

# Long-term prescribing of proton pump inhibitors in general practice

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## SUMMARY

**Background.** Proton pump inhibitors (PPIs) constitute the largest sector of the National Health Service (NHS) community drugs bill (£238m; 5.6%). Little is known of the long-term prescribing component of this.

**Aim.** To study the extent, the reasons for, and the cost implications of the long-term prescription of PPIs in general practice.

**Method.** Subjects on long-term therapy were identified by searches of computerized and paper records from three practices, comprising 21 GPs with 46 650 patients, representing a population cross section in north-east England.

**Results.** Two hundred and nine (0.45%) patients were on long-term PPIs (range between practices = 0.3% to 0.55%); 87% were on omeprazole, 13% lansoprazole; average age = 60 years (male = 56 years, female = 64 years; range = 14 to 91 years); male to female ratio = 47:53. The main indications were 'reflux' (39%), 'oesophagitis' (17%), non-specified 'dyspepsia' (24%), 'peptic ulcer' (8%). During the study year, 1952 prescriptions (28-day courses) were issued: a mean of nine per patient (range = 1 to 8). Sixteen per cent of patients requested fewer than six prescriptions, 27% requested between six and nine prescriptions, and only 21% requested sufficient prescriptions for the entire year. The average cost was £3707 per general practitioner per annum, or £320 000 for the district, representing 40% of the total PPI bill.

**Conclusion.** Of the total population, 0.45% were prescribed long-term PPIs; most for symptom relief. The long-term component comprised 40% of all PPI costs estimated at £100 million per annum for the United Kingdom. Most patients took their treatment only intermittently. More research is needed into strategies for rationalization of long-term PPI therapy. For most patients, doctors can advise on-demand rather than regular once-daily therapy.

**Keywords:** proton pump inhibitors; prescribing; general practitioners.

## Introduction

THE use of proton pump inhibitors (PPIs) has grown dramatically since their advent, and they now constitute the largest expense for any single drug group in the United Kingdom (UK). In 1995 they comprised 5.6% of the National Health Service (NHS) community drug bill, amounting to £238 million<sup>1</sup> within

an expanding market. In 1996 the total NHS cost for all acid suppression drugs (ASDs), of which PPIs formed the largest sector, was £522 million out of the total gastrointestinal market of £699 million. Much of the prescribing experience with PPIs has mirrored that of the H<sub>2</sub> receptor antagonists (H<sub>2</sub>RAs). These were initially confined to patients with identified ulcer disease but are now used for a variety of reasons in both secondary and primary care, and can even be purchased without a prescription. Both groups of drugs were initially licensed for short-term use but are now commonly used for long-term maintenance.

In a general practice study in 1995,<sup>2</sup> 10% of all patients on long-term acid suppression therapy were on PPIs. Furthermore, up to one-third of them took their drugs on a self-determined regimen rather than regularly.<sup>2,3</sup> While the use of intermittent H<sub>2</sub>RAs for symptom relief is considered acceptable, PPIs are prescribed in the expectation that they will be taken as continuous therapy. Although pressure remains on general practitioners (GPs) to prescribe 'appropriately',<sup>4</sup> there remains a lack of clinical data on the use of PPIs in practice.

The purpose of this study was to assess the use of long-term PPIs in general practice, to identify reasons for their use, to evaluate their usage by patients, and to quantify the costs of this prescribing.

## Method

A long-term prescription was defined as a repeat prescription for PPIs that had been commenced at least 12 months previously and was obtainable by the patient without a further consultation with the GP; i.e. on a 'repeat' basis. This is conventional practice in the UK for patients on long-term therapy (e.g. for antihypertensives), usually with built-in supervision checks, and has been labelled as the 'authorized repeat prescription'.<sup>5</sup> Acute prescribing was excluded, the emphasis being on patients who were established on therapy. A prescription unit was defined as a 28-day supply of the drug at the dose intended by the prescribing GP.<sup>6</sup>

## Setting and data collection

The study was set in three general practices in Stockton on Tees, northern England, with a combined patient population of 46 650 made up of lists of 7000, 14 500, and 24 350, and served by 21 GPs. The practices represented a cross section of inner-city and suburban residents and comprised 25% of the total population of the district.

Information was collected by a systematic search of computerized prescribing databases. All three practices had AHH Meditel systems and operated computerized repeat prescribing. The computerized search was supplemented by a review of the patients' paper records for inclusion of prescriptions issued by hand; for example, during home visits.

