or more times per week in 221 subjects (21.7%) (Table 1). By comparing the frequency of each

Table 2. Frequency of the gastrointestinal symptoms reported by the 1,020 interviewed subjects.

Gastrointestinal symptoms	Frequency of symptoms					P-value (+/-)[1]
	Once per month	2–3 times per month	Once per week	2–3 times per week	4 or more times per week	
Epigastric burning	47 (14.5%)	76 (23.5%)	70 (21.6%)	86 (26.5%)	45 (13.9%)	<0.001 (-)
Acid regurgitation	10 (6.7%)	22 (14.8%)	21 (14.1%)	56 (37.6%)	40 (26.8%)	0.025 (+)
Postprandial fullness	11 (9.0%)	33 (27.0%)	27 (22.1%)	33 (27.0%)	18 (14.8%)	0.175 (-)
Burning sensation in the throat	12 (11.3%)	30 (28.3%)	20 (18.9%)	22 (20.8%)	22 (20.8%)	0.131 (-)
Upper abdominal bloating	18 (18.0%)	15 (15.0%)	18 (18.0%)	17 (17.0%)	32 (32.0%)	0.274 (-)
Heartburn	8 (10.5%)	13 (17.1%)	12 (15.8%)	24 (31.6%)	19 (25.0%)	0.758 (+)
Epigastric pain	9 (12.7%)	20 (28.2%)	10 (14.1%)	18 (25.4%)	14 (19.7%)	0.143 (-)
Chronic cough	1 (2.7%)	3 (8.1%)	5 (13.5%)	8 (21.6%)	20 (54.1%)	0.011 (+)
Nausea	5 (14.3%)	4 (11.4%)	7 (20.0%)	8 (22.9%)	11 (31.4%)	0.916 (+)
Overall	121 (11.9%)	216 (21.2%)	190 (18.6%)	272 (26.7%)	221 (21.7%)	-

[1] Comparison between the frequency of each symptom versus the expected frequencies (Log-linear model with polynomial contrast). (+) Frequency of symptoms higher than the expected one. (-) Frequency of symptom lower than the expected one.

symptom versus the expected frequency, acid regurgitation showed a statistically significant higher frequency, while epigastric burning showed a statistically significant lower one (Table 2). The frequency of acid regurgitation and chronic cough was at least two or three times a week for 96 (64.4%) and 28 (75.7%) patients, respectively, while the frequency of epigastric burning was once per week or less for 193 patients (59.6%) (Table 2).

Mostly used medicines

At the time of the survey, a total of 633 (62.1%) of the interviewed patients had previously consulted a physician for the management of the symptoms. Nonetheless, a significant time gap between the onset of symptoms and medical consultation was reported by 89.6% of the subjects (n = 567): 56.1% of them (n = 318) sought medical advice within 15 days of the onset of symptoms; 17.1% (n = 97) between 15 days and one month; 21.3% (n = 121) between one and six months, and the remaining 5.5% (n = 31) after six months or more.

Focusing on the pharmacological treatments, 1,018 patients had taken between 1 to 3 different drugs (mean 1.58 treatments per patient) for upper GI symptoms: 1 medicine for 518 (50.9%) patients, 2 medicines for 409 (40.2%) patients and 3 medicines for 91 (8.9%) patients, for a total of 1,609 treatments. The most common therapeutic class used was PPIs (n = 572 treatments, 35.6%), followed by antacids (n = 281, 17.5%) and alginates (n = 276, 17.2%) (Table 3). Prescription medicinal products consisted in more than one-half of all pharmacological treatments taken by patients (n = 845, 52.5%). Indeed, they represented the 90.6% (n = 518) of the 572 PPIs; 80.2% (n = 93) of the 116 prokinetic agents; 57.7% (n = 30) of the 52 H2-receptor inhibitors, 49.3% (n = 136) of the 276 alginates; 22.0% (n = 62) of the 281 antacids (Figure 1).

However, it should be noted that a physician may prescribe even non-prescription medicinal products. Indeed, of the total 1,609 treatments, only 391 (24.3%) were recommended by a pharmacist, and 284 (17.7%) have been chosen by patients in self-medication regimen (Table 3). Thus, 42.0% of the treatments had no medical prescription.

