Although there is little doubt that the response of young infants to bronchodilators is less good than that of older children, I think that in the acute stage a substantial number of them do benefit and it is worth a trial.

References

- König, P. (1978). Treatment of severe attacks of asthma in children with nebulised B_2 adrenergic agents. *Annals of Allergy*, **40**, 185-188.
- Radford, M. (1975). Effect of salbutamol in infants with wheezy bronchitis. *Archives of Disease in Childhood*, **50**, 535-538.
- Rutter, M., Milner, A. D., and Hiller, E. J. (1975). Effect of bronchodilators on respiratory resistance in infants and young children with bronchiolitis and wheezy bronchitis. *Archives of Disease in Childhood*, **50**, 719-722.

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Dr Milner and co-workers comment:

We were interested to hear of Dr König's experience with nebulised salbutamol in children under one year. We accept that all our studies were carried out during the recovery phase but we have not found that any child under one year has obtained any useful, clinical benefit from nebulised salbutamol when administered in the acute phase. Since our paper was published, two children between the ages of 12 and 18 months have responded well, and we have since heard of another who apparently obtained benefit by age 11 months. We still recommend that salbutamol be given to all wheezing children over one year but think it unlikely that many children younger than this will respond to this form of treatment.

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Intrathecal ATS and high dosage diazepam in neonatal tetanus

Sir,

We should like to make a few comments about the report by Khoo *et al.* (*Archives*, 1978, **53**, 737). Seven of the 19 neonates studied required total paralysis with IPPV for uncontrolled spasms, 2 died, and 5 more might have died but for total paralysis and IPPV. Therefore, it is not justified to say that improved survival was due to administration of high doses of diazepam alone.

Recently we initiated a study on the efficacy of a regimen consisting of intrathecal administration of anti-tetanus serum (ATS), and high doses of diazepam (15-30 mg/kg per day) and chlorpromazine (15-30 mg/kg per day) intravenously.

Between July and October 1978, we studied 10 neonates (Table). Diagnosis was on clinical grounds, and severity was graded using the criteria of Patel and Joag (1959). Immediately after admission an IV line was established and diazepam administered at the rate of 1 mg/kg per minute until the infant was free of spasm and rigidity. This was followed by administration of ATS, 250 IU intrathecally, and 1500 IU IV. Penicillin and gentamicin (5 mg/kg per day) were given. Infants were nursed in the paediatric ward. The umbilical cord was cleaned with spirit, and painted with gentian violet routinely. Pharyngeal suction was done at regular intervals.

Subsequent muscle relaxation was achieved by alternate IV administration of 2.5-7.5 mg diazepam and chlorpromazine, each at 2-4 hourly intervals (total daily dose of each drug 15-30 mg/kg). Once spasms had been controlled, a nasogastric tube was inserted for feeding and giving diazepam and chlorpromazine. Sedation was gradually tapered off at a rate of 10-15% of total dose administered at intervals of 1-2 days, depending on the degree of hypertonia. None of the infants was given IPPV with total paralysis.

Eight neonates recovered completely and 2 died, one of fulminant bronchopneumonia and the other with aspirant pneumonia. The average duration in hospital for the survivors was 20 days, and the average period for IV diazepam and chlorpromazine 3.4 days. We observed that the shorter the interval between the onset of the tetanus neonatorum and the intrathecal ATS, the quicker

Table The 10 neonates* studied

Case	Gestational weight (kg)	Age at onset (days)	Instrument for cord cutting	Grade	Spasm controlled (hours)	Duration of sedation (days)	Hospital (days)	Outcome
1	2.8	6	Blade	V	48	20	30	Recovered
2	2.6	6	Blade	V	48	7	13	Recovered
3	2.7	5	Razor	V	9 days	25	25	Recovered
4	3.0	9	Scissors	IV	24	12	12	Recovered
5	2.0	5	Scissors	V	Not controlled	—	—	Died 50 hours after being admitted
6	2.4	7	—	V	36	9	10	Recovered
7	2.1	6	Kitchen knife	V	Not controlled	—	—	Died
8	2.8	7	—	V	72	19	20	Recovered
9	3.0	7	—	V	48	10	11	Recovered
10	2.7	6	Blade	V	120	30	40	Recovered

*All were term except for Cases 5 and 6.