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- 1 Anderson HR. Chronic lung disease in the Papua New Guinea Highlands. *Thorax* 1979;34:647-53.
- 2 Green AB, Brown CD. *Textbook of pulmonary disease*. 2nd ed. London: Silver Books, 1982:49.
- 3 Grey EF. Cystic fibrosis. In: Green AB, Brown CD, eds. *Textbook of pulmonary disease*. London: Silver Books, 1982:349-62.

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The editor and editorial office of *Thorax* have changed

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LETTERS TO THE EDITOR

Effectiveness of four different inhalers in COPD

The conclusion of this evaluation of four different inhalers in patients with chronic obstructive pulmonary disease by van der Palen *et al* (November 1995;50:1183-7) was that "patients using a Diskhaler made fewest errors, whilst most patients using metered dose inhalers made crucial mistakes". The four inhalers assessed in this study were the metered dose inhaler (MDI), the Turbuhaler (Turbuhaler), Diskhaler, and Rotahaler. A checklist for the efficient use of each of the inhalers was devised and for the Diskhaler there was no check on whether or not the patient could load the device. In my experience the greatest difficulty that patients have using a Diskhaler is loading or reloading the device once the four or eight doses have been used.

The authors state that one aspect not investigated was the loading of the Diskhaler and then to state that, because manual dexterity is required, this might cause problems for some patients. They state that this is also true for the Rotahaler, and then infer that this is, in some way, balanced by the fact that, for patients with rheumatoid arthritis, firing the MDI or twisting the Turbuhaler grip might also be difficult.

The Rotahaler checklist included the patient's ability to insert the Rotacap correctly but loading the Diskhaler was omitted. I cannot understand why this extremely important manoeuvre was excluded from the Diskhaler checklist, nor why the authors were then allowed to state that patients using the Diskhaler made fewest errors using this device. The conclusion should, of course, have been that "patients using the Diskhaler made fewest errors after it had been loaded for them". A gun is a useless weapon if you can't load the bullet!

The title of this paper is somewhat misleading since the authors did not assess the effectiveness of different inhalers, but simply assessed whether a group of patients with COPD could use inhalers efficiently as judged by their checklists. No assessment of efficacy of treatment was made. I note that the Keywords do not include effectiveness or efficacy.

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AUTHORS' REPLY We agree in part with Dr Crompton's remarks regarding the omission of a checklist item pertaining to the loading of the Diskhaler with a Rotadisk. To have included such an item would have been the sensible thing to do. However, as you will have noticed, other essential items such as removing the caps of the inhalers were also omitted. Naturally, this is another aspect which will also result in complete failure of the inhalation of the medicine. In an earlier study¹ we included removal of the cap as an item but found no errors.

In this paper we worked on the principle that patients should be physically able to work with the device they are using. If not, failure to use the inhaler correctly is not a matter of not knowing how the inhaler works or the inhaler not being foolproof; it is the result of a judgement error by the physician in

prescribing the wrong inhaler. This last type of error is on a different level and is independent of patient error. If a patient is physically able to insert a Rotadisk into the Diskhaler it can only be done in one way – the correct way.

Although we think that the problem of insufficient dexterity is not major, we can only speculate that, to some extent, a preselection might have occurred – that is, patients who were unable to load a Diskhaler would have received another inhaler. If these patients are also those who would normally make errors in the items on the checklist, then our results may be biased in favour of the Diskhaler. We feel that this is unlikely. Moreover, if patients with, for example, arthritis are unable to insert a Rotadisk in the Diskhaler, will they be able to insert a capsule in a Rotahaler, rotate the grip of the Turbuhaler, or press with enough force to actuate an MDI? This patient should be given another device such as an MDI with a Handygrip. If all else fails, tablets might be the treatment of choice.

In summary, Dr Crompton correctly points out the omission of an essential item. It is of utmost importance to check if a patient is able to load a Diskhaler. We did not include it in our checklists because patients who are not able to do so have been prescribed the wrong inhaler in the first place.

Based on Dr Crompton's remarks we would suggest that the following steps be taken by physicians to prevent errors in inhalation technique:

- Step 1: Determine which kind of medicine the patient needs.
- Step 2: Make an inventory of the different types of inhalers available for this drug.
- Step 3: Determine if a patient is physically able to use a particular inhaler.
- Step 4: Instruct the patient yourself or make sure someone else does it. Do not *think* that someone else will do it.
- Step 5: Check the patient's inhalation technique at the next visit.

If a patient already uses another type of inhaled medication, check the inhalation technique and, if necessary, correct it. If you feel that the device is suitable, do not prescribe another inhaler if this can be avoided.

Try to prescribe as few different types of inhalers per patient as possible.

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- 1 Van der Palen J, Klein JJ, Kerkhoff AHM. Poor inhalation technique by patients with chronic bronchitis/emphysema (Dutch). *Nether J Med* 1994;138:1417-22.

BOOK NOTICE

Non-Biological Particles and Health. Department of Health: Committee on the Medical Effects of Air Pollutants. (Pp 141; £18.00). Norwich, UK: HMSO Books, 1995. 0-11-321952-0.

This is a report produced by the Committee on the Medical Effects of Air Pollutants set up by the Department of Health. A subgroup of the Committee reviewed all the available information on levels of particulate air pollution in the United Kingdom and the evidence available from epidemiological studies, conducted mainly in other countries, regarding the likely effects of such pollution on health. The group also reviewed evidence regarding the likely mechanisms of the effect of such particles.

The report is the most comprehensive review of the evidence currently available. In recent years there has been increasing interest in the role of particulates and it appears that they are probably more important than gases in causing adverse effects upon health. Although airborne particle concentrations in the UK are lower than were present in the 1950s and 1960s, their nature has changed with the reduction in use of coal and increasing use of diesel fuel which results in emission of finer black particles than were produced by coal burning. There is a large base of data concerning levels of particulates in UK urban air, although different methods of measurement have complicated matters.

Two major classes of health effects are considered – acute and chronic. The report concludes that it is well established that people with pre-existing respiratory and/or cardiac disorders are at risk of acute effects reflected in indicators such as day to day variations in mortality, hospital admissions, emergency room visits, time off school or work, respiratory symptoms, exacerbations of asthma, and changes in lung function. There is no clear indication that effects on health are restricted to specific types of particles and those from motor vehicles and industrial sources are implicated.

In the UK there has been a long established association between chronic bronchitis and exposure to particulates and sulphur dioxide resulting from coal burning. Disentangling the roles of these agents and various other factors, particularly smoking, has been difficult. The Six Cities study in the USA has followed populations in six cities with differing levels of air pollution for 14–16 years and has shown excess mortality from cardio-pulmonary disease to be more closely associated with particulates than with other pollutants. Several studies from Europe and the USA have demonstrated increased respiratory symptoms and decrements in lung function associated with increased particulate levels. However, data on chronic effects remain inadequate and the report concludes with recommendations for further research.

This report will be essential reading for all those interested in the effects of air pollution upon respiratory health. The price is modest and many will consider it a worthwhile addition to their own bookshelf. – RMR

NOTICE

4th International Conference on Small Cell Lung Cancer

The 4th International Conference on Small Cell Lung Cancer will take place in Ravenna, Italy on 25–26 April 1996. For further information please contact Nadia Colaiuda, Augustea Srl, Via di Roma 86, 48100 Ravenna, Italy. Tel. +39-544-216313. Fax. +39-544-216270.