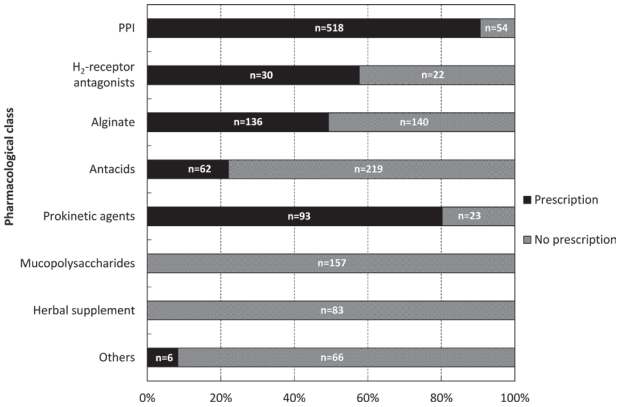

Figure 1. Need for prescription of the pharmacological class of medicines selected for the 1,609 treatments reported by the 1,020 interviewed subjects.

PPIs were prescribed by GPs in 323 cases (56.5%; P<0.001), by the medical specialist in 183 cases (32.0%; P<0.001) and were recommended by the pharmacist in 33 cases (5.8%; P < 0.001). They were generally used to treat epigastric burning in 155 cases (27.1%; P = 0.800), acid regurgitation in 108 cases (18.9%; P = 0.016), and heartburn in 61 cases (10.7%; P = 0.003).

Products based on alginate were prescribed by the GP in 110 cases (39.9%; P = 0.067), by the medical specialist in 67 cases (24.3%; P < 0.001) and were recommended by the pharmacist in 57 cases (20.7%; P<0.001). Alginates were used mainly to control the epigastric burning (n = 86, 31.2%; P = 0.009), and acid regurgitation (n = 60, 21.7%; P < 0.001). Antacids were chosen without a medical prescription in 186 cases (66.2%; P<0.001) to control mainly the epigastric burning (n = 117, 41.6%; P < 0.001). The pharmacist recommended mucopolysaccharides in 138 cases (87.9%; P < 0.001) and herbal treatments in 58 cases (69.9%; P < 0.001) (Table 3). Mucopolysaccharides were used for the management of epigastric burning in 72 cases (45.9%; P < 0.001) and for burning sensation in the throat in 20 cases (12.7%; P = 0.036) (Table 3).

The duration of the therapy with PPIs was significantly longer than the one of the other therapies, lasting from more than one month to six months in 218 cases (40.4%; P < 0.001) and over six months in 101 cases

Table 3. Summary of the 1,609 treatments reported by the 1,020 interviewed subjects.

