

CLINICAL AUDIT

Inappropriate prescribing of proton pump inhibitors in primary care

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Objectives: To determine if an educational intervention initiated in secondary care can influence prescribing of proton pump inhibitors (PPIs) in the community.

Methods: A prospective study of PPI use in patients admitted to medical wards in a university hospital. A simple educational intervention was employed to reduce inappropriate prescribing of PPIs in the community.

Results: In the pre-intervention analysis 66/271 (24%) patients were receiving treatment with a PPI prescribed in the community. In 36/66 (54%) patients the PPI had been prescribed inappropriately. Six months after the intervention 91/344 (26%) patients were prescribed a PPI in the community. In only 45 of these 91 (49%) patients was there a recommended indication.

Conclusion: The intervention used in this study had no effect on the proportion of patients taking a PPI at the time of hospital admission or on the appropriateness of prescribing in the community.

Proton pump inhibitors (PPIs) are one of the most commonly prescribed groups of drug in the UK. In 2001 the NHS in England and Wales spent over £300 million on these drugs.¹ PPIs are indicated in the treatment of acid related dyspepsia and peptic ulcers and are an integral part of eradication therapy for *H pylori* infection. Several guidelines have been published related to their use.^{1,2} The National Institute of Clinical Excellence (NICE) published guidance on the use of PPIs in the treatment of dyspepsia in July 2000,¹ though this was later replaced by a longer and more discursive document on the management of dyspepsia in primary care in August 2004 (revised July 2005).²

The guidelines made the following recommendations on indications for prescribing PPIs:

1. Patients with severe gastro-oesophageal reflux disease (GORD) symptoms or those with proven pathology (for example, oesophageal ulceration, Barrett's oesophagus) should be treated with a healing dose of a PPI until the symptoms have been controlled. Maintenance treatment with low dose PPIs will prevent recurrent GORD symptoms in 70–80% of such patients.
2. Patients with documented duodenal or gastric ulcers should be tested for *H pylori* and treated with PPIs and antibiotics if positive. In patients negative for *H pylori* or who remain symptomatic despite *H pylori* eradication therapy, PPI use is appropriate for symptom control and until ulcers heal.
3. Patients with documented non-steroidal anti-inflammatory drug (NSAID) or aspirin induced ulcers who must unavoidably continue with NSAID/aspirin treatment should be co-prescribed a PPI.
4. Patients with uninvestigated dyspepsia may be given full dose PPI for one month to assess response.
5. Patients with non-ulcer dyspepsia (NUD) or with mild symptoms of dyspepsia do not generally benefit from a PPI but may be prescribed a short, low dose course provided there is regular review.
6. All patients should be reviewed regularly to assess the continuing need for PPIs and to step down to less potent medication where possible

From our own experience it was evident that many patients admitted to the medical/elderly care directorate of the hospital were receiving regular PPI treatment for poorly defined reasons or for conditions where PPIs have not been shown to be useful. Such unapproved or inappropriate indications include non-specific abdominal symptoms without acid related features, co-prescription with aspirin, NSAIDs or corticosteroids in asymptomatic patients "just in case", but most often receiving a long term repeat prescription for a previous problem which had since resolved. Current evidence suggests PPIs are often overused.^{3–8}

PPIs are not without their side effects (diarrhoea, headache in up to 10%), and studies have linked the use of PPIs to an increased risk of community acquired pneumonia,⁹ *C difficile* diarrhoea,^{11–13} and *Campylobacter jejuni* gastroenteritis.¹⁴ PPIs also have interactions with many drugs¹⁵ and can occasionally cause severe adverse reactions such as hepatic, renal, skin, and bone marrow toxicity and anaphylaxis.¹⁶ These factors emphasise the importance of following well constructed, evidence based guidelines.

The aim of our study was to determine if a simple intervention would reduce the number of patients prescribed PPIs unnecessarily or inappropriately.

METHODS

Two hundred and seventy one patients admitted to general medical wards in a 550 bed university hospital (which serves as a district general hospital for central Swansea and rural Gower) were assessed in the pre-intervention group. We aimed at obtaining a cross sectional picture of all acute medical/elderly care patients in the hospital at a single time point. In practice, because of the large number of patients involved, the audits were undertaken one ward at a time on successive days during one week, covering six medical wards, coronary care unit, high dependency unit, and medical outliers on non-medical wards. The pre-intervention audit was done twice, four months apart, to ensure the findings were relatively constant. The number of patients in each of these two pre-intervention audits and the findings were very similar so the data have been combined for ease of analysis.

Abbreviations: GORD, gastro-oesophageal reflux disease; NSAID, non-steroidal anti-inflammatory drug; PPI, proton pump inhibitor

Review of the clinical notes, drug prescription chart, casualty admission card or referral letter from primary care were used to determine whether a patient was being prescribed a PPI at the time of admission.

If a patient was receiving treatment with a PPI we tried to identify the indication and enquired about current or previous dyspepsia and whether the PPI helped the symptoms. The old medical records were also examined and any information about previous PPI prescribing from secondary care and any relevant investigations were noted. A pro forma was completed with these details. The audit protocol did not allow for changes to be made to PPI prescriptions even if they were deemed inappropriate by the auditor, nor was any attempt made to alter the management of hospital inpatients receiving care from other medical teams.

The results of the pre-intervention audits were discussed at hospital medical department audit and clinical meetings. A résumé of the findings, along with the NICE guidelines on dyspepsia and PPI prescribing, were then sent to all general practices in the area. The audit was then repeated three and six months later using the same method of data collection to see whether any change in prescribing patterns had ensued. This should have allowed sufficient time for any change in prescribing of PPIs in the community to be observed in acute medical admissions. As with the pre-intervention audits, the findings of the two post-intervention audits were remarkably similar, showing no directional trend, and so the data were combined to simplify analysis.

