Non-steroidal anti-inflammatory drugs and the asthmatic child

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INTRODUCTION

The administration of non-steroidal anti-inflammatory drugs (NSAIDs) to asthmatic children is a longstanding dilemma. Aspirin- and other NSAID-induced asthma is a well-recognized phenomenon, but the benefits of NSAIDs are also well known. Some factors that can influence the decision to give NSAIDs include: a history of previous use, severity of asthma, other atopic features (e.g. eczema, hay fever or nasal polyps) and the anticipated degree of postoperative pain. In addition, the level of paediatric experience may also contribute.

MECHANISM OF NSAID-INDUCED ASTHMA

There is no single pathway by which NSAIDs precipitate asthma. The underlying aetiology originates from the pharmacological action of the drug. This creates an imbalance of arachidonic acid metabolites by the inhibition of cyclooxygenase (COX) with more substrate for the lipoxygenase pathway. Leukotrienes, the products of the lipoxygenase pathway, are potent bronchoconstrictors and inducers of mucous hypersecretion and airway oedema (Levy, 2001).

EVIDENCE FOR NSAID-INDUCED ASTHMA

The estimated prevalence of asthma in children is approximately 10% in Europe. Laboratory-based studies have reported rates of aspirin intolerance in children at 12% with chronic asthma and 28% when asthma occurs with other atopic features, but these figures do not automatically translate to a sensitivity to other NSAIDs. A review article (Levy, 2001) analysing eleven adult cases from 1990–2000 reported four deaths, four intensive care unit admissions, one hospital admission and one case of reduced peak expiratory flow rate. Of these cases, one had not previously been diagnosed as asthmatic, four had no prior history of aspirin intolerance and five did not have nasal polyps or sinus congestion.

Of more relevance to children, a large randomized controlled trial (Lesko and Mitchell, 1995) looking at the treatment of febrile children with asthma using paracetamol *vs* ibuprofen provided more positive support for the use of NSAIDs. A total of 83 915 children were included and randomized to receive either paracetamol 12 mg/kg, ibuprofen 5 mg/kg or ibuprofen 10 mg/kg. Preliminary results from this trial showed that physician visits and asthma treatment at 1-month follow up were no worse in the ibuprofen group, and less in the high dose ibuprofen group. In total, no child developed anaphylaxis, but 44 children were hospitalized for non-serious asthma in the ibuprofen group (low and high dose groups combined) compared to 24 in the paracetamol group.

A much smaller study of 70 children (Short et al, 2000), specifically investigating lung function following the administration of diclofenac (1–1.5 mg/kg), showed no significant impairment in serial measurements. There were no reports of wheezing or increased bronchodilator use.

CURRENT CLINICAL PRACTICE

It is obviously sensible to avoid NSAIDs in those who are known to be intolerant. The Royal College of Anaesthetists' guidelines for the use of NSAIDs recommend avoidance in children with proven asthma especially if there is a history of nasal polyps, severe eczema or atopy. A simple survey involving 127 members of the Association of Paediatric Anaesthetists of Great Britain and Ireland revealed that about 90% of respondents were happy to give NSAIDs in asthmatic children who had no previous adverse reaction, falling to less than 50% for children with respiratory symptoms or severe asthma (Williams, 1999).

CONCLUSION

NSAID-induced asthma in children is rare, whereas its development in adulthood (third and fourth decade) may be of more concern for the future. Unless there are contraindications, the restriction of NSAIDs in asthmatic children should be seriously considered, as their omission may hinder postoperative recovery, hospital discharge and lead to escalated opioid use. The benefits of NSAIDs have steadily increased their use. This has also coincided with the availability of newer NSAIDs with fewer side effects and easier routes of administration. HM

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