Information was collected for all repeat PPI prescriptions (omeprazole and lansoprazole, generically or by brand) issued by computer or recorded in the notes during the 12 months preceding the study. Information collected included type and dose of PPI prescribed, changes of preparations within the PPI group, the number of prescriptions collected by each patient during the 12-month study period, concurrent prescribing, details of recorded diagnosis, and smoking and alcohol consumption details. No

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**Table 1.** Recorded reasons for prescribing long-term proton pump inhibitors (PPIs) (Total number of patients = 208).

Reason for prescription	Number of patients	Percentage
Oesophagitis	56	16.8
Reflux	135	38.5
Hiatus hernia	4	1.4
Dysphagia	4	1.4
Oesophageal stricture	5	1.5
Oesophageal ulcer	2	0.7
Duodenal ulcer	20	0.6
Gastric ulcer	6	2.1
Gastritis	2	0.7
'Dyspepsia'	80	24
'Indigestion'	15	4.5
'Abdominal pain'	5	1.5
Chronic hepatitis	1	0.3
Excessive salivation	1	0.3
Not recorded	1	0.3

Some patients had more than one diagnosis recorded.

**Table 2.** Pattern of issue of proton pump inhibitor (PPIs) prescriptions.

Number of prescriptions issued during one year	Number of patients	Percentage
1 to 5	34	16.3
6 to 9	57	27.4
10 to 12	73	35.1
13 or more	44	21.2

Number of 28-day prescriptions required for a full year = 13.

attempt was made to compress diagnoses into categories, and these were noted as in the medical records. The data were collected using a printed form and transferred to an Epi-Info 5 database by two assistants independently. Double data entry and a random audit of 25% of entries against the original records were performed to confirm accuracy.

## Results

### Patients

Of the study population of 46 650, 209 (0.45%) patients were discovered to be on long-term PPIs, ranging from 0.30% to 0.55% of the total population for each practice: an average of 10 patients per GP. The patients' average age was 60 years (range = 14 to 91 years), comprising 47% males (average age = 56 years; range = 14 to 88 years) and 53% females (average age = 64 years; range = 22 to 91 years). The female to male ratio in the group aged 65 years and over was 2:1.

Sixty-eight per cent of the patients were recorded as consuming less than 21 units of alcohol per week, 8% were recorded as consuming more than 21 units, and no data were available for 24%. Smokers constituted 18% of the total, 68% were non-smokers, and no information was available for 14%.

### PPIs prescribed

Of the 209 patients, 87% were prescribed omeprazole and 13% lansoprazole at the time of the study. Pantoprazole had just become available in the UK and did not feature in the study.

The most common prescribed dose of omeprazole was 20 mg daily (73% of all patients), followed by lansoprazole at 30 mg

(13%), omeprazole at 40 mg (7%), and omeprazole at 10 mg (6%). The patients' drug histories indicated that 8% had been changed from omeprazole to lansoprazole in the previous year and 4% vice versa.

### Investigations and indications for prescribing

The following investigations had been performed prior to the commencement of long-term therapy: gastroscopy (60%), barium meal/swallow (11%), gastroscopy and barium examination (7%), and no investigation (22%).

The most common reason for long-term prescription was gastro-oesophageal reflux disease (GORD), with oesophagitis, reflux, and hiatus hernia accounting for 57% of diagnoses. In addition, dysphagia, oesophageal stricture, and oesophageal ulcer accounted for 4%. The next category comprised non-specific dyspepsia/indigestion (29%). Morphological abnormalities (oesophagitis, oesophageal stricture/ulcer, peptic ulcer, gastritis) were present in 28% of the patients, while physiological or 'functional' problems (reflux, hiatus hernia, non-specific dyspepsia, indigestion, abdominal pain) accounted for 70%.

### Concurrent prescribing

One hundred and fifteen (55%) patients were being prescribed other drugs in addition to the PPI. The number of co-prescribed drugs ranged from one to 19 (mode = 2). Forty-eight (23%) patients were on a non-steroidal anti-inflammatory drug and 12 (6%) were on aspirin. Other co-prescribed drugs were Gaviscon (46 patients, 22%), co-proxamol (39, 19%), salbutamol inhaler (22: 11%), paracetamol with codeine (20, 10%); lactulose (20, 10%), beclomethasone inhaler (14, 7%), paracetamol (14, 7%), thyroxine (11, 5%), and nifedipine (10: 5%). Two (1%) patients were on warfarin.