Characteristics	PPI§ (n = 572, 35.6%)	H_2 blockers (n = 52, 3.2%)	Alginate (n = 276, 17.2%)	Antacids (n = 281, 17.5%)	Prokinetic agents (n = 116, 7.2%)	MP‡ (n = 157, 9.8%)	Herbal supplement (n = 83, 5.2%)	Others (n = 72, 4.5%)	Total (n = 1,609)
A) Treatment recommendation (P<0.001*)									
- Self-medication	33 (5.8%) [c]	10 (19.2%)	42 (15.2%) [b]	138 (49.1%) [c]	16 (13.8%)	11 (7.0%)	20 (24.1%) [b]	14 (19.4%)	284 (17.7%)
- Pharmacist	33 (5.8%) [c]	13 (25.0%)	57 (20.7%) [c]	48 (17.1%) [c]	12 (10.3%) [c]	138 (87.9%) [c]	58 (69.9%) [c]	32 (44.4%)	391 (24.3%)
- General practitioner	323 (56.5%) [c]	17 (32.7%)	110 (39.9%)	76 (27.0%)	59 (50.9%) [c]	6 (3.8%) [b]	5 (6.0%)	19 (26.4%)	615 (38.2%)
- Medical specialist	183 (32.0%) [c]	12 (23.1%) [a]	67 (24.3%) [c]	19 (6.8%)	29 (25.0%) [c]	2 (1.3%) [a]	0 [a]	7 (9.7%)	319 (19.8%)
B) Symptoms (P<0.001*)									
- Epigastric burning	155 (27.1%)	18 (34.6%)	86 (31.2%) [b]	117 (41.6%) [c]	16 (13.8%) [a]	72 (45.9%) [c]	11 (13.3%)	5 (6.9%) [c]	480 (29.8%)
- Acid regurgitation	108 (18.9%) [a]	7 (13.5%)	60 (21.7%) [c]	43 (15.3%)	11 (9.5%)	18 (11.5%)	5 (6.0%)	4 (5.6%) [a]	256 (15.9%)
- Postprandial fullness	43 (7.5%) [c]	6 (11.5%)	13 (4.7%) [c]	30 (10.7%)	44 (37.9%) [c]	11 (7.0%)	19 (22.9%) [c]	12 (16.7%)	178 (11.1%)
- Burning sensation in the throat	72 (12.6%)	5 (9.6%)	40 (14.5%) [c]	26 (9.3%)	5 (4.3%)	20 (12.7%) [a]	3 (3.6%)	3 (4.2%)	174 (10.8%)
- Upper abdominal bloating	52 (9.1%)	3 (5.8%)	20 (7.2%)	23 (8.2%)	7 (6.0%)	9 (5.7%)	38 (45.8%) [c]	20 (27.8%) [c]	172 (10.7%)
- Hearthburn	61 (10.7%) [b]	6 (11.5%)	32 (11.6%) [c]	14 (5.0%)	3 (2.6%)	7 (4.5%)	1 (1.2%)	2 (2.8%)	126 (7.8%)
- Epigastric pain	46 (8.0%)	3 (5.8%)	4 (1.4%) [b]	16 (5.7%)	5 (4.3%)	12 (7.6%)	3 (3.6%)	12 (16.7%) [b]	101 (6.3%)
- Cronic cough	19 (3.3%) [a]	4 (7.7%)	18 (6.5%)	4 (1.4%) [b]	7 (6.0%)	5 (3.2%)	3 (3.6%)	9 (12.5%) [a]	69 (4.3%)
- Nausea	16 (2.8%)	0	3 (1.1%)	8 (2.8%)	18 (15.5%) [c]	3 (1.9%)	0	5 (6.9%) [a]	53 (3.3%)
C) Duration of therapy (P<0.001*)									
- When the need arises	32 (5.9%) [c]	14 (28.6%)	106 (43.4%)	212 (80.6%) [c]	45 (42.1%)	107 (72.3%) [c]	25 (32.5%)	18 (26.9%)	559 (37.4%)
- Until 2 weeks	97 (18.0%) [c]	13 (26.5%)	46 (18.9%)	22 (8.4%)	23 (21.5%)	19 (12.8%)	27 (35.1%) [a]	32 (47.8%) [b]	279 (18.7%)
- From more than 2 weeks to 1 month	82 (15.2%) [c]	1 (2.0%)	26 (10.7%)	6 (2.3%)	13 (12.1%)	7 (4.7%)	2 (2.6%)	3 (4.5%)	140 (9.4%)
- From more than 1 month to 6 months	218 (40.4%) [c]	14 (28.6%)	45 (18.4%)	19 (7.2%)	19 (17.8%)	10 (6.8%) [b]	22 (28.6%) [a]	13 (19.4%)	360 (24.1%)
- More than 6 months	101 (18.7%) [c]	6 (12.2%)	19 (7.8%)	4 (1.5%)	5 (4.7%)	4 (2.7%)	1 (1.3%)	1 (1.5%)	141 (9.4%)
- Cyclical	9 (1.7%)	1 (2.0%)	2 (0.8%)	0	2 (1.9%)	1 (0.7%)	0	0	15 (1.0%)
- Not reported#	n = 33 (5.8%)	n = 3 (5.8%)	n = 32 (11.6%)	n = 18 (6.4%)	n = 9 (7.8%)	n = 9 (5.7%)	n = 6 (7.2%)	n = 5 (6.9%)	n = 115 (7.1%)
D) Reappearance of symptoms (P<0.001*†)									
- Yes	229 (40.2%)	22 (43.1%)	112 (43.8%) [a]	147 (54.9%) [b]	49 (44.5%)	43 (28.3%) [a]	21 (30.0%) [b]	19 (27.9%)	642 (41.6%)
- No	116 (20.4%)	8 (15.7%)	46 (18.0%) [a]	58 (21.6%) [b]	29 (26.4%)	42 (27.6%) [a]	27 (38.6%) [b]	20 (29.4%)	346 (22.4%)
- Ongoing therapy	224 (39.4%)	21 (41.2%)	98 (38.3%)	63 (23.5%) [c]	32 (29.1%)	67 (44.1%) [a]	22 (31.4%)	29 (42.6%)	556 (36.0%)
- Not reported#	n = 3 (0.5%)	n = 1 (1.9%)	n = 20 (7.2%)	n = 13 (4.6%)	n = 6 (5.2%)	n = 5 (3.2%)	n = 13 (15.7%)	n = 4 (5.6%)	n = 65 (4.0%)

