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# Use of prescribed and non-prescribed medication for dyspepsia

Nicole Krol<sup>1</sup>, Jean W.M. Muris<sup>2</sup>, Geert Schattenberg<sup>1</sup>, Richard Grol<sup>1</sup> and Michel Wensing<sup>1</sup>

<sup>1</sup>Centre for Quality of Care Research, University Medical Centre St Radboud, Nijmegen, <sup>2</sup>Maastricht University, Research Institute CAPHRI, Dept. General Practice, The Netherlands.

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**Objective** – To explore patient factors related to the use of prescribed and non-prescribed drugs for dyspepsia in The Netherlands.

**Design** – Patient survey study.

**Setting and subjects** – Questionnaires sent to patients who had a prescription for dyspepsia medication from their general practitioner.

**Main outcome measures** – Patient factors related to the on-demand use of prescribed medication and the use of non-prescribed medication for dyspepsia.

**Results** – 74% of the (n = 518) patients had been receiving prescribed medication for dyspepsia for more than one year. A quarter of the patients were using the prescribed medication “on demand” instead of adhering to the instructions on the prescription. PPI prescriptions reduced the probability of using the medication on demand, compared with other prescribed drugs (OR 0.39). Some 19% of the patients were using non-prescribed drugs for dyspepsia. More of the patients who

had visited their general practitioner in the previous 12 months were using their drugs on demand (OR 2.27) and were using non-prescribed drugs (OR 2.40) than the patients who had not visited their GP.

**Conclusion** – Clear information for patients on how to use their medication for dyspepsia may contribute to decreasing unnecessary drug use. Communication about (in)appropriate use of drugs “on demand”, non-prescribed drugs, and health education should be addressed to all patient groups. Further studies on these topics should aim to improve medical care based on shared decision-making for patients with dyspepsia.

**Key words:** medication use, dyspepsia, general practice, patient survey study.

Nicole Krol, Centre for Quality of Care Research (WOK), UMC St Radboud, PO Box 9101, 6500 HB Nijmegen, The Netherlands. E-mail: N.Krol@wok.umcn.nl

Most patients who seek advice for dyspeptic symptoms from a GP receive a drug prescription (1,2), usually for acid-suppressive drugs. Over the past 10 years, the cost of acid-suppressive medication has increased by 60%, mainly due to an increase in PPI (proton pump inhibitor) prescriptions (3–5). Compliance with treatment is crucial for achieving clinical benefit but patients with dyspepsia do not always use the medication according to instructions (6,7). It is important to understand patterns of dyspepsia medication use, because these are likely to influence clinical effectiveness as well as cost on a societal level. This study explored factors underlying the use of dyspepsia medication in patients who had recently received a prescription.

Inadequate use of prescribed drugs and the use of non-prescribed drugs for dyspepsia are two different aspects of medication behaviour by patients. Using drugs “on demand” refers to a patient’s decision to take the drugs according to the perceived need and is an expression of non-adherence to treatment. Although the use of acid-suppressive drugs “on demand” has been recommended (8,9), previous and recent Dutch clinical guidelines for general practice do not recommend this because of incomplete evidence (10,11). The clinical impact of non-prescribed drug use for dyspepsia is unclear (12,13) but is a potential

competitor for prescribed medication. Severity of symptoms is probably related to use “on demand” (8) or to the use of non-prescribed drugs. In most consultations, the use of prescribed medication is not discussed explicitly (14) and GPs rarely discuss patients’ use of non-prescribed medication (15,16). Greater insight is needed into associations between patient medication behaviour and characteristics of consultations and patient characteristics.

An observational study was performed to gain insight into patient factors associated with the on-

Patients with dyspepsia do not always use their medication according to instructions. It is important to understand patterns of medication use, because of clinical effectiveness as well as cost.

