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How effective are primary care pharmacists at running dyspepsia clinics for patients prescribed PPIs?

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Abstract

Title

How effective are primary care pharmacists at running dyspepsia clinics for patients prescribed PPIs?

Author list

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Introduction

As a consequence of the low cost and perceived safety, proton pump inhibitors (PPIs) are widely prescribed but they can cause long-term adverse effects and are often overprescribed. For most patients PPIs should not be continued long-term as patients can become dependent on PPIs and they are rarely stepped down/off treatment. We aimed to measure whether a dyspepsia review service could help patients on PPIs to step down/off treatment whilst still keeping them symptom free.

Methods

Pharmacists were provided with training on dyspepsia management. Four general practices were selected. Patients taking a PPI for more than two months were included. A list of exclusion criteria (e.g. active ulcers, newly initiated) was applied. Between six and eight dyspepsia review clinics were run at each site. Patients were booked into a 15-minute consultation. A concordance style consultation was held with clinicians providing information on dyspepsia management and exploring the patients' ideas, concerns and expectations about stepping down or stepping off treatment. A follow-up audit was performed at four months to determine if patients had remained stepped down/off. An economic evaluation of clinic costs and drugs savings was performed.

Results

A total of 508 patients were invited to a review; 136 did not attend and 58 were excluded due to not meeting the inclusion criteria, leaving 314 patients reviewed for step-down/step-off. Successful step down/step off was achieved in 257 people (82% of those reviewed).

The total cost savings of PPIs was £7,100. The additional cost of alginates was £1,207 giving a net saving on medicines of £5,893 per annum. Set-up costs were £1,194 and staff costs £3,524 to £5,156 giving total running costs, which vary dependent on the Agenda for Change (AfC) grade of pharmacist involved, of £4,720 - £6,351.

Conclusion

A dyspepsia review clinic is cost-neutral to run but, given that many patients are on polypharmacy, PPI step down might best be considered as part of a holistic medication review clinic.

Keywords: proton pump inhibitors, medication review, economic analysis.

Introduction

Proton pump inhibitors are generically available in the UK and are relatively inexpensive. As a consequence of the low cost and relative safety they are widely prescribed. In 2014 over 53 million items were dispensed in England at a cost of £116,359,000 (£2.19/item).¹ In 2010 around 40 million items were dispensed. Some studies suggest 1 in 10 of the population regularly take a PPI.² Despite being well tolerated PPIs can cause

long-term adverse effects such as osteoporosis, hip fracture, hypomagnesaemia, pneumonia, acute kidney injuries, myocardial infarctions and a potentially moderate increase in *Clostridium difficile* infections.³⁻⁹ PPIs are often overprescribed world-wide, with up to 70% having no indication.¹⁰

For most patients PPIs should not be continued long-term but stopping treatment can trigger gastric acid hypersecretion leading to the impression that the PPI is still required to treat

an underlying problem.¹¹ Patients could, therefore, become dependent on PPIs, which may explain why the numbers of items dispensed increases year on year. An additional explanation for the growth of PPI use is that reviews of PPIs are not occurring in general practice. Dyspepsia is not a long-term condition included in the Quality and Outcomes Framework (QOF - the annual reward and incentive programme detailing English GP practice achievement results).¹² Consequently, PPIs are less likely to be subject to an annual review. If prescribers also consider them to be cheap and safe and patients do not wish to stop taking them for fear of return of symptoms we have perfect conditions for unrestricted long-term prescribing. The National Institute of Health and Clinical Excellence (NICE) has produced guidance on the management of dyspepsia that advocates limiting the exposure to long-term prescribing of PPIs.¹³

We aimed to measure whether a dyspepsia review service could help patients on PPIs by stepping down or stepping off treatment whilst still keeping them symptom free. As the unit cost of PPIs is low we also wanted to perform an economic analysis of the cost-benefit to the National Health Service (NHS) of dyspepsia clinics. The specific objectives were to:

- identify patients prescribed PPIs as repeat medication
- determine the reason for the prescription for each patient
- identify those patients in whom it would be appropriate to step down treatment from a high dose* to a maintenance dose
- identify patients in whom stopping the PPI may be appropriate
- agree with patients a care plan for stepping down or stopping PPI treatments
- quantify the cost-benefit of the service.

