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Gastroprotection in trauma patients receiving non-steroidal anti-inflammatory drugs

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ABSTRACT

Background: NSAIDs are commonly used analgesic agents in the orthopaedic trauma setting. Evidence-based guidelines recommend that patients with one or more risk factors for NSAID-associated gastrointestinal (GI) ulcer complications should be prescribed gastroprotective agents to minimise the risk of serious ulcer complications, including gastrointestinal haemorrhage. The purpose of the present audit was to evaluate and improve the adherence to these guidelines in new-NSAID users in a trauma unit at a district general hospital.

Methods: A retrospective observational cohort study was conducted over an 18-week period to assess pre-intervention practice. Subsequently, an awareness programme, including prescriber and pharmacist education and the use of reminder posters, was implemented. Following this, data were collected prospectively over 9 weeks to assess any change in performance. Assessment involved review of case-notes and prescription charts of all adults (aged ≥18 years) who were commenced on regular NSAIDs on or during admission to the Trauma Unit.

Patients were risk-stratified according to the number of risk factors, which were defined as age ≥65 years, major comorbidity, oral steroids, anticoagulation, history of upper gastrointestinal ulceration or bleeding and prescription above the normal recommended dose of NSAIDs. The American College of Rheumatology guidelines recommend the use of gastroprotective agents when one or more risk factors was present. Prescription of gastroprotective drugs was recorded to measure adherence to evidence-based guidelines.

Results: A total of 644 patients were reviewed over the study period, 451 pre-intervention and 193 post-intervention. 100 patients fulfilled the inclusion criteria pre-intervention and 49 post-intervention. Before intervention, the proportion of high-risk NSAID-receivers co-prescribed gastroprotection was low at 25.3%, although the likelihood of adherence improved with the number of risk factors; overall adherence rate improved significantly following intervention at 73.1% ($\chi^2 = 18.8$, $p < 0.001$). Furthermore, a smaller proportion of NSAID-receivers fell into the high-risk category from 75% to 56.5% ($\chi^2 = 7.25$, $p < 0.05$).

Conclusions: (1) The majority of trauma admissions are at high risk for developing gastrointestinal haemorrhage. (2) Initial adherence to national guidelines for safe prescription of NSAIDs in our trauma unit was poor (25.3%) but improved significantly (73.1%) following an awareness programme which included education of prescribers and pharmacists. (3) A lower proportion of NSAID-receivers had multiple risk factors following our awareness

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programme. (4) Awareness of gastroprotection guidelines must be raised in trauma units to prevent undertreatment and hence minimise the risk of GI haemorrhage.

Introduction

Non-steroidal anti-inflammatory drugs (NSAIDs) are effective analgesic and anti-inflammatory agents that have been recommended by the World Health Organisation for the first-line management of pain. However, their side-effect profile includes upper gastrointestinal (GI) haemorrhage, acute renal failure and congestive heart failure.[1–5] Multiple treatment guidelines have suggested that patients with one or more risk factors for NSAID-associated GI ulcer complications should be prescribed gastroprotective agents to minimise the risk of serious ulcer complications, including GI haemorrhage.[6–8]

Risk factors associated with the use of NSAIDs and adverse upper GI haemorrhage include: [6–9]

- Age ≥65 (↑ risk by 5–6 times)
- Major Systemic Comorbidities
- Oral steroids (↑ risk by 4–5 times)
- History of Peptic Ulcer Disease/Upper GI Bleed (↑ risk by 4–5 times)
- Anticoagulants (↑ risk by 10–15 times)
- High (>2 × normal) dosage of NSAID (↑ risk by 10 times)

The widespread use of NSAIDs, together with the high incidence of trauma orthopaedic events that require hospital admission, mean that the safe prescription of NSAIDs represents an important clinical and epidemiological issue. There is much evidence to show that GI toxicity is associated with chronic NSAID use, especially in the context of rheumatoid and osteoarthritis. It has been estimated that GI haemorrhage related to NSAID use accounts for at least 2600 deaths amongst patients with rheumatoid arthritis in the USA annually.[5] However, it has also been well-documented that acute GI haemorrhage can occur as a result of short-term NSAID administration, and that admission into hospital, independent of NSAID intake, is in itself a risk factor for upper GI haemorrhage.[11]

Guidelines for the safe prescription of NSAIDs have been developed by the American College of Rheumatological Society for pain control in patients with osteoarthritis.[5] These recommend the use of misoprostol (≥600 μg/day) as first-line gastroprotective therapy or omeprazole 20 mg once daily as an alternative for patients on NSAIDs who have one or more risk factors. Omeprazole has been shown to be equally effective and better tolerated.[10] Furthermore, our local Trust guidelines recommend the use of omeprazole rather than misoprostol for gastroprotection. There are no specific guidelines for the safe prescription of NSAIDs in the trauma orthopaedic setting. However, it is reasonable and logical to assume that the safe prescription of NSAIDs must also apply in this context.

The purpose of this audit was to assess the safe prescription of NSAIDs with regard to the risks of GI haemorrhage and improve adherence to evidence-based guidelines on gastroprotective strategies in new-NSAID-users in the trauma orthopaedic setting in a District General Hospital.

Method

The study population, obtained from the local Trauma and Orthopaedics admissions Access database (Microsoft Corporation, Seattle), consisted of emergency admissions under the Trauma and Orthopaedics Service of Stoke Mandeville Hospital, Buckinghamshire NHS Trust.

Inclusion criteria were: (1) minimum age of 18 years, and (2) commencement of NSAIDs at or during admission. Subjects on long-term NSAIDs and those who were commenced on NSAIDs on an irregular, as required, basis were excluded. Review of case-note and prescription charts was carried out for all patients. Demographic, diagnostic and management information, type of NSAIDs, type of gastroprotection and upper GI haemorrhage during admission were recorded.

Patients were risk-stratified according to the following:

(1) age ≥65 years.
(2) major systemic comorbidities.[b]
(3) past history of upper GI haemorrhage or peptic ulcer disease.
(4) concomitant use of oral steroids.
(5) concomitant use of anticoagulants.
(6) high or twice normal dosage of NSAID.

Patients without risk factor were deemed to have a 'background' risk of GI haemorrhage, whereas those with one or more risk factors were considered to be at 'high-risk'.

ACR guidelines state that those at 'high-risk' should be prescribed gastroprotection (misoprostol ≥600 μg/day as first line, or omeprazole 20 mg as an alternative) whereas those at 'background-risk' should not.[5] Adherence to these guidelines was recorded and statistical data analysis was performed.

Before intervention, a retrospective observational study was performed over an 18-week period between April and August 2008 inclusive (451 admissions). Various strategies aiming to improve practice were then implemented (see below). Following intervention, the same assessment of

[b] The guidelines do not define this category. We have interpreted this to be equivalent to an ASA score of III, i.e. severe systemic disease with definite functional limitation.