- A quarter of all patients used their prescribed medication on demand; when using PPIs the probability of on-demand use decreased.
- Consultation with the GP in the past 12 months was associated with on-demand use and with use of over-the-counter medication.

demand use of prescribed medication and the use of non-prescribed medication.

## MATERIAL AND METHODS

An observational study was performed, based on questionnaire surveys among patients. The local research ethics committee approved the research protocol.

### Subjects

Ten general practitioners (GPs) from two districts in The Netherlands selected all patients who had received a prescription for one of five categories of dyspepsia drugs (antacids, prokinetics, mucosa-protectives, h2 receptor antagonists (h2RAs), and proton pump inhibitors (PPIs) recommended by the Dutch Formulary (17). Exclusion criteria were age under 18 years, not being able to fill in the questionnaire, and serious disease. GPs used an electronic medical record system to select recent prescriptions by using A(natomical) T(herapeutic) C(lassification) codes, or they identified medication from the complete electronic list of drugs that belong to the five categories according to the Formulary. A total of 803 patients were selected and approached.

### Variables

A written questionnaire was developed to measure the following dependent variables: (a) the use of prescribed medication, measured by questions on the frequency of use of this medication (6 answer categories: daily, never, and four modifications of "sometimes"). Use "on demand" was defined as using the prescribed drug according to one of the four modifications of "sometimes" for example "some weeks on and off" or "several times a week"; (b) the use of non-prescribed drugs for dyspepsia, measured by questions on non-prescribed medication for dyspepsia purchased in the previous four weeks. The following options were suggested: h2RAs, antacids, and other non-prescribed medication for dyspepsia.

Independent variables included: (a) patient's age, sex, and education level (7 categories), measured with single questions; (b) date of first GP visit for dyspepsia symptoms (6 weeks ago, 3 or 6 months ago, or more than a year ago); (c) number of GP visits in the previous 12 months (from zero to 6, or more than 6 times using 8 categories); (d) prescribed medication (patients were asked to look at their prescriptions when filling in the questionnaire and tick the relevant medication on a list of all available drugs according to the formulary for dyspepsia); (e) duration of drug use (period of 6 weeks, 3 to 6 months, or a year or more); (f) continuous use of the drug: "did you use these

drugs all the time since the first prescription without long periods of no usage" (yes or no); (g) co-medication use e.g. analgesics, sedatives or hypnotics (a list of the most commonly prescribed drugs which could be ticked); (h) perceived causes for changes in complaints (medication use, diet, personal circumstances, and changes in alcohol or tobacco use, or no idea); two validated instruments were used to measure patients' health status; (i) dyspepsia severity (standard instrument) (18); (j) mental health and vitality (standard instrument) (19).

### Procedure

Questionnaires were sent to the patients at home. Patients were asked to fill in and return the questionnaire after giving informed consent. Reminders were sent to non-responders after 3 weeks. For a non-response analysis, information (age, sex, and duration of medication use) was collected from the electronic medical record systems on a sample of non-responders (12%).

### Analyses

Bivariate analyses, multivariate analyses, and logistic regression with significant variables were used to determine associations. The two dependent variables in the logistic regression analyses were use "on demand" of prescribed medication and use of non-prescribed medication for dyspepsia. Associations with all independent variables were examined, except for possible causes for change in which only the category "medication as a cause" was included in the analyses. For multivariate analyses, all related independent variables were included in logistic regression analyses.

## RESULTS

A total of 518 patients completed the questionnaire (64.5%). Table I shows that the mean age was 58.6 years and that 61% were 55 years or older. Slightly more than half of the sample (56%) were women. The majority of patients (78%) had first visited their GP for dyspepsia more than a year ago. In the previous 12 months, 22% had visited their GP more than twice. Symptoms of upper abdominal pain, abdominal discomfort, heartburn, or acid regurgitation were present in 93% of the patients. About half (47%) of the patients reported severe symptoms.