### Prescriptions

Based on the precept that a single PPI prescription covered 28 days' treatment, each patient would have theoretically required 13 issues for a full calendar year. The mean number of prescriptions issued per patient was nine (range = 1 to 18; total number issued to 209 patients = 1952). There was no difference in issue rates between males and females (mean males = 9.3, range = 2 to 18; mean females = 9.5, range = 1 to 16). One-fifth of the patients collected 13 or more prescriptions and 44% collected nine or less.

### Costs

We attempted to quantify the costs of this long-term PPI prescribing. On the basis of the current costs of the preparations,<sup>7</sup> the total cost for the three practices for the 12-month period was £77 852; an average of £3707 per GP. By extrapolation, the cost for the Stockton district, which is equivalent to an average health district in the UK (population of 190 000), was £320 000. For the whole of England, extrapolated costs were £88 million. Figures for all PPI prescribing for the Stockton district and England as a whole, for the year of the study, were £807 479 and £246 450 450 respectively (data supplied by Pharmacy Advisor, Tees Health Authority). Based on this, long-term prescribing represented 36% to 40% of total PPI costs.

## Discussion

This primary care study highlighted a number of features, the most notable of which was the proportion of the general population on long-term treatment with PPIs. Perhaps unsurprisingly, the majority was being treated for symptom relief, as the com-

monest diagnoses comprised non-structural problems, mainly GORD. While 8.8% were being treated for peptic ulcer, it is likely that some of those with non-specific 'dyspepsia' and 'indigestion' had symptoms that overlapped with GORD, rather than having non-ulcer dyspepsia of gastroduodenal origin.

Prior investigations had been performed in 78% of the patients, probably a reflection of the local availability of open access gastroscopy.<sup>8</sup> It is also likely that a normal endoscopy report in patients with persisting symptoms led to a trial of PPI suppression therapy in some patients whose treatment then became established. The evidence of considerable co-prescribing suggests that some patients were prescribed PPIs for protection or to relieve drug-induced dyspepsia. Over a fifth of the patients were also prescribed Gaviscon, an alginate; probably indicative of GPs' perceptions of its superiority over simple antacids for reflux. It is likely that many patients also purchased over-the-counter remedies, including acid H<sub>2</sub> receptor blockers.

While the long-term prescribing of PPIs for structural lesions (e.g. Barrett's oesophagitis) remains relatively uncontroversial, long-term treatment for symptom relief is more contentious. Concerns have been voiced about the long-term effects of PPIs in patients who are *Helicobacter pylori* positive and in whom the development of atrophic gastritis has been described.<sup>9</sup> In GORD, H<sub>2</sub> receptor blockers are inferior as their effect is only variable in more than mild disease<sup>10</sup> and also because patients can develop tolerance to them. In comparison, PPIs are more consistent and provide faster symptom relief.<sup>11,12</sup>

Heading<sup>13</sup> has pointed out that not every patient requiring acute treatment for GORD needs long-term management, and that many others could be improved by intermittent symptomatic therapy. In attempts to predict those for whom long-term maintenance therapy is necessary, the presence of structural lesions, low tonic pressure at the oesophageal sphincter, and nocturnal reflux are considered pointers.<sup>14,15</sup> However, these tests are not routinely carried out in patients managed in primary care and the decision to institute long-term therapy is generally made on clinical grounds by the GP. Patient-determined factors, such as the presence of symptoms, are also likely to influence the patterns of PPI consumption, as judged by the variability in the number of prescriptions requested.

Richter<sup>16</sup> stated that 'GORD is a chronic problem requiring long-term management in most patients.' Whether the high costs of treatment for non-structural (and therefore, presumably, non-dangerous) conditions is justified, remains open. This study indicated that 40% of all PPI prescribing is for long-term users. Alternative strategies for these patients include possible rationalization of therapy and costs through reduced doses, switching from one preparation to another within the PPI group, and a return to the H<sub>2</sub>RAs in some. Research is needed into factors influencing prescribing behaviour and factors influencing patients in their use of such long-term therapy. As many patients take their PPIs to their personal requirements, is it appropriate that physicians should continue to prescribe them to a daily regimen rather than as required for most indications?

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