

## 75 Deaths in asthmatics prescribed home nebulisers

SIR,—Like Dr M R Sears and coworkers (21 February, p 477), we are concerned about the possible toxicity of high doses of bronchodilators delivered by nebulisers in patients with asthma who are also hypoxic and may be hypokalaemic.

We studied 10 patients with asthma, mean age 38.5 years, who were admitted to hospital with an acute exacerbation of their asthma. They were treated conventionally with intravenous and oral corticosteroids, nebulised salbutamol and ipratropium bromide, oxygen, and intravenous and oral theophylline if required. They were studied during the recovery period and on two consecutive days at 9 am, when salbutamol and ipratropium bromide nebuliser solutions were administered in random order using a Cirrus nebuliser driven by air at a flow rate of 8 l/min. Salbutamol was given in a total dose of 10 mg diluted in normal saline and ipratropium bromide in a total dose of 500 µg diluted in normal saline. Oxygen saturation was measured continuously using a Biox IIA ear oximeter, plasma potassium concentration was sampled, and continuous electrocardiographic recording was performed.

There was no evidence of a carryover effect, and we therefore compared the individual day effect, using Student's *t* test, to see if there was any significant difference from baseline. There was a non-significant maximum fall in the mean (SD) plasma potassium concentration of 0.08 (0.29) mmol/l with salbutamol from a baseline of 3.74 (0.35) mmol/l and a non-significant rise in plasma potassium concentration of 0.15 (0.30) mmol/l with ipratropium bromide from a baseline of 3.64 (0.17) mmol/l. There was a significant fall in oxygen saturation with salbutamol ( $p < 0.002$ ) of 2.30 (1.64)% from a baseline of 94.7 (2.45)% and a fall with ipratropium bromide ( $p < 0.005$ ) in oxygen saturation of 1.80 (1.55)% from a baseline of 94.1 (2.25)%. None of these changes in potassium or oxygen saturation were likely to be clinically important. The only cardiac arrhythmias during the four hour period either side of the nebulisation were ventricular ectopic beats. For all the patients there was a total of 24 ventricular ectopic beats before salbutamol and 14 after and with ipratropium bromide 16 before and six after.

Our study suggests that 10 mg of salbutamol or 500 µg of ipratropium bromide, delivered with an air driven nebuliser, has no clinically important effect on oxygen saturation, plasma potassium, or cardiac rhythm in patients recovering from asthmatic attacks.

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## Asthma mortality: comparison between New Zealand and England

SIR,—In my letter of 3 January (p 53) I expressed doubts on the validity of a comparison of asthma mortality<sup>1</sup> in a New Zealand study<sup>2</sup> and an English one,<sup>3</sup> which Dr M R Sears and Dr H H Rea have not convincingly resolved (7 March, p 646). I also postulated that annual mortality figures for all races in the 5-34 age group, such as those presented in an earlier article,<sup>4</sup> might have exaggerated the severity of the recent "epidemic" of asthma deaths among caucasian subjects, since these figures included non-caucasians, in whom the death rate was known to be much higher; no fewer than 48%

of all deaths in the 5-34 age group in 1981-3 were of non-caucasians,<sup>2</sup> although they constituted only 10.9% of its population.

I used an incorrect figure of 15% for the non-caucasian population and also wrongly assumed that the proportion of non-caucasian deaths in the 5-34 age group had been similar each year from 1975 onwards to what it was in 1981-3. Correction of the first error actually strengthened my case, but the statement by Drs Sears and Rea that the non-caucasian death rate fell from 48% to 16% of the total death rate between 1981-3 and 1985 unexpectedly undermined my second assumption. The only possible explanation of this sudden change, seemingly statistically significant, is either that the treatment of non-caucasians improved dramatically over two to three years or that their asthma miraculously diminished in severity.

I agree unreservedly with Dr Sears and Dr Rea that inappropriate treatment and delays in seeking and receiving medical help are the most important contributory factors in deaths from asthma. That conclusion has no doubt been valid ever since the disease was first recognised, and there must be a more specific reason for the "epidemics" of asthma deaths in the United Kingdom and several other countries in the 1960s and in New Zealand in the 1980s. Such epidemics have not been recorded previously in the centuries old history of the disease, yet they have now occurred twice in only 20 years. Dr Sears and Dr Rea warn against assuming that the second New Zealand epidemic was a rerun of the 1960s epidemic, but the onus is on them to prove it was not. The time scales of the two epidemics were so similar that any other hypothesis is scarcely credible.