Percentages of valid cases are reported in the Table.

* P-values show significant differences found among the pharmacological classes (Pearson's chi-squared test); † P-value among the 3 categories.

§ Proton pump inhibitors; ‡ Mucopolysaccharides; # These subjects were excluded from the analysis

a P<0.05; b P<0.01; c P<0.001 versus the expected frequencies (log-linear model).

(18.7%; P < 0.001). Antacids and mucopolysaccharides were only used when needed in 212 cases (80.6%; P < 0.001) and 107 cases (72.3%; P < 0.001), respectively (Table 3). However, symptoms reappeared at the end of the therapy in 147 treatments with antacids (54.9%; P = 0.004), in 112 treatments with alginates (43.8%; P = 0.017), and 43 treatments with mucopolysaccharides (28.3%; P = 0.034) (Table 3).

Discussion

This study provides real-world evidence data about the medication history of 1,020 individuals suffering from upper GI symptoms visiting a community pharmacy, and represents one of the most significant studies, in terms of sample size, performed in the Italian or European community pharmacies in this fild (Mehuys et al. 2009; Urru et al. 2015; Pasina et al. 2015, 2016; Giua Marassi et al. 2018; Brusa et al. 2019). The results highlight that it is feasible to collect information on the therapeutic history of patients attending community pharmacies, providing a cross-sectional view of the way they manage their disorders. This mentioned source of data results to be paramount especially if taking into account the lack of information related to self-medication practices with respect to GI disorders.

According to the results, two-thirds (67%) of the enrolled patients reported a frequency of symptoms higher than 1 episode per week (Table 2), thereby suggesting that GI symptoms are not acute in most of the cases. Secondly, the majority (60–70%) of patients with heartburn and regurgitation had occasional symptoms for which they did not seek any medical advice, often trying to manage their symptoms with non-prescription medications, forming the submerged part of the so-called "GERD iceberg" described by Kitchin and Castell (1991). The observed results (Table 1) were consistent with data previously obtained in other EU countries (Mehuys et al. 2009). As regards the reappearance of symptoms after discontinuation of the treatment, this study was not designed to establish treatment efficacy; rather, the present study provides hints on how patients perceive the efficacy of their therapy. During the interview, more than one-third of treatments were still in progress, and 642 subjects out of 986 (65%) declared that the symptoms reappeared at the end of the therapy.

As far as the most used therapeutics is concerned, results showed that the most common was PPIs (35.6%) (Ta-

