

Correspondence

Nebulised pentamidine as treatment for *Pneumocystis carinii* pneumonia in the acquired immunodeficiency syndrome

SIR,—Dr Miller and his colleagues (July 1989;44:565-9) report that nebulised pentamidine when delivered by a Respigard II nebuliser is more effective in the treatment of *Pneumocystis carinii* pneumonia than when delivered by an Acorn nebuliser.

They state, however, that the mass median aerodynamic diameter (MMAD) of the aerosol produced by the Acorn is 2.6 μm . This means that 50% of the aerosol mass is contained in droplets of less than 2.6 μm and 50% of the aerosol mass is contained in droplets of 2.6 μm or more. It is therefore a physical impossibility for 46% of the particles to be less than 3.9 μm , as the authors state. If this latter figure is correct, then the MMAD of the aerosol must be 3.9 μm or more. The correct size of the aerosol is critical to the interpretation of this study. Newman and colleagues have shown that the MMAD of the Acorn nebuliser, when measured in the same manner, ranges from 4.5 to 5.7 μm .¹ It seems likely that Dr Miller and his colleagues have miscalculated the MMAD.

Only one patient from the group treated by Acorn nebulisers was seen to have oozing and contact bleeding at bronchoscopy, whereas four patients from the Respigard group, which delivers a smaller droplet aerosol, were noted to have these findings. It is therefore difficult to implicate the pentamidine as the cause of these abnormalities, as the larger aerosol (delivered by the Acorn nebuliser) would be expected to produce a greater upper airway deposition, and so cause more rather than less mucosal irritation. Moreover, the authors state that the diagnosis of pneumocystis pneumonia was made by bronchoscopy before pentamidine was started (with the exception of one patient treated empirically). How is it then possible for the nebulised pentamidine to have caused the mucosal friability attributed to it?

QUENTIN SUMMERS

Immunopharmacology Group
Medicine 1
Southampton General Hospital
Southampton SO9 4XY

of 8 l/min we obtained an MMAD of 2.1 μm and GSD of 2.9 with saline, and an MMAD of 2.6 μm and GSD of 2.9 with pentamidine (100 mg/ml). The group quoted by Dr Summers report that an Acorn nebuliser running at 8 l/min nebulising saline produces an MMAD of 2.3 μm and not 4.5-5.7 μm .¹

We report four patients from group 2 with bronchial oozing and a further patient with bronchial oozing and haemoptysis and in group 1 two patients with ooze and a further patient with ooze and haemoptysis. Unfortunately, with editorial pruning details of the bronchial bleeding have been lost. We in fact described bronchial oozing as the bronchoscope was being positioned in peripheral bronchi before bronchoalveolar lavage.² In the patients in whom we reported bronchial bleeding pentamidine had been started pending the bronchoscopic result. At the time of bronchoscopy one patient had received six doses of pentamidine, two patients four doses, one patient two doses, and a further patient a single dose of pentamidine (group 2 patients). In group 1 patients one patient had received three doses, one two doses, and one a single dose of pentamidine at the time of bronchoscopy. Our explanation for this apparent difference in incidence of side effects is that possibly the Acorn, because of the greater heterodispersity of aerosol droplets, in fact enables a smaller proportion of the delivered dose to reach the peripheral airways and so cause the local toxic effect.

RF MILLER

Department of Medicine
University College and Middlesex School of Medicine
Middlesex Hospital
London W1N 8AA

1 Clay MM, Pavia D, Newman SP, Clark SW. Factors influencing the size distribution of aerosols from jet nebulisers. *Thorax* 1983;38:755-9.

2 Miller RF, Semple SJG. Bronchial bleeding with nebulised pentamidine. *Lancet* 1988;ii:1488.

Antibodies to neutrophil cytoplasmic antigens in Wegener's granulomatosis and other conditions

SIR,—I read the excellent article by Dr DJ Harrison and colleagues (May 1989;44:373-7) with interest, but would question whether the quoted sensitivity of their neutrophil autoantibody test for Wegener's granulomatosis is the most appropriate one to choose.

The terms sensitivity and specificity of a diagnostic test were introduced by Jacob Yerushalmi¹ in an epidemiological setting when the diagnosis of the patient was known and the accuracy of the test was evaluated in retrospect. This type of sensitivity and specificity, subsequently called nosological,² is of limited direct value in diagnosis when the patient presents with a finding or group of findings and the test is used to help confirm or exclude a diagnosis.^{2,3} In these circumstances the diagnostic specificity (positive predictive value) and sensitivity (negative predictive value) are more appropriate. When the test is applied in clinical practice these values can be

1 Newman SP, Pellow PGD, Clarke SW. Droplet size distributions of nebulised aerosols for inhalation therapy. *Clin Phys Physiol Meas* 1986;7:139-46.

AUTHOR'S REPLY

We are grateful to Dr Summers for pointing out a typographical error in our manuscript. As he points out, it is physically impossible for the droplet dispersion to be as described. In fact 64.5% and not 46.5% of the droplets were less than 3.9 μm . We believe that our calculations of the MMAD are correct. Using the Acorn nebuliser at a flow rate