

## PAPERS AND ORIGINALS

**Arrangements for special and intensive care of the newborn**

EVA ALBERMAN, JULIA COLLINGWOOD, P O D PHAROAH, JANE VAIZEY, T E OPPÉ

*British Medical Journal*, 1977, 2, 1045-1047**Summary**

All the special care baby units in three Thames health regions completed a one-day census on the number of infants in the unit, staffing, and facilities. The results were assessed in the light of the recommendations of an expert group set up by the Department of Health and Social Security. Although the provision of cots (6.1-6.9 per 1000 live births) was more generous than the estimated need and the occupancy rate (59-63%) lower than suggested, some units did not have adequate trained nursing cover at night, some did not have resident paediatricians, and some lacked essential equipment. Some small units, on the other hand, had very expensive equipment that was probably underused.

Relating this provision to the regional statistics on babies needing special care showed that there was room for the rationalisation of facilities for their care. Factors that should be considered in planning such care include the size of the child-bearing population, the percentage of infants of low birth weights, and the proximity of specialist paediatric and maternity units and pathology facilities. It is also essential to monitor the effectiveness of the care by assessing the outcome in babies admitted to special units, especially those of low birth weight.

**Introduction**

Evidence is accumulating that the quality of care given to infants, particularly those of low birth weight, during the first

few days of life is crucial in determining the eventual outcome.<sup>1-3</sup> Not only is mortality improved but there are fewer handicaps among the survivors. Because of these improvements a working party convened to report on the prevention of early neonatal mortality and morbidity recommended that, "Health authorities should review, as a matter of urgency, the arrangements for special care including intensive care of the newborn."<sup>4</sup> The Expert Group on Special Care for Babies<sup>5</sup> made recommendations on the staffing, size, equipment, and level of cot provision of special care baby units which should be a yardstick for health authorities.

One-day censuses were recently carried out in special care baby units in three of the Thames health regions. The findings provided us with an opportunity to review the current arrangements for special baby care in a population of about 11 million in the light of the recommendations of the expert group. We attempted to evaluate the effectiveness of the care given and to suggest how effectiveness may be monitored at all levels of the health service.

**Methods**

A one-day census by questionnaire was conducted in special and intensive care baby units run by the South-east, North-east, and North-west Thames Regional Health Authorities (RHAs).

The questionnaire was in three parts. The first part concerned the number of babies in the unit at 12 noon on the day of the census together with details of birth weight; gestational age; date, time, and place of delivery; and date and time of admission to the unit. The second part related to staffing. The units were asked to enclose the nursing duty rota for the week of the survey together with details of the training grades of the nurses on the rota and their experience in special care baby units. It also inquired into the number of doctors of each grade who were on call over the 24 hours of the census and whether they were resident in the hospital or from where they came at night. The final part provided a check list of equipment and pathology facilities. The units were asked to state which of these were available.

The censuses were conducted in a different year in each region.

**Results and comment****SIZE AND STAFF**

For statistical purposes a special care baby unit was defined as "one under the control of a consultant paediatrician and with staff

Department of Community Health, London School of Hygiene and Tropical Medicine, London WC1E 7HT

EVA ALBERMAN, MD, reader in child health  
JULIA COLLINGWOOD, BSC, research worker  
P O D PHAROAH, MD, senior lecturer

Department of Paediatrics, St Mary's Hospital Medical School, London W2

JANE VAIZEY, MRCP, honorary senior registrar  
T E OPPÉ, FRCP, professor

specially allocated to it.<sup>26</sup> Regional statistical reports compiled from form SH3 showed a total of 68 units in the three regions. Further inquiry, however, showed that eight neither fulfilled our criteria nor functioned as special care baby units. These were excluded from the survey. Two others, though excluded from regional statistics, nevertheless fulfilled the criteria and were considered by the consultant paediatricians to be functioning as special care units. They were included. Thus, there were 62 units in the three regions that satisfied the definition and functioned as specialist units. All except one participated in the census.

Table I shows that the provision of cots per 1000 live births was more generous and the occupancy rate lower than the expert group's estimated requirement of 6.0 cots per 1000 at an assumed occupancy rate of 70-75%.

TABLE I—Cot provision in special care baby units

Region	No of live births	No of cots	Cots 1000 live births	% Occupancy
South-east Thames (1974)	44 348	272	6.1	61.4
North-west Thames (1975)	45 509	308	6.8	62.7
North-east Thames (1976)	47 126	327	6.9	59.6

One of the recommendations of the expert group was that special care baby units should contain at least 24 cots. This followed a recommendation made in 1961 that there should be at least 20 cots per unit.<sup>7</sup> But only three of the 62 units in the three regions had 24 or more cots (table II).