* High dose is defined as omeprazole 40mg, 20mg, pantoprazole 40mg, lansoprazole 30mg, esomeprazole 40mg, 20mg and rabeprazole 20mg. Maintenance dose is defined as omeprazole 20mg, pantoprazole 20mg, lansoprazole 15mg or rabeprazole 10mg.

Method

Four practices in Bradford, UK were purposively selected to run the clinics. These practices represented a wide demographic of social and ethnic types. Searches were run on the practice's clinical systems to identify all patients prescribed a PPI as a long-term (repeat) medicine. From the lists the following inclusion and exclusion criteria were applied to identify patients suitable to invite.

Inclusion criteria

All patients taking a PPI for more than two months with an active prescription.

Exclusion criteria

- Patients on healing doses of PPIs < 1 month for uninvestigated dyspepsia.
- Patients on maintenance doses of PPIs < 1 month for non-ulcer dyspepsia.

- Patients on healing doses of PPIs < 2 months for GORD/peptic ulcer disease.
- Patients currently on H Pylori eradication therapy.
- Patients under review at a GI clinic or awaiting referral.
- Patients awaiting gastroscopy or review.
- Zollinger-Ellison Syndrome.
- Patients > 90 years old.
- Patients with terminal illness.
- Patients with grade 3 or 4 oesophagitis.
- Patients on high dose steroids with life threatening or chronic illness e.g. patients awaiting transplant, post-transplant patients.
- Patients receiving immune-suppression therapy.
- Patients undergoing chemotherapy or radiotherapy.
- Patients with oesophageal strictures or oesophageal dilation.
- Patients with a history of oesophageal varices.
- Patients with ALARMS signs and symptoms i.e. Anaemia, Loss of Weight, Anorexia, Recent onset of progressive symptoms, Melena, Swallowing difficulties

Available resources allowed between six and eight dyspepsia review clinics to be run at each site. As a result, not all patients could be invited to the clinics. Patients fitting the inclusion criteria were phoned by practice reception staff and booked into a 15-minute consultation at the general practice.

Clinic reviews

Pharmacists running the clinics were provided with training on dyspepsia management by a nurse experienced in dyspepsia review clinics and a GP with a Special Interest in gastroenterology (GPwSi Gastro). Training consisted of a half-day session on the management of dyspepsia and how to step down PPI treatments followed by mentoring of the pharmacists in their first dyspepsia clinic. The clinics were held between January and May 2015.

Clinic appointments were set at 15 minutes with 20 per day. At the review the clinician established the patient's understanding of the PPI indication and checked in the patient's record that the clinical circumstances pertaining to the use of PPI had not altered since the invite.

A concordance style consultation was then held where the clinician provided information on dyspepsia management and explored patients' ideas, concerns and expectations about stepping down or stepping off PPI treatment. If a patient agreed to step-down/step-off the patient's GP was asked to alter the repeat prescription. Where alginate therapy was required to 'bridge' the time period when acid hypersecretion (acid rebound) might be expected from stopping a PPI then the GP was asked to generate a prescription. Patients were also given advice and a leaflet on lifestyle advice (e.g. diet and weight loss).

Patients attending clinics were asked to complete a questionnaire about their symptom control. These were posted to patients at the end of the clinic with a stamped, addressed

envelope so it could be posted back anonymously. The questionnaire asked questions about whether the patient now had a better understanding of their condition, whether they now felt more in control of their condition and how well their symptoms were now controlled.

A follow-up audit of the clinic record was performed four months after the clinic on patients who had agreed to step down/step off to determine if they had remained on lower doses or were now off PPIs and to measure the change in alginate prescribing. This was done by checking clinical records for PPI (type and dose) and alginate prescription ordering.