The study was approved by the hospital audit committee.

RESULTS

In the pre-intervention survey 66/271 (24%) medical/elderly care patients were receiving treatment with a PPI at the time of admission to the acute medical wards of this hospital serving a largely urban population of approximately 200 000. In 36/66 (54%) patients the PPI was prescribed for an indication outside those proposed in current guidelines. Among those 36 patients we could find no indication at all for PPI treatment in 22, in whom there were no symptoms of dyspepsia and no history of actual or potential upper gastrointestinal problems. Five patients had previously had a gastric or duodenal ulcer but gave no history of dyspepsia and had not previously been tested for, or treated for, *H pylori* infection. Four patients had continued to receive PPIs long term after *H pylori* eradication treatment for gastric ulceration despite having no symptoms. Three patients had been prescribed a PPI for vomiting of uncertain cause and two patients were prescribed a PPI for lower abdominal pain. These indications were deemed inappropriate. Correct indications for prescribing PPI included 15 patients who gave a history consistent with GORD, nine patients who were recently suspected of having a gastric or duodenal ulcer and were under review, five who were being prescribed an NSAID and required gastric protection because of dyspeptic symptoms, and one who had a confirmed peptic ulcer and was having *H pylori* eradication treatment.

After the initial audit and educational intervention 91/344 (26%) medical/elderly care patients admitted acutely to the same hospital wards were found to be receiving PPI treatment at the time of admission. Of the 91 patients, only 45 (49%) were receiving treatment for an approved or appropriate indication. In 28 patients no indication at all could be found for prescribing a PPI, there was no relevant history, and the patients gave no history of dyspepsia. In four patients with conditions such as asthma and polymyalgia rheumatica PPIs were co-prescribed with corticosteroids as "cover", with no demonstrable evidence of peptic ulceration or dyspepsia. Four patients were prescribed PPIs for vomiting of uncertain cause and three for non-specific

abdominal pain. Three patients had continued to receive PPIs long term after having had previous *H pylori* eradication for gastric ulcers. Individual patients were prescribed a PPI for globus sensation, nausea, "protection against aspirin", and indeterminate chest pain.

Approved indications for a prescribed PPI included GORD in 29 patients, a suspected peptic ulcer under investigation in five patients, in conjunction with an NSAID in three symptomatic patients, and for *H pylori* eradication in two patients. In six patients it was not possible to ascertain the indication, either because the patient was unable to answer questions or the notes were incomplete.

The age of patients receiving a PPI was similar to that of all medical admissions to the directorate (median 69 years, range 16–98) and indeed comparable to that found in a large cross sectional study from primary care in northeast England.¹⁷

CONCLUSIONS

In our study around one in four patients admitted acutely to the medical/elderly care facility of a university hospital serving a mainly urban population were receiving treatment with PPIs at the time of admission. In only half of these patients was there an approved or appropriate indication for treatment according to current expert recommendations. PPIs are frequently prescribed for non-dyspeptic symptoms in the community,^{18 19} and the prescription is generally continued if a patient is admitted to hospital. Often the patient has been receiving PPI treatment for a long time and neither the primary care physician nor the admitting hospital practitioner has questioned the indication for its continuing use.

Our educational intervention in the form of a letter circulated to local general practitioners giving the findings of our audit and advice about PPI prescribing failed to have any effect on the high number of patients admitted to hospital who were taking these drugs, or on the appropriateness of such treatment. Possibly, our post-intervention audits were undertaken too soon after the original audits and a change in prescribing pattern had indeed started but had not yet gained sufficient momentum to be measurable. We believe this is unlikely as there was not even a trend towards improvement after the intervention. An alternative interpretation is that current guidelines and expert opinion on dyspepsia management and PPI use are too restrictive and out of touch with patients' expectations and general practitioners' experience. A more cynical explanation would be that PPIs are too often prescribed as a lazy alternative to taking a full and precise history as to the likely cause of the gastrointestinal symptoms.

In a study from Gloucester²⁰ educational intervention was shown to reduce prescribing of PPIs, but their methodology was very different from ours and only total prescription numbers rather than indications for treatment were recorded. An attempt to modify dyspepsia management in primary care in Greater Manchester²¹ suggested that educational outreach was more effective than passive guideline dissemination. However, an unexpected outcome of that programme was an increased expenditure on PPIs after the intervention. A study from Italy²² assessed the effect of dyspepsia guidelines in primary care linked to a pay deal for general practitioners. This resulted in a 26% reduction of PPI expenditure in comparison with non-participating general practices. The greater effect of intervention in these studies compared with ours may reflect a more direct personal approach to general practitioners in their workplace by enthusiastic educators but also shows that financial rather than educational incentives can be effective. Such enterprises are both expensive and time consuming in comparison with simple dissemination of written guidelines but may be more valuable in promoting good practice and,

ultimately, more economical. A recently published audit to assess and improve adherence to guidelines for surveillance of Barrett's oesophagus²³ showed that active intervention by trained coordinators is very effective, whereas passive provision of written guidelines achieves little.

Our own observations show that more thought is needed when PPIs are prescribed both in the community and in hospital practice (where the recommendation for treatment sometimes originated) to ensure appropriate, safe, and cost conscious prescribing. Too often PPIs are perceived as a harmless and relatively inexpensive remedy for any digestive problem, or as essential protection against possible or theoretical drug related gastric problems which a patient has yet to encounter.

Prescribing of PPIs should follow evidence based practice as inappropriate or unnecessary prescribing wastes valuable resources and can be harmful. The best means of promoting adherence to expert recommendations has yet to be determined but passive dissemination of written guidelines was ineffective in our study.

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There are no competing interests.

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