Correspondence

Nebulisers—uses and abuses

Sir,

Although I read the annotation on nebulisers by Drs Newman and Clarke¹ with considerable interest, I would like to make two critical comments.

Firstly, although they are right to emphasise the need for careful education to ensure the children do not place too much reliance on their nebulisers and delay seeking medical advice when their asthma is deteriorating, they fail to point out how useful a nebuliser can be in monitoring the progress of an attack. Parents are often reluctant to contact their general practitioner or take their child to the accident and emergency department unnecessarily and often ask for guidance on assessment of asthma severity. This can be provided by observing the child's response to inhaled beta₂ stimulants. If the child is dramatically or considerably relieved for at least two to three hours it is reasonable for the child to continue on his current treatment. If, however, the treatment with nebuliser fails to produce a considerable improvement or the child deteriorates within one to two hours then further help is urgently required.

My second point is that the authors claim that the doses delivered by nebulisers are large, assuming that all the active ingredient placed in the nebuliser is inhaled by the child. We know, of course, that this is untrue; at least ½ ml—that is, 25%—will remain in the nebuliser in droplet form. We also know that as the nebuliser is discharging throughout the respiratory cycle it is unlikely that even 25% of the remaining dose will penetrate the child's nose or mouth. Thus the dose reaching the lungs is likely to be in the region of 50 to 100 µg and not 250 to 500 µg as quoted in their paper. This is, of course, a trivial dose compared with that taken by many children in syrup or tablet form with complete safety.

Reference

- ¹ Newman SP, Clarke SW. Nebulisers—uses and abuses. *Arch Dis Child* 1986;**61**:424–5.

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Dr Clarke comments:

Dr Milner's letter in response to our annotation makes two points. The first is that we failed to point out how useful a nebuliser can be in monitoring the progress of an attack and I am not sure the annotation was addressed to that specific aspect.

The second concerns the dose delivered by nebulisers.

Approximately 10% of the dose placed in a nebuliser reaches the lungs and this we stated quite clearly, basing this figure on our measurements using radiolabelling techniques. For example, 2.5–5 mg of a bronchodilator liquid placed in a nebuliser would give on average approximately 250–500 µg in the lungs. This amount is only 10% of the original, partly because of the very factors that you mention—namely, some drug remains in the nebuliser and that inhaled by the patient is only during the inspiratory phase of the breathing cycle. It is quite invalid, however, to invoke the same factors to reduce the estimated drug delivery again by a factor of five to 50–100 µg. Furthermore, we certainly have not assumed that all the drug placed in the nebuliser is inhaled, either in our annotation or elsewhere. Of course there are other factors that may reduce the lung dose further, such as inefficient apparatus, large droplets that deposit in the mouth, a short nebulisation time, and patients using a mouthpiece but inhaling through the nose. These points merely emphasise the need to use nebulisers in a precise and efficient manner.

Nebulised pain relief for children

Sir,

I read your editorial on nebulisers with interest.¹ Sadly, there is no explanation given for their popularity with patients, which must in part be due to the fact that nebulisers give rapid effective relief of distressing respiratory symptoms without recourse to the needle. Children, like adults, dislike injections.

Other medications could similarly be given this way. For example, I have carried out research on adult volunteers and found that nebulisers can provide fast and effective relief of pain using morphine² and preferably diamorphine. (Masters NJ. Unpublished findings.) This use might be of value in paediatric casualty departments where in shocked patients intramuscular injections have poor absorption and intravenous delivery may be technically difficult to achieve. Could this warrant further study?

References

- ¹ Newman SP, Clarke SW. Nebulisers: uses and abuses. *Arch Dis Child* 1986;**61**:424–5.
² Masters NJ, Bennett MRD, Wedley JR. Nebulised morphine: a new delivery method for pain relief. *Practitioner* 1985;**229**:649–53.

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