Economic evaluation

The costs of screening lists of people prescribed PPIs to find suitable patients to invite was based on a mid-point Band 4 pharmacy assistant. Based on previous experience it was assumed that 250 records would need to be reviewed to find 150 suitable to invite and that screening could be done at a rate of 10 records per hour.

Suitable patients were invited by letter. An assumption was made that four hours of pharmacist assistant time was required to prepare and send out 250 invite letters by second class post.

The costs of a pharmacist to run the clinic was based on Agenda for Change (AfC) banding taken from the lower end of Band 6 to the top of Band 8B. Pharmacist costs were based on 15 minute appointments with two clinic sessions per day and 10 patients per clinic.¹⁴

Medicine costs were taken from the Drug Tariff.¹⁵ If a PPI was stepped down or stepped off or the patient had remained on at the lower dose or off treatment four months later the assumption was made that this was a long-term change and the medicine cost change based on one year of treatment. Alginate costs were calculated on the actual number of bottles ordered.

Results

A total of 1,000 patients prescribed a PPI were screened for suitability to receive an invite. A total of 492 patients were excluded before inviting, leading to 508 people being invited. At the clinic 136 patients did not attend and 58 were excluded because they did not meet the inclusion criteria, leaving 314 patients reviewed for step-down/step-off.

The outcome of the reviews is shown in Table 1. Successful step down/step off was achieved in 257 people (51% of those invited and 82% of those who attended and were reviewed).

Economic costs

The total cost savings on PPIs at the six month review was £7,100. The additional cost of alginates was £1,207, giving a net saving on medicines of £5,893 per annum. This equates to £11.60 and £18.70 savings for patient invited and attended respectively.

The costs of screening of records and inviting patients and running the clinics are shown in Table 2.

Patient feedback on symptom control

Patient feedback on their symptom control as a result of attending the clinic is shown in Figure 1. A total of 216 questionnaires were administered to patients and 89 (41%) were complete.

Discussion

Patients who attended a dyspepsia review clinic were very likely to have a step down of their PPI and to remain stepped down. These findings reflect those found previously.¹⁶⁻²¹ A previous study of PPI medicines optimisation reviews was able to show that the practices that reviewed their PPIs also achieved a reduction in upper gastro-intestinal (GI) referrals by 65% and a reduction in upper GI endoscopies by 82%.¹⁶ This unexpected

Outcome	Number achieving outcome	Proportion of those invited (n= 508)	Proportion of those reviewed (n= 314)
Stepped down	221	44%	70.5%
Stepped off	36	7%	11.2%
Refused to step down or off	23	4.5%	7.1%
Did not attend	136	27%	NA
Did attend but did not meet criteria	58	11%	NA
Reverted back at follow up	18	3.5%	6.2%
Had Left list or died at follow up	16	3%	5.0%
Total	508	100%	100%

Table 1: Outcome of the reviews

result was attributed to the education of patients and practice staff about dyspepsia management, reduced non-steroidal anti-inflammatory (NSAID) use or possibly increased/optimised PPI use in at-risk patients.¹⁶ Whilst the impact on referral rates was not measured in this study, it is possible that a similar result could be achieved due to the education of patients and staff in the same way.

The numbers of patients providing postal feedback on their symptom control as a result of attending the clinic was 89 (41% response rate). It may be that those who were satisfied with the clinic did not feel the need to respond. Most patients commented that they 'neither agreed/disagreed' or 'agreed'

with the statements (Figure 1). Around half of those who responded felt their symptoms had improved i.e. 22/40 (55%). However, half 'disagreed' or 'totally disagreed' showing that step down did not suit all patients. We do not know, however, if their symptoms worsened but, at review, only 6% had reverted back to their original dose. This shows the difficulty clinicians face when attempting to deprescribe or step down already established treatments where the patient may not want to undergo a change.

Prescriptions for non-attenders were not analysed so it is not known if any changes were made to their prescriptions without the intervention.

