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EDITORIAL

Asthma therapy: there are guidelines, and then there is real life…

See linked article by Hardwell *et al.* on pg 92

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Modern asthma guidelines such as our UK BTS/SIGN national guidelines[1] inform us that we should aim to control most of our asthma patients near enough perfectly. This control is typically achieved by inhaling medication. While guidelines pontificate at length over the relative effectiveness of inhaled drugs in controlling asthma, they devote less space to dealing with the fact that no inhaled treatment will be effective if it doesn't actually find its way into the airways. Concerned physicians such as the ADMIT team[2] worry about this.

When asthma symptoms do not improve as expected, the health professional should consider five potential causes:

(a) *The patient is not taking his/her medication*. Studies suggest that even overtly compliant patients take only 30-50% of prescribed medication at the correct time.[3,4] One of the commonest reasons is that nobody has sat down with the patient and explained why the treatment is necessary. Other reasons may include poor understanding and motivation, fears about complications, and stressful personal circumstances. The key aim is to empower patients to assume responsibility for their own disease by helping them understand how disease severity can be monitored objectively and what to do about it when they deteriorate. Various tools are available to facilitate this – such as diary cards, lung function charts, and action plans (e.g. from Asthma UK, www.asthma.org.uk). There is abundant evidence that guided management improves health outcomes, but not all patients have the capacity or the inclination to empower themselves.

(b) *The patient is not using his/her inhaler properly*. This problem is staggeringly common and never seems to go away. Inhaler training must be undertaken by seasoned professionals, since more subtle problems with technique which may go unnoticed by the uninitiated can reduce airways delivery of inhaled drugs by as much as 90%. Even when patients cannot use particular devices due to their age, disability or inadequate lung function, errors of technique are frequent.[5] With pressurised metered-dose inhalers (pMDIs), two of the most critical errors are failure to coordinate inhalation with actuation of the device[6] and inhaling the aerosol too quickly.[7] Errors of coordination may be overcome by using a breath-actuated device or a spacer,[6] and rapid inhalation can be improved by training.[7] With dry powder inhalers (DPIs), successful aerosolisation depends on both the velocity and the acceleration of the inhalation manoeuvre, which in turn requires very rapid and very forceful inhalation.[8]

(c) *New exacerbating factors have been overlooked*. Common factors here include passive smoking, occupational sensitisers, drugs (β-blockers, aspirin and other cyclo-oxygenase-1 inhibitors) and exposure to new allergens.

(d) *The patient does not have asthma*. Clear documentation of one or more accepted diagnostic criteria for asthma should be available before any treatment is started (except in young children where a trial of therapy may be the only way to make the diagnosis). If not, and symptoms do not improve as expected after commencing effective anti-asthma medication, it may be appropriate to reconsider the diagnosis.

(e) *There is additional morbidity*. Asthma may be complicated by, or occur in association with, co-morbidities such as bronchiectasis, inhaled foreign body, tracheobronchomalacia, recurrent aspiration, COPD, congestive cardiac failure, tumours

infringing on the central airways, vocal cord dysfunction and obstructive bronchiolitis.

The study by Hardwell *et al*. in this issue of the *Journal*[9] addresses the critical issue of incorrect pMDI technique. A sample of a much larger population was recalled for asthma monitoring, sometimes because of excessive use of rescue medication and sometimes for other reasons. Patients were reviewed by trained asthma nurses according to practice-agreed protocols. Those using pMDIs were assessed using the Vitalograph Aerosol Inhalation Monitor (AIM) which checks three things: firstly, that the patient's inspiratory flow rate is optimal (between 10 and 50 l/min is required for the deposition of aerosolised particles in the airways); secondly, that this flow is maintained for at least 50% of a 3-second period after the flow rate is first attained; and thirdly, that there is a breath hold of at least five seconds at the end of inspiration. This last step is also important for successful airway deposition, particularly with the new HFA-containing aerosols where the particle sizes are much smaller: without a breath hold, they do not settle in the airways and are breathed straight out again. The authors found that a majority (85.6%) of 1291 reviewed patients with symptomatic asthma using pMDIs failed their first AIM assessment. Although the numbers of patients subsequently able to pass the AIM test increased somewhat after problem-directed instruction, 65.7% of those tested and instructed failed the AIM assessment three times. Logistic regression analysis failed to show any effect of age or BTS/SIGN step of treatment on these outcomes.

Like all good studies, the authors' data raises a number of further questions. It is not clear how much training these patients had before attending for the assessment, and because many were selected on the basis of poor asthma control they may have been particularly "poor users". Half of the study patients were aged over 45, raising the possibility that some of them had co-morbidities such as COPD. Finally, the authors provide only limited details as to how the "poor users" were trained. Apart from verbal instruction, other devices such as the 2Tone – a simple but effective whistle which signifies clearly when patients inhale too quickly – are available to teach patients to inhale from pMDIs at the correct speed.[7] Nevertheless, it seems clear that a large proportion of the patients in this study[9] were using pMDIs sub-optimally and were unable to remedy this at least with short-term professional instruction – although one might speculate that longer term instruction with a device such as the 2Tone might have been more fruitful.

The authors did not address DPI devices in this study, but one assumes that if DPI technique had been similarly objectively assessed (such as with a Turbutest[10] or an In-Check Dial device[11]), similar shortcomings would have arisen in some patients. Most patients cannot use DPIs effectively because of limited peak inspiratory flow, which is not particularly remediable with training.

The findings by Hardwell *et al*.[9] would appear to underline the absolute necessity to test pMDI technique objectively (coordination, speed of inhalation and breath holding) at every opportunity in every patient prescribed such a device, and would suggest that manuals and even supervised demonstrations alone are not enough. Of course the study does not suggest a clear remedy for this problem, nor does it assess how far it is potentially remediable or provide any understanding of how far it contributes to poor asthma control in the community. However, one feels inclined to agree with the authors when they conclude that the cost of inhaler devices alone should not be the only factor to determine prescribing when treating asthma. The most expensive inhaler is one which effectively contains nothing because the medication never reaches the target tissue…

Conflict of interest declaration

CJC has received funding to attend meetings and conferences from Schering-Plough, Allergy Therapeutics, Meda AB, UCB Pharma, Novartis, and Teva; has undertaken research collaborations with GSK, Novartis, ALK-Abello, Allergy Therapeutics and Leti; and has acted as a consultant for Meda AB, GSK, Novartis, MSD and Allergopharma Joachim Ganzer AB. He is a member of the ADMIT Group

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