

Letters to the Editor

Dear Editor

Problems encountered using nebulized medications in hospitals

We read with interest the recent paper in *Respiratory Medicine* by Caldwell and Milroy highlighting some of the problems encountered using nebulized medications in hospitals (1). While their paper concentrated mainly on the use of nebulized bronchodilators, nebulized antimicrobials are increasingly used in the treatment of chronic pulmonary infection and for prophylaxis. We recently conducted a survey of the use of nebulized antimicrobial agents within the West Midlands to estimate how frequently these agents are used in clinical practice, how well defined their use is, and how well health and safety issues arising from their use are addressed. At present not all are licensed for this use or produced in a formulation specifically for use with nebulizers. In addition, a number are recognized respiratory sensitizers and some may have other adverse health effects (2–5). Thus, through inadequate guidance and poor practice when using nebulized antimicrobial agents, there is potential for less than optimal treatment being given to patients, and at the same time some risk of adverse effects to staff and others.

A postal questionnaire was sent to all consultant physicians, paediatricians, and geriatricians employed by West Midlands Regional Health

Authority at 1 January 1993 seeking information about inpatient and outpatient prescription of nebulized antimicrobial drugs within the past year (1992–1993).

Consultants provided information on agents used, the number of patients treated, number of treatment courses, and usual dose prescribed. Details were also sought on whether nebulizer type and flow rate were specified, and any exhaust filter or local exhaust ventilation used.

Two hundred and ninety-five questionnaires were sent and 226 returned (76%). Of those who replied, 20 of 129 physicians (16%), 15 of 64 paediatricians (23%), and one of 33 geriatricians (3%) had used nebulized antimicrobial agents in the past year (Table 1). Colistin, pentamidine, amoxycillin, and gentamicin had been used for both inpatients and outpatients, ribavirin and netilmicin had been used for inpatients, and carbenicillin and tobramycin had been used for outpatients. The maximum number of agents prescribed by any consultant was five. Colistin was the agent prescribed by the largest number of consultants. Ribavirin and pentamidine were the next most commonly prescribed. Prescribed dosages for colistin were found to vary widely (250 000 to 2 000 000 units per nebulization for adults) but dosages of other drugs were less variable.

Most consultants specified a nebulizer type, and most either specified a flow rate or used a fixed rate

Table 1 Use of nebulized antimicrobial agents by consultants in the West Midlands Region

	Number prescribing (%)	Nebulizer type specified	Flow specified	Exhaust used
		(% prescribing)		
Physicians (129)				
inpatients	13 (10)	9 (69)	11 (65)	9 (69)
outpatients	17 (13)	14 (82)	16 (94)	12 (71)
Paediatricians (64)				
inpatients	13 (20)	11 (85)	9 (69)	5 (38)
outpatients	9 (14)	8 (89)	8 (89)	4 (44)
Geriatricians (33)				
inpatients	1 (3)	0 (0)	1 (100)	0 (0)
outpatients	0 (0)			
All consultants (226)				
inpatients	27 (12)	20 (74)	21 (78)	14 (52)
outpatients	26 (12)	22 (85)	24 (92)	16 (62)

compressor. A smaller proportion specified the use of an exhaust device. Ribavirin and colistin were used most frequently without an exhaust device. Only one of seven consultants used pentamidine without an exhaust device. All these drugs were given on occasions without any exhaust device being used.

Thus, nebulized antimicrobial agents had been prescribed by a significant proportion of consultant physicians and paediatricians, but by fewer geriatricians. This use potentially exposes hospital staff, patients, visitors, and home carers to health risks caused by waste aerosol, and possibly an increased risk of infection (3–6). Dosages prescribed for colistin, the drug most commonly used in this way, varied eight-fold, but the doses of other agents used seem to be more standardized.

Unnecessary exposure of health care staff to waste aerosol could be reduced by the wider use of exhaust devices, but simple measures such as regular checks of equipment connections and seals, and use of separate treatment rooms should not be overlooked.

In addition it would seem sensible that manufacturers and clinicians should recognize that these agents are sometimes used in unlicensed ways, collaborate to produce formulations for use in nebulizers, and specify appropriate treatment regimes and safety precautions.

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Dear Editor

Cattle TB: 'VL, open' cases . . . or 'NVL, non-infectious' cases?

There seem to be two schools of thought on the issue of cattle TB, and yet it is one of critical

importance in tackling the final stages of tuberculosis eradication schemes. On the one hand it is claimed that only cattle with gross 'visible lesions' (VL) at abattoir inspection are capable of passing TB on to other cattle (1–4).

This view is not substantiated by other studies of cattle aetiology and pathogenesis. Most TB in adult cattle starts as a lung infection of respiratory aereogenous derivation via aerosolized 'sputum' or dust. Primary lesions may heal, but more usually they remain 'open', and may remain subclinically latent, or progress to chronic, or fatal and acute bronchopneumonia. Even where an apparent 'sealed tubercle' develops, it would seem that intracanalicular bronchiolar spread continues, such that intermittent or continuous bacterial shedding occurs in the 'sputum'. Even cattle with micro-lesions that would be missed at gross abattoir inspection are infectious to other cattle despite being 'non-visibly-lesioned' (NVL) in the lungs, or VL only in broncho-mediastinal lymph nodes. Such cattle will be producing infectious faeces via swallowed 'sputum' (5–9). Surely it is the case that the number of cattle with TB in a herd merely reflects the period elapsed since the last 'clear' test, NVL or otherwise, there is spread to contiguous herds, and slurry is infectious? Pigs, other stock and badgers might catch TB from even NVL herds?

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