

Are β -blockers ever safe in asthma?

Practice audit and literature search triggered by the use of a significant event audit

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ABSTRACT

Aim: To audit an adverse event in an asthmatic patient, namely, the prescription of a β -blocker.
Method: Significant event auditing, and Medline and EMBASE/Excerpta Medica literature searches.
Results: Fourteen asthmatics (3.3% of the asthmatics on the practice list) were identified as ever having received a β -blocker. In all cases the history of asthma pre-dated the prescription of the β -blocker. These data and results of the literature search lead to discussion of the medicolegal implications of the event and possible changes to future management.
Conclusions: A significant event audit can provide an appropriate forum for reviewing care of an asthmatic patient. β -blockers are still prescribed for asthmatics despite the well known hazards, and the incidence of this is probably under-reported. The literature suggests that no β -blocker can be safely started in an asthmatic patient in general practice.

INTRODUCTION

Significant event auditing is a tool for learning from experience, and is seen as a key area of clinical governance.¹ It provides a means of reviewing formally the lessons which may be drawn from a particular incident, by setting aside time and involving relevant members of the primary healthcare team. Events do not have to be adverse, and the results of the discussion can be classified as:²

- Celebration (care shown to be exemplary)
- Needing no further action
- In need of further information such as a conventional audit
- Requiring immediate remedial action.

Respiratory diseases such as asthma are chronic conditions, punctuated by acute episodes, and involve different members of the primary healthcare team. As such, they are suited to the use of significant event auditing as a tool to examine and improve systems of care. This paper presents an example of one such audit, and the follow-up information obtained.

METHOD

Circumstances of event

A female patient, aged 52, attended in her usual doctor's absence for a review of the control of her hypertension. The notes revealed that a β -blocker (atenolol 50 mg daily) had been added to her regimen four months previously, but had been recently discontinued due to uncertainty as to whether it was affecting her asthma. This had been diagnosed two years previously and was managed with regular salbutamol (200 mcg up to four times daily as required) and beclomethasone (200 mcg twice daily) metered dose inhalers. The patient was advised to avoid further β -blockers and return for follow-up of her hypertension.

This event was considered appropriate for review by a significant event audit. A date was fixed for the meeting and, to inform the discussion, an audit of the practice records was made to find other cases, and a literature review undertaken to place the event in context.

Audit of practice records

The computer record was searched to identify all patients with a Read-coded history of asthma. The searches identified 419 asthmatics (9.3% of practice list), of whom 14 (3.3% of asthmatics) had ever received a β -blocker. Of these 14, there were five who had never been treated for asthma, one with no repeat treatment for asthma, and eight on repeat treatment with bronchodilators with or without inhaled corticosteroids. Six of the β -blocker prescriptions were for repeat medication. In all cases the β -blocker prescription was pre-dated by the history of asthma. Analysis of the patients' written notes and computerised prescribing records suggested that four of the eight patients on repeat bronchodilators had presented with symptoms following the prescription of a β -blocker which could be interpreted as an adverse reaction, namely increased cough and/or increased use of bronchodilators.

Literature search

A Medline search was carried out for articles since 1966. Two search strategies were used. Firstly the headings 'asthma' and 'adrenergic β -antagonists' were exploded and combined, and secondly a text search for the phrase ' β -blocker' was combined with 'asthma'. The resulting sets were searched for relevant articles, and the strategy was repeated on EMBASE/Excerpta Medica (1988 to present) to identify further citations.

Significant event audit

The event was presented for discussion at a partners' meeting, with the results of the practice audit and literature search. The medico-legal concerns were stressed. Prescription of β -blockers to asthmatics has in the past resulted in death leading to a coroner's inquiry, investigation by the General Medical Council on several occasions, and in one case a manslaughter trial, as well as civil actions in negligence, and the Medical Protection Society regards these events as indefensible on the grounds that the hazards are so widely known (personal communication, Panting G, 1999).

This event was viewed as an example of the need to maintain clinical vigilance independently of the computer. The fact that some adverse reactions were evident from the audit of written notes which were not detected at the time of the consultation was also emphasised, and further demonstrated the need to remain alert to this possibility. The importance of avoiding prescription of β -blockers to asthmatics in the future was the clear conclusion drawn.

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DISCUSSION

The figures from our practice audit, although small, show that β -blockers have been prescribed to asthmatics in our practice at a rate higher than that reported by large studies.^{3,4} The use of a significant event audit to examine this issue provided a safe and confidential environment in which to address this finding, and allowed full discussion, in a non-confrontational manner, of a prescribing practice which the evidence shows to be potentially hazardous and medicolegally indefensible. By approaching it in this way the anxiety engendered by discussion of individual prescribers was minimised, thus reducing barriers to a change of practice.

The extent of co-prescription of β -blockers to asthmatics is unknown, and likely to be subject to reporting bias due to the widely known risks. One large analysis of US prescriptions found that 1.4% of asthmatics had also had a β -blocker prescription filled,³ which is similar to the figure from Tayside of 1.7% for co-prescription of a β -blocker and β -agonist within 30 days of each other.⁴ Anecdotal case reports suggest that in special circumstances individual patients can be unaffected by the prescription of a β -blocker,⁵ and a small group of 12 asthmatic patients given β -blockers for co-existing cardiac disease were reported to suffer no decline in respiratory function.⁶ Many small volunteer studies of stable asthmatics (ranging from seven to 18 subjects) have shown measurable declines in respiratory function in response to propranolol, metoprolol and bisoprolol, pindolol, and atenolol,⁷⁻¹² although celiprolol, a cardioselective β -blocker with partial β_2 -agonist activity, appears to have little effect,¹³⁻¹⁵ even in high dose.¹⁶ Declines in respiratory function have also been documented following ophthalmic use of timolol, but not betaxolol.¹⁷ Individual responses to β -blockers in these trials were unpredictable, with even sub-therapeutic doses affecting some. The effects of β -blockers were reversible with β -agonists, leading some to suggest that co-prescription of β -agonists should allow the use of β -blockers.^{18,19} Such an approach would seem at best unpredictable and, outside of the laboratory, impracticable.

There is likely to be a considerable reporting bias in the effects of β -blockers since the studies cited were all small, carefully controlled single or few dose trials in stable asthmatics with a run in period. These results cannot readily be translated into everyday general practice, where even the safety of celiprolol cannot be assumed. The only conclusion that can safely be drawn is that no β -blocker should be started in an asthmatic patient in general practice.

CONCLUSIONS

- Significant event auditing can facilitate the discussion of difficult issues within the primary healthcare team.
- Prescription of a β -blocker to an asthmatic can occur in day to day practice, despite the known hazards and well-documented records.
- These events are likely to be under reported due to reporting bias, no doubt influenced by medicolegal concerns.

- A high level of vigilance is necessary to prevent such events, or to detect evidence of adverse reactions, which can be subtle.
- No β -blocker can be safely started in an asthmatic patient in general practice.

Further work

- A confidential enquiry could establish the true extent of co-prescription.
- A campaign to raise asthma sufferers' awareness of the risks of β -blockers, and other drugs, could prove beneficial. ■

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