TABLE II—Size of special care baby units

Region	No of units with:					Total units
	<10 cots	10-14 cots	15-19 cots	20-23 cots	≥24 cots	
South-east Thames (1974)	7	6	5	2	1	21
North-west Thames (1975)	2	7	6	4	1	20
North-east Thames (1976)	0	7	9	4	1	21

The group also stated that the special units should be provided in district general hospitals that have specialist maternity and children's departments. All but one of the 62 units were in the same hospital as a specialist maternity department but 19 were in hospitals with no children's department other than cots for neonatal or special care. Perhaps more surprising, nine units were without resident paediatric staff.

The expert group recommended that in any special care nursery two experienced nurses able to resuscitate by bag or mask or by endotracheal intubation should be on duty in each shift. "Experienced" was defined as having worked under supervision in a special care nursery unit for at least two months. Although nursing duty rotas were available for the week of the census, there were considerable problems in assessing the staffing ratios of the units in the study because the presence of pupil midwives or other nurses undergoing training could virtually double the official staffing establishment. Furthermore, with the very low occupancy in some units, the nurse:cot ratio was a poor measure of the nursing care available per baby. We therefore picked two aspects to gauge nursing provision.

Firstly, each unit was asked whether the nurses would undertake endotracheal intubation if necessary. Only 43 of the 61 answers were in the affirmative and several units commented that only the sister in charge would do so in an emergency. Secondly, we considered the number and experience of the nurses on night duty, for at night there is a drop both in the numbers on duty and in the proportion who are trained and experienced. Of the 56 units who provided details of staff on duty on the night before the census, eight had no trained staff and four had no "experienced" staff.

EQUIPMENT

Table III summarises the equipment available to the units. Two general points can be made about these findings. Firstly, some units still lacked equipment that might be regarded as essential; in particu-

TABLE III—Equipment in 62 units\*

	Yes	No	No reply
Hand ventilator	42	14	6
Mechanical ventilator	39	18	5
Continuous positive airway pressure apparatus	39	19	4
Blood gas analyser	26	32	4
Blood chemistry analysing equipment (including Dextrostix)	48	13	1
Apnoea alarm	60	1	1
Heart rate monitor	40	18	4
Phototherapy unit	56	4	2
O <sub>2</sub> analyser for incubators	61	0	1
Intravenous infusion pump	44	16	2
Overhead radiant heater	39	17	6
Piped oxygen	53	6	3
Piped suction	34	23	5

\*One unit did not participate in the census and so provided no reply to any of these questions.

lar, five units apparently had no facilities for ventilation. On the other hand, and perhaps paradoxically, many small units had very expensive equipment which was probably not often used in view of the fact that extremely small or sick babies were rarely admitted.

TYPE OF BABY RECEIVING SPECIAL CARE

Annual statistics indicate that there are about 375 infants born every 24 hours in the three regions. At the time of the census 48 infants had been admitted to the special care baby units in the preceding 24 hours. Thus about 13% of infants were admitted to the units—a figure that is nearer to the minimum estimate of the expert group and close to that described in the 1970 British Births Survey.<sup>8</sup>

The census "cross-sectional" type of investigation gives a different view of babies receiving special care to that provided by a study of admission to special care baby units because of the disproportionate representation of very ill infants or those of low birth weight with prolonged stays. Table IV shows the birth weight by length of gestation of infants in the units on census day. Although 66% weighed 2500 g or less at birth, only 19 (40%) of the 48 babies admitted in the 24 hours before the census were of this birth weight. This proportion was similar to that found in the British Births Survey of admissions to special care baby units.

TABLE IV—Birth weight according to gestational age in babies in special care baby units

Gestation (weeks)	Birth weight (g)				Total
	<1500	1501-2000	2001-2500	>2500	
<37	81	96	92	43	312
≥37	3	13	74	145	235
Total	84	109	166	188	547*

\*Excludes seven in which birth weight was not recorded.

Discussion

The census approach to an examination of special care facilities for babies suffers from the major disadvantage that it does not take into account the daily variations in work load and staffing ratios allowed for coping with the work load. Nevertheless, it does highlight deficiencies and can be a valuable and easily administered aid for planning future provision.

Our survey indicates that the proportion of live born infants who need to be admitted for special care is nearer 13% than the 23% assumed by the expert group, so their minimum estimate of 5.1 cots per 1000 live births may be nearer the true requirement. The group may have underestimated the improvements in obstetric care that have made difficult deliveries less common. The reduction in the need for cots may also be partly due to the general trend of not separating mother and baby unless absolutely necessary. But whatever the cause, this lower estimate, together with the fall in the birth rate, seems to

indicate a need for further rationalising the provision and distribution of special care baby units.

The case for this is further strengthened by our other findings. Even in the three well-endowed regions in this study it has not proved possible to staff and equip all officially recognised units to the standard recommended by the expert group. Moreover, since the group's report was published, increasing technological requirements together with inflation have made it a continuing struggle to maintain the standard of excellence required of the few units that provide intensive care for the ill babies. A further argument for rationalisation is the demonstration by Blake *et al*<sup>9</sup> of the successful results of transporting sick babies when this is well organised by the intensive care nursery that is to receive the babies.

