Little guidance is available concerning the type of children’s ward accommodation most suitable for the tropics. Hospitals are still being built without any children’s wards and special facilities for neonates are seldom found outside teaching hospitals. Where such facilities exist, design has conformed to the traditional type of premature baby unit, which may be neither suitable nor desirable for developing countries. In 1969 a neonatal unit specially designed for the tropics, allowing for close observation, and full involvement of the infant’s mother, was added to the pediatric wards of the Wesley Guild Hospital, Ilesha. The purpose of this paper is to review the work of this unit during its first two years.

The neonatal unit is part of a 175-bedded general hospital situated in the rain forest zone of Western Nigeria, which together with a government general hospital serves a population of 475,000. In 1968 child in-patients aged 0-5 years numbered 3,353 out of a total of 6,524 hospital admissions. Approximately 10% of the children were less than one month old and the neonatal mortality rate was 20.8%. The overall mortality rate for the children’s ward has been 12.5% over a four-year period, 1968-1971 inclusive.

There had been a growing awareness of the need to provide more individual care and supervision for this large number of babies previously nursed in the general pediatric wards, and at the same time allow their mothers to stay in the ward, learning and participating in this care. The unit was designed to meet these two objectives and was built at a cost of £8,000 (approximately £330 per cot). It was opened in April 1969.

**Ward Design and Staffing.**

The unit has accommodation for 24 neonates and their mothers. As shown in Fig. 1, six cubicles are arranged facing a central nursing area. Each cubicle has two cots and is joined to an outer room where the mother sleeps, and rests during the day when she is not with her baby. Access to this room is by an outer corridor, as shown. The mother, although in constant contact with her child, does not pass through the nursing area, nor does she enter other cubicles. Such an arrangement facilitates participation by the mother but should reduce to a minimum the possibility of cross-infection. Walls and inter-communicating doors are made of glass for easy observation. Infants of low birth weight or those with non-infectious conditions are nursed in this section. There are three outer and larger rooms facing the main corridor, each with space for up to four cots. Babies with infections are nursed here and the mother sleeps on a bench in the same room. One of these is reserved for infants with tetanus. Toilet facilities for the mothers are provided at the end of the main corridor and in addition to this the hospital has a “mother’s shelter”. This is a simple building a short distance from the wards where mothers of all child in-patients can perform their various domestic tasks.

Equipment has been kept to a minimum for financial reasons and difficulty in maintenance. Ambu foot-suckers are used, and oxygen, when available, is supplied in small portable cylinders. One Oxygenaire incubator is kept for very small infants, but problems of servicing and the lack of a constant supply of electricity have at times interfered with its usefulness. Wooden cots (Fig. 2) made at the hospital at a cost of £5, are used for most infants. Each is constructed as a simple rectangular box in the base of which are fitted two electric light bulbs in series. The mattress, made of a thin sheet of foam rubber with a plastic covering, is supported on a wire mesh above, allowing the warmed air to circulate.

Nursing staff consists of five Nigerian certified midwives, a student nurse and a pupil midwife under the supervision of an S.R.N. S.C.M. staff

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*Thanks are due to nursing and medical colleagues at the Wesley Guild Hospital for their encouragement in the preparation of this paper, and to Dr. David Morley of the Institute of Child Health, London, for his helpful advice. The “Ilesha Incubator” as shown in Figure 2 was designed by Dr. J. Hartfield, M.R.C.O.O.*

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MARY THWAITES AND C. A. PEARSON

THE "ILESHA" INCUBATOR

Formica sulci

"Ilesha Incubator".

nurse who had also completed a premature baby course in the U.K. A pediatrician, who has responsibility for 65 in-patient beds and a daily under-fives’ clinic, has been in charge for only 14 months out of two years under review.

Infants are referred from the maternity department, or brought from home via the under-fives’ clinic, or to casualty. A few are referred from other hospitals. The 26-bedded maternity unit which has approximately 1,000 deliveries per year has its own "special care nursery". This caters for most sick newborns who cannot be nursed at the mother’s side. Only those with special problems are referred to the new unit, including many, but not all, with a birth weight of 4 lb 8 oz or less. Neonates are admitted from the clinic or casualty at the discretion of the doctor on duty, but wherever possible minor disorders are treated on an out-patient basis. Occasionally admission is refused by the mother.