Screening records/inviting patients		Clinic costs	
Item	Data	Item	Data
Records screened	935	Pharmacist cost per day (range Band 6 to 8b) before on-costs	£101.10 to £221.62
Cost per hour of Band 4 midpoint (before on-costs)	£10.79	Room rent based on four hour clinic session (£10/hour)	£80.00
Cost at 10 records per hour	£874.23	Number of clinics held	£ 27
Patients invited	442	na	na
Time needed to send out letter	8 hours	na	na
Cost of sending letters with a second class stamp	£320.42	na	na
Total invite costs	£1,194.65	Total clinic costs	£3,525 to £5,156

Table 2: Economic costs of running the clinics

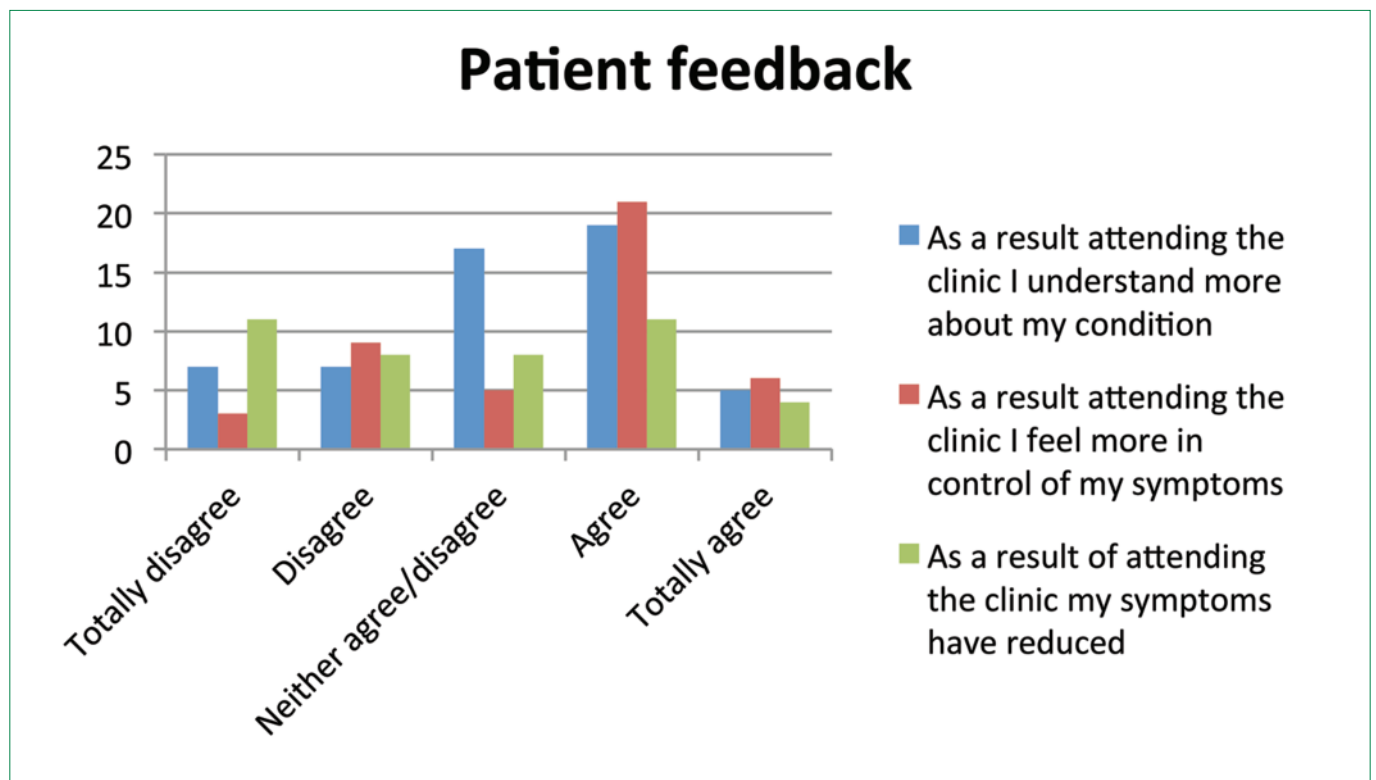


Figure 1: Patient feedback on symptom control

Whilst it is possible to step down PPI doses and step off PPIs, prescribing in England continues to increase.^{1,2} The likely explanation for an increase in prescribing volume is that patients are being initiated on PPIs and that patients currently prescribed PPIs are not having treatment stopped at the end of a course. PPIs are often prescribed for non-ulcer dyspepsia, an unlicensed indication in which PPIs are mostly ineffective.¹³ NICE recommend that, for Gastro Oesophageal Reflux Disease (GORD) and peptic ulcers, treatment doses are for short courses followed by a step down or off.¹³

One explanation as to why PPIs are maintained as repeat prescriptions is that they are perceived by prescribers to be relatively harmless, highly effective and low cost. However, whilst the unit cost of PPIs is low the cost of treating adverse events can be high. For example, the mean cost of a hospital admission for bacterial intestinal infection is £3,819, for a fracture of femur £6,312 and for a myocardial infarction £3,571.²² Estimates of the numbers needed to harm (NNH) from adverse effects with PPIs is shown in Table 3.

In the busy environment of general practice there may also be a reluctance to create potentially more work by reviewing PPIs. We have found a similar problem with the long-term prescribing of antidepressants where there is a reluctance by both the patient and the GP to discuss discontinuation of the medication because of fears about the consequences of doing so.²⁷ We have also found that when opioids are prescribed for non-cancer pain, where opioids are largely ineffective, they are often continued long-term.²⁸