Any replanning of nurseries must, however, take into account such factors as the density of population of child-bearing age and, particularly, local variations in incidence of low birth weight, which may be related to poor social conditions and the presence of ethnic minorities. New planning tools such as maps which indicate travelling times from place to place must be used, and the need to place the units in hospitals with specialist paediatric, maternity, and pathological facilities must be recognised. Other problems that need to be tackled include that of maintaining a high quality of neonatal care in hospitals without special care units. Medical and nursing staff should be encouraged to move between hospitals much more than they do at present so that as many staff as possible have experience in caring for sick babies.

Any future planning or rationalisation of resources must be accompanied by systematic and continuous monitoring of the results of treatment in all units that accept babies for special care. Monitoring the outcome assumes greater significance in the light of the results of treatment that have recently been published.<sup>1-3</sup> What happens to babies of low birth weight is a highly specific indicator of the effectiveness of hospital care. Variables such as maternal age, parity, and social class are of minor relevance beside birth weight. The neonatal mortality of

low birth weight infants can already be monitored through the annual returns made by districts and areas on form LHS 27/1. The national neonatal mortality of infants weighing less than 2500 g based on these returns was 99 per 1000 in 1974, and this figure could be used as a baseline for local comparison. The presence of certain handicaps, notably cerebral palsy, would be a more specific indicator than neonatal mortality in this group of infants. Current information systems do not include such data but they would be easy to collect if properly organised by, for example, a specialist in community medicine (child health). But whatever the method, such monitoring should become a routine procedure.

We acknowledge the help given by many medical, nursing, and administrative staff in the three regions, without whom the study could not have been done. Professor J N Morris gave much constructive advice. The survey in the South-east Thames Regional Health Authority was carried out with the support of the DHSS.

## References

- Rawlings, G, *et al*, *Lancet*, 1971, **1**, 516.
- Prodholm, L S, Calame, A, and Steinhaver, J, in *Perinatal Medicine: Report of the 3rd European Congress of Perinatal Medicine*, ed H Bossart, *et al*, p 171. Bern, Huber, 1972.
- Davies, P A, and Tizard, J P M, *Developmental Medicine and Child Neurology*, 1975, **17**, 3.
- Working Party on the Prevention of Early Neonatal Mortality and Morbidity, *Report*, HC(76)40. London, DHSS, 1976.
- Expert Group on Special Care for Babies. *Report*, Reports on Public Health and Medical Subjects, No 127. London, HMSO, 1971.
- Department of Health and Social Security. Notes on Form SH3 for 1976, para 66.
- Central Health Services Council, *Report of the Sub-Committee on the Prevention of Prematurity and the Care of Premature Infants*. London, HMSO, 1961.
- Chamberlain, R, *et al*, *British Births 1970*, p 171. London, Heinemann, 1975.
- Blake, A M, *et al*, *British Medical Journal*, 1975, **4**, 13.

(Accepted 31 August 1977)

# Treatment of hepatic hydatid disease with mebendazole: preliminary results in four cases

A BEKHTI, <sup>et al.</sup> J-P SCHAAPS, M CAPRON, J-P DESSAINT, F SANTORO, A CAPRON

*British Medical Journal*, 1977, **2**, 1047-1051

## Summary

Mebendazole was given to four patients with hepatic hydatid disease. In three patients hydatidosis had remained after surgery, and in the fourth it could not be treated surgically. Mebendazole was given orally in

maximum doses of 400-600 mg three times a day during courses lasting 21 to 30 days. Ultrasonic echotomography showed a complete regression of the intrahepatic cysts after four to 13 months in all four cases. In three patients the course of treatment had to be repeated. Mebendazole also induced clinical improvement and a progressive lowering of the concentration of specific IgE of *Echinococcus granulosus*. During treatment circulating blood levels of specific immune complexes of antigen 5 were increased.

These observations indicate that mebendazole has a lethal effect on *E granulosus* cysts in primary hydatid disease in man and that the efficacy of chemotherapy can be assessed with ultrasonography and by measuring changes in the concentration of specific IgE of *E granulosus* and circulating immune complexes.

Department of Clinical and Pathological Medicine, Bavière Hospital, 4020 Liège, Belgium

A BEKHTI, MD, consultant in internal medicine and gastroenterology

Obstetric and Gynaecological Clinic, University of Liège, Liège

J-P SCHAAPS, MD, registrar

Centre for Immunology and Parasitology, Institut Pasteur, 59012 Lille, France

M CAPRON, PHD, lecturer

J-P DESSAINT, MD, lecturer

F SANTORO, attache de recherches au CNRS

A CAPRON, MD, professor

## Introduction

Hydatid disease is one of the rare parasitic conditions that can be treated only by surgery. Despite the improvements in surgical