There were no significant differences in age or sex between non-responders and responders (non-responders mean age 57.42, 53% women), but fewer non-responders had received drug prescriptions for more than one year (OR 1.234).

Table I. Patient characteristics (n = 518).

Age >55 years	317 (61%)
Women	284 (56%)
Education level:	
Low	252 (51%)
Medium	159 (32%)
High	88 (17%)
First visit >12 months ago	373 (78%)
Last visit >12 months ago	196 (38%)
Number of visits previous 12 months:	
0	196 (38%)
1 or 2	222 (43%)
3–6	92 (18%)
Dyspepsia severity:	
Low	38 (7%)
Medium	236 (46%)
High	244 (47%)
Prescriptions:	
Antacids/prokinetics	72 (14%)
H2ra	85 (16%)
PPI	309 (60%)
Continued use of medication:	
Use of analgesics	273 (61%)
Use of sedatives/hypnotics	70 (14%)
Medication as cause of change	83 (16%)
Self-reported mental health (mean)	21.8
Self-reported vitality (mean)	15.1

Absolute numbers, percentages in parentheses unless otherwise mentioned.

*Use of prescribed medication*

More than half of the patients had prescriptions for PPIs (60%). The majority (74%) had been using the medication for more than one year; 64% reported daily use of the prescribed medication. A quarter (25%) of the patients were using the medication “on demand” (Table II). More of the patients who had visited their GP once or twice in the past 12 months were using their drugs on demand (33%) than patients who had not visited their GP (OR 2.27 (Table III)). Furthermore, the probability of using PPIs on demand was smaller than that of other prescribed drugs (OR 0.39).

Table II. Use of prescribed and non-prescribed medication (n = 518).

Prescribed medication:	
Used daily	383 (74%)
Used “on demand”	122 (25%)
Never used	6 (1%)
Drug use >one year	383 (74%)
Use of non-prescribed drugs for dyspepsia	101 (19%)
Use of non-prescribed h2RA	21 (4%)
Use of non-prescribed antacids	76 (15%)

Absolute numbers, percentages in parentheses.

Table III. Predictors of prescribed medication use “on demand” and use of non-prescribed drugs (n = 518).

Predictor	On demand	Non-prescribed drugs
High dyspepsia severity		0.39 {0.20;0.75}*
No of visits in previous 12 months:		
1 or 2	2.27 {1.40;3.66}*	
3 to 6		2.40 {1.31;4.40}*
Continuous medication use	0.07 {0.04;0.12}*	0.60 {0.38;0.96}*
Antacid or prokinetic prescription	1.71 {1.00;2.93}*	
PPI prescription	0.39 {0.26;0.58}*	
Relatively poor mental health		1.79 {1.11;2.86}*
Last visit >12 months ago	0.52 {0.33;0.81}*	

Logistic regression analysis OR (95% CI).

\* = significant.

Non-prescribed drugs for dyspepsia were being used by 19% of the patients (Table III). Patients who reported more severe dyspepsia symptoms were using fewer non-prescribed drugs (OR 0.39). More of the patients who had visited their GP 3 to 6 times in the previous 12 months were using non-prescribed drugs than patients who had not visited their GP at all in the previous 12 months (OR 2.40). Lower education level was associated with more usage of non-prescribed drugs than higher education levels (22% versus 15%), but the difference was not significant.

A total of 61% of the patients were using their prescribed medication continuously. This continuous use of prescribed medication meant that there was a lower probability of non-prescribed drug use (OR 0.06). Patients with a higher score on the mental health scale (i.e. feeling better) reported less use of non-prescribed drugs (OR 0.56).