Whilst we found that the majority of patients who attended could successfully have a step-down the running of dyspepsia clinics requires an investment in clinician and patients' time and resources. Our findings show that stand-alone dyspepsia clinics have set-up costs of £1,195 and staff costs of £3,525 to £5,156, dependent on the AfC grade of pharmacist involved. This gives total costs of £4,720 - £6,351 compared to savings made from step down of PPIs after allowing for additional alginate costs (£5,893). Quality of life scoring was not conducted.

Stopping PPIs can help reduce and could reduce costs to the NHS of these associated conditions such as Acute Kidney Infection, C difficile, pneumonia and osteoporosis, which may worsen with a PPI (Table 3).^{23,24,25,26} This significantly helps

strengthen the rationale for encouraging dyspepsia review clinics. It is possible to estimate the cost implications of the current prescribing of PPIs at practice or CCG/HB level. Based on published clinical incidence data and Hospital Episodes Statistics (HES) data to give an indication of the complication related cost savings. The potential savings on avoidance of complications is based on incidence of such complications in patients on PPIs and what reduction in these complications is expected if a proportion of patients are stepped off a PPI. Supporting clinical evidence is shown in Table 3.

It was also identified through a baseline audit of PPI patients¹⁶ that patients were found to be taking an average of seven medications including their PPI, with 79% on four or more medications, making this group an ideal target for polypharmacy medicines optimisation reviews.

Given that PPI reviews are important, how could they be achieved? There are three potential models for reviewing and stepping down PPIs that could apply to routine general practice care in the UK (Table 4). This study has demonstrated the benefit of having a pharmacist run dyspepsia clinics but including a dyspepsia review as part of a practice pharmacist holistic medication review may provide additional benefit. Dyspepsia is commonly found in patients who also have comorbidities such as diabetes, cardiovascular disease and depression.²⁹ PPIs could therefore be used as an 'index drug' to target patients for multi-morbidity polypharmacy reviews. The key to success would be training for pharmacists on dyspepsia reviews.

When a medicine is prescribed often, only the unit cost of the medicine is considered as the cost but there are other associated costs with prescribing such as initial diagnosis,¹⁰ decision making about the best treatment option, agreement with the patient about their preferred choice of treatment, review of efficacy and adverse effects on an ongoing basis.