Results

All the figures were obtained from a review of the records of infants admitted during a two-year period from May 1969 to April 1971 inclusive. They do not, however, represent the total neonatal admissions to the hospital during this period, as initially tetanus patients and some of those thought to be infectious were nursed in the adjoining cubiced ward with older children. From September 1970 all sick infants under the age of one month were accommodated in the new ward. Admissions, deaths and mortality rates are shown in Table I.

During the two-year period there were 1,835 live births in the maternity department, with 97 neonatal deaths. Sixty-four of these died in the maternity ward, 89% within 24 hours and many immediately after delivery; and 33 died after transfer to the neonatal unit.

Babies delivered at home and brought to the under-fives’ clinic, which functions six days a week, or as emergency admissions, come from Ilesha town (pop. 165,000) or from villages scattered over an area of about 200 square miles. Distances travelled by mothers whose babies were admitted to the new unit are shown in Table II.

<table>
<thead>
<tr>
<th>Distance from hospital</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ilesha town</td>
<td>274</td>
<td>48.9</td>
</tr>
<tr>
<td>2-10 miles</td>
<td>95</td>
<td>16.7</td>
</tr>
<tr>
<td>10-50 miles</td>
<td>120</td>
<td>21.1</td>
</tr>
<tr>
<td>More than 50 miles</td>
<td>9</td>
<td>1.5</td>
</tr>
<tr>
<td>Unknown</td>
<td>10</td>
<td>1.8</td>
</tr>
</tbody>
</table>

Thus over 30% came from more than 10 miles to the hospital. Travelling is mainly by lorry but some, coming from more isolated villages, walk much of the distance, the baby always carried on the mother’s back. Records of infants born at home were analysed to detect whether the distance travelled might have an effect on early mortality; figures are shown in Table III. Approximately 35% of all deaths occurred on the first day of admission.

Of the babies admitted from distances between 10 and 50 miles, 7.5% died within 24 hours, compared with 8.0% of 274 Ilesha infants. Overall the mortality rates for the different groups are similar.

Reasons for admission are indicated in Table IV. The figure of 4 lb. 8 oz, which represents the 3rd percentile for birth weight in this community has been adopted as the criterion for low birth or admission weight. The terms "prematurity" and "small for dates" have not been used, as no attempt was made to classify newborns according to gestational age during the study period.

The 26 babies with tetanus were all admitted during the last eight months of the study period. Those admitted previous to this were nursed elsewhere and therefore not included in this review. Conditions not due to infection accounted for 518 (74.5%) of the admissions. The majority of deaths also occurred in this group.

<table>
<thead>
<tr>
<th>Distance from hospital</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ilesha town</td>
<td>22</td>
<td>8.0</td>
</tr>
<tr>
<td>2-10 miles</td>
<td>10</td>
<td>11.5</td>
</tr>
<tr>
<td>10-15 miles</td>
<td>14</td>
<td>7.5</td>
</tr>
<tr>
<td>More than 50 miles</td>
<td>1</td>
<td>10.0</td>
</tr>
</tbody>
</table>
be achieved, by manual expression of the breasts and careful supervision of feeding techniques. After discharge from hospital the infant’s survival and the quality of his survival depend on the mother’s ability to cope; this in turn depends upon what she has learnt in the ward, achieved only by constant exposure to instruction and active participation in the care of the baby.

Nursing staff have welcomed the mother’s presence. She is the keenest observer of her own child and through her vigilance by his cot is often the first to detect changes in his condition, perhaps unnoticed by a busy nurse who has up to 24 babies in her care. This contribution made by the mother is an integral part of the total care. Barnett, reporting on a study at Stanford University, California, where mothers were allowed to handle their newborn premature infants as an experiment, comments on the need for mothers to be involved with their babies at this early stage. Much of the caution in the past has been due to fear of cross-infection. Barnett’s findings indicated that the presence of the mother did not increase the risk or the occurrence of infection.

The majority of infants (80%) were brought from outside the hospital. Distance travelled before admission had no apparent effect on early mortality, but the numbers were too small to be conclusive. Babies are always carried on the mother’s back, a position which ensures maximum warmth and reduces the danger of hypothermia—such a common complication in low birth-weight babies.

Most admissions, and deaths, were for non-infectious conditions. This is in contrast to the findings of Bwibo, who found in the Mulago Hospital, Kampala, that infection was responsible