DISCUSSION

This study on patients who had been prescribed dyspepsia medication by their GP showed that a quarter of them were using the drugs on demand, although the national clinical guidelines advise continuous use of the prescribed drugs. Almost a fifth of the patients were using non-prescribed dyspepsia medication, mainly antacids. Use of prescribed medication “on demand” appeared to be more prevalent in patients who had received antacids or prokinetics than in patients who had received proton pump inhibitors. The use of non-prescribed drugs was associated with less severe dyspepsia symptoms, intermittent use of the prescribed medication, and poorer mental health. In addition, a higher number of visits to the GP appeared

to be associated with both use on demand and use of non-prescribed drugs.

Shaw also found an association between the use of non-prescribed h2RAs and a higher number of visits to the GP (20). In the past decade, the use of non-prescribed drugs has become more common, because many drugs have been introduced onto the over the counter (OTC) market. In The Netherlands, h2RAs and antacids can be bought at the supermarket, although the dose of h2RAs is half that of the lowest prescription dose. TV commercials and other marketing strategies are used to promote this type of self-medication. GPs' attitudes towards the use of non-prescribed drugs for dyspepsia vary from ignorance to recommendation (16,21). Self-reports by patients on the effectiveness of chronic non-prescribed histamine-2 receptor antagonist use showed that they rarely relieve symptoms (20). Opposing views exist as to whether it is an advantage that patients with dyspepsia use non-prescribed drugs (12,13,22).

Our study did not show an association between symptom severity or absence of symptoms and use on demand. However, previous research into long-term PPI use has shown that use on demand was related to symptom severity and the presence or absence of symptoms (8). An explanation for these inconsistent findings can be found in differences between study populations and the method of measuring the severity of symptoms.

Discussion continues as to whether or not to encourage use on demand, especially with regard to PPIs (7). For a minority of patients with dyspepsia (patients with GORD) the intermittent or on-demand use of PPIs has been discussed by the Genval Workshop (23), which concluded that for endoscopically negative patients on-demand therapy in long-term management could be included. No clear recommendations on this subject are given in previous or recent Dutch guidelines for general practice because of insufficient evidence (10,11). The Scottish national guideline (24) mentions intermittent use as an alternative, if necessary, for patients with functional dyspepsia but explanation of conditions or evidence is lacking. Greater insight into the value of use on demand is needed to assess the finding that a considerable number of dyspepsia patients use their medication on demand, instead of continuously in compliance with their prescription.

Selection bias as well as self-report bias may have been present in this study. The non-responders were comparable in age and sex with the responders. In a Dutch study (25) on patients using long-term acid-suppressive drugs, the mean age and percentage of women were similar to those in our study. Self-reported information concerning use on demand was

about the same as that mentioned in a cross-sectional study on patients in general practice (7). Self-reports may be unreliable because of errors or other factors; we tried to reduce these issues as much as possible by using examples and asking patients to tick boxes.

More frequent evaluation of medical treatment by GPs may contribute to changing patients' patterns of drug use. More visits to GPs have an effect on both on-demand use and the use of non-prescribed drugs (this study). Therefore, it should be possible to increase the appropriate use of drugs for dyspepsia through communication on this subject. According to the Dutch guideline for general practice (10) all patients on long-term prescriptions should be seen at least once every 6 months. This policy could result in an increase of on-demand use of prescribed drugs, which suggests that GPs are not aware of or do not accept how patients take their prescribed drugs. When the decision to take medication on demand is shared by the GP and the patient this could result in better evaluation of medical therapy.

It has also been suggested that patients experience other factors, such as lifestyle and habits, as being responsible for the burden of dyspepsia (6). This implies that the appropriate use of drugs for these patients might be of less importance.

Clear information to patients about how to use their prescribed dyspepsia medication and when to stop taking it could contribute to decreasing unnecessary drug use but to date this is lacking in practice (14). Shared decision-making might influence patients' adherence to treatment decisions (26). The results of this study suggest that communication on use according to the prescription, use on demand, use of OTC drugs, and health education should be addressed to all patient groups. Further studies on these topics could focus on shared decision-making for patients with dyspepsia to improve medical care.

#### ACKNOWLEDGEMENTS

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