Conclusion

In the case of PPIs it is our experience that little or no time is given to patient involvement and development of self-care in treatment decision or ongoing review, which makes these treatments less expensive to prescribe but is also resulting in the large rise in PPI prescribing across the UK. Whilst a 'stand alone' dyspepsia review clinic is cost effective, it could be a more cost

Diagnosis	Numbers needed to harm (NNH)
Hospital-acquired pneumonia (HAP)	200 (relates to all acid suppressing drugs) ²³
Community-acquired <i>C. difficile</i>	899 ²⁴
Hospital-acquired <i>C. difficile</i>	67 (unselected hospital admissions) ²⁴
Hip fractures	1,960 ²⁵
Acute Kidney Injury	120 in patients aged 66 years and above ²⁶
Acute interstitial nephritis	4,761 in patients aged 66 years and above ²⁶

Table 3: Estimates of numbers needed to harm

Method	Description of method	Advantages	Disadvantages
Stand-alone dyspepsia clinics	Patient on PPIs identified and invited into a dyspepsia review clinic.	<p>Step down rate for patients who attend is high.</p> <p>Patients given quality time to explain dyspepsia and self-management, which could improve long-term quality of life.</p> <p>Staff running clinic are trained and skilled in dyspepsia reviews.</p>	<p>Resources required to identify and invite patients.</p> <p>High 'DNA' rate.</p> <p>Inconvenience for patients as only having one condition reviewed and they may not consider it a problem.</p> <p>Not a cost-effective model of care.</p>
Inviting in individual 'high risk' patients for GP or practice pharmacist holistic medication review.	<p>Patients on PPIs are invited in for a holistic medication review of all of the medicines and medicine needs, which is done at their normal annual or biannual medication review date.</p> <p>Focus is on patients with polypharmacy and patients who are on high risk medicines such as NSAIDs, anticoagulants, DMARDs, etc</p>	<p>Patients gain more from a holistic review than just from a review of one of their medicines.</p> <p>Patients would be seen anyway so does not unduly inconvenience them.</p>	<p>GPs and pharmacists are not skilled to do dyspepsia reviews and training would be necessary.</p> <p>Behaviour change techniques would need to be applied to motivate and remind staff to review PPIs.</p> <p>Sufficient time would need to be set aside to provide a useful review that engages the patient.</p> <p>It may not be possible logistically to invite in all PPI patients, especially if not on other medicines that would warrant a face-to-face review.</p>
GP or practice pharmacist reviews as part of a multi-morbidity holistic review	<p>In this type of review patients with multi-morbidity and polypharmacy are invited in for a review of all of the medical conditions rather than piecemeal reviews of individual conditions.</p> <p>At the multi-morbidity review the pharmacist concentrates on reviewing and optimising the medicine for each condition including for dyspepsia. GPs and nurse concentrate on clinical assessments and diagnosis of new problems.</p>	<p>Dyspepsia can be reviewed within the context of the patient's medical conditions and wishes for future care.</p> <p>Patients gain more from a holistic review than just from a review of one of their medicines.</p> <p>Patients would be seen anyway so does not unduly inconvenience them.</p>	<p>Multi-morbidity reviews are not yet widely adopted into the NHS and best models of delivery have yet to be tested and established.</p>

Table 4: Potential models for reviewing and stepping down PPI doses showing advantages and disadvantages of each approach

effective approach, and less inconvenient for patients, if PPI reviews formed part of a holistic medication review. Clinical Pharmacists in general practice should be trained on how to undertake dyspepsia reviews.

Declaration of interests

Dr. Petty reports grants from Reckitt Benckiser, during the conduct of the study.

Jane Allan reports a salary payment during the conduct of the study (employed by Ashfield Healthcare) and that the education project was sponsored by Reckitt Benckiser.

Dr. Silcock reports grants (National Institute for Health Research, Health Education England) and personal fees (University of Manchester, University of Bergen, Medway School of Pharmacy, Queen's University Belfast) outside the submitted work.

Dr. Dawson reports grants from Reckitt Benckiser, during the conduct of the study.

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