The 1960s epidemic in the United Kingdom followed the introduction of a symptomatically effective, patient controlled form of treatment (with pressurised isoprenaline inhalers), which is not intrinsically dangerous but which may have altered the pattern of medical supervision so that both patients and general practitioners underestimated the risk of a fatal outcome. That epidemic subsided almost certainly not because of restrictions placed on the supply of isoprenaline inhalers but because the alarm sparked off by a government warning on their supposed dangers resulted in a vast increase in prescriptions for oral corticosteroids and in the number of patients with acute asthma admitted to hospital.

In 1982, when the second epidemic in New Zealand was at its height, it was estimated that 6000 nebulisers for the delivery of high doses of bronchodilator aerosols in the home had been procured in the previous two years by private purchase or as gifts from charitable bodies.<sup>5</sup> Bronchodilator solutions were available either without prescription or because general practitioners were reluctant to withhold them from patients with nebulisers. After nationwide publicity on the dangers and restrictions on the supply of bronchodilator solutions in late 1982 mortality from asthma began to fall and is now almost back to the pre-epidemic level, although still higher than that in other countries.

In their article on home nebulisers (21 February, p 477) Dr Sears and colleagues claim again that overreliance on a home nebuliser was a factor in, at most, 8% of fatal cases. An equally reassuring claim could probably have been made about pressurised isoprenaline inhalers in the 1960s. Although the temporarily uncontrolled availability of both forms of treatment may have been directly responsible for only a relatively small number of deaths, their very introduction and perceived efficacy could ipso facto have led to a diminished awareness of the risk of death from asthma and thus of delays in starting systemic corticosteroid therapy or admitting patients to hospital.

High dose  $\beta_2$  agonist aerosols delivered by nebulisers are both effective and safe provided that treatment is carefully controlled and monitored and is not allowed to tempt patients to delay seeking medical help or doctors to delay in starting corticosteroid treatment.

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- 1 Sears MR, Rea HH, Rothwell RPG, *et al.* Asthma mortality: comparison between New Zealand and England. *Br Med J* 1986;293:1342-5.
- 2 Sears MR, Rea HH, Beaglehole R, *et al.* Asthma mortality in New Zealand: a two-year national study. *NZ Med J* 1985;98:271-5.
- 3 British Thoracic Association. Deaths from asthma in two regions in England. *Br Med J* 1982;285:1251-5.
- 4 Jackson RT, Beaglehole R, Rea HH, Sutherland DC. Mortality from asthma: a new epidemic in New Zealand. *Br Med J* 1982;285:771-4.
- 5 O'Donnell TV. Home nebulisers for asthmatics. *NZ Med J* 1982;95:637.

## An uncompromising report on health visiting for the elderly

SIR,—It is refreshing to see the Health Visitors' Association confirming its responsibilities to the elderly as well as to children, and its recent report in conjunction with the British Geriatrics Society is to be welcomed.<sup>1</sup> Certain conclusions in this report, however, and Dr Simon Barley's comments on them (7 March, p 595) give cause for concern.

The benefit of health visitors' case finding or screening of the elderly population remains unproved.<sup>2</sup> A reduction in mortality has been claimed, but results from controlled trials are inconclusive. Vetter *et al* found a difference in the number of deaths between a screened group and only one of two control groups.<sup>3</sup> Tulloch and Moore, on the other hand, found significantly more patients in their screened population who were free of medical disorders or suffering from only one condition at the end of a two year study.<sup>4</sup> There were more patients with two disorders, however, in the study group, and this pattern was repeated for those with three or more conditions, but the differences were not significant. No significant improvement in functional state has been observed.

Though most investigators believe that their patients benefit from regular contact with a health visitor, such subjective impressions have not been confirmed by more sophisticated measurements.<sup>5</sup> Screening does, however, seem to reduce the number of elderly patients admitted to institutions, and two studies have shown a reduction in the number of admissions to hospital and the number of hospital bed days utilised.<sup>4,6</sup> Nevertheless, referrals for hospital clinic attendance may increase, and some uncontrolled screening programmes in the United States have reported increased inpatient referral rates. Prevention of admission to hospital seems to depend on the skills of each health worker in acting as a gatekeeper for inpatient resources.

Caution should be exercised before large scale funding is provided for an approach to health care whose benefit has not been proved. Opportunistic case finding may offer an equally effective but more economical means of health maintenance in the elderly in Britain, where most have at least yearly contact with the primary care team.

In the current restrictive economic climate it is insufficient even to prove that a health maintenance strategy is effective. Its value, as judged by the health workers and the population concerned, must be compared with alternative strategies. Many of the needs of the elderly revolve around surveillance, personal care tasks, and companionship. Instead of using highly trained staff to meet only one of these needs, would it not be better to meet all the needs of the elderly by providing more contact with a less comprehensively trained care attendant?

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- 1 British Geriatrics Society and the Health Visitors' Association. *Health visiting for the health of the aged: a joint policy statement.* London: British Geriatrics Society/Health Visitors' Association, 1986.