ble 3). PPIs are indeed prescribed by physicians in more than 90% of the cases and recommended by pharmacists or requested by patients in the remaining 10%. PPIs are recommended as the treatment of choice for major upper GI diseases or gastroesophageal syndromes (Talley and Vakil 2005; Katz et al. 2013; Moayyedi et al. 2017). Antacids were the therapeutic class most frequently requested by patients (219 treatments on a total of 764) to be taken as needed, in case of less severe forms. Indeed, antacids are known to be frequently used in less-severe forms of upper GI disorders and short-term symptom relief (GERD 2016; NICE 2020). Furthermore, mucopolysaccharides were the class most recommended by pharmacists (88%). In addition to the above, it should be also noted that 49.1% of the subjects used more than one treatment. Unlike previous evidence (Giua Marassi et al. 2018), data on patients' history do not highlight critical issues in the therapeutic appropriateness of the treatments prescribed or recommended to the patients. Based on the patients' symptoms, the usage of non-prescription products (e.g., antacids and alginates) was in line with the main clinical guidelines and with their Summary of Product Characteristics (Hunt et al. 2014). Mucopolysaccharides are the most used for the treatment of epigastric burning among the study subjects, although only a few clinical findings are available in the literature (NIH 2019). Despite the popularity of natural and herbal products, their use is often based on transitional behavior and not on precise data on the clinical evidence (Centro Studi Assosalute 2016); moreover, their safety profiles are not fully characterized, if taken together with other pharmacological treatments.

Our study showed that more than one-third of eligible patients (37.9%) did not seek medical advice and about 42% of all medicines were assumed by patients based on self-medication (17.7%) or following pharmacists' advice (24.4%). These trends agree with data available in the literature (Major and Vincze 2010; Lebanova et al. 2020). In this context, it is worth noting that patients often underestimate the risk associated with over-the-counter medications or have a tendency to use them for too long (Yla-Rautio et al. 2020). Given the unexpected side effects of drug interactions, the possibility that the physician may not be aware of the full patient's history exposes patients to risk. Therefore, the role of the community pharmacists in the management and triage of patients with upper GI disorders, and in detecting the side effects of OTC medicinal products and herbal products is clear (Layton et al. 2002; Arabyat et al. 2020; NICE 2020; Yla-Rautio et al. 2020). Due to their direct contact with patients, community pharmacists are in a strategic position, which allows them to: (i) monitor therapeutic choices, proper use of medicines, adherence to the therapies, adverse effects; (ii) prevent increased risk for patients' health due to unwanted side effects related to the uncontrolled and long-term usage of OTC medicinal products.

The monitoring of real-world usage of OTC medicinal products by community pharmacists would be useful to set up appropriate guidelines on the management and triage of patients suffering from upper GI symptoms, to improve pharmacovigilance, and the establishment of proper counseling on such medicinal products. Considering that patients expect high-quality counseling on self-medication (Seiberth et al. 2021; Veiga et al. 2021), the use of evidence-based tools for supporting pharmacists is widely recognized as a key point for improving self-medication care (Moritz et al. 2019, 2021a, b). At the international level, there are many examples of tools accessible to pharmacists (i.e., algorithms or symptom assessment questionnaires) for these disorders (New Zealand Guidelines Group 2003; Aradottir and Kinnear 2008; Holtmann et al. 2011; Tack et al. 2014; Showande and Adelakun 2019). However, due to the peculiar patients' attitudes and preferences, they may not be fully applicable to all national contexts. The results of this study provide insights to design evidence-based medicine practice tools (including training) determined from the real needs of patients visiting Italian community pharmacies (Giua Marassi et al. 2015). The limitations of this study lie in an unclear clinical diagnosis and unconfirmed medical history, as all the symptoms were self-reported without any confirmation from a physician, and Italian community pharmacists cannot access patients' medical records. Although the study allowed to investigate the duration of therapies, no conclusion could be made about adherence, since information about the prescribed duration of treatment was lacking.

Conclusion

In conclusion, this work represents, to the best of our knowledge, the first descriptive study conducted in the Italian community pharmacy setting, aiming at exploring the history of patients with upper GI symptoms, assessing their prevalence, and the pharmacological treatments used to manage them. The study's findings confirmed the importance of the role of community pharmacists in supporting patients since about 40% of them had not seen a physician before entering the pharmacy. Data obtained from the present study may be a reliable support for the development of guidelines addressed to community pharmacists, fostering an evidence-based approach to the management of patients suffering from upper GI symptoms. Training and standardization of the pharmacist's approach to professional advice may improve patients' compliance and quality of life, as well as the pharmacovigilance of non-prescription medicines.

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Supplementary material 1

A Questionnaire of Upper Gastrointestinal Symptoms: Clinical Study

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Data type: Personal details of patients

Link: https://doi.org/10.3897/PlantSociology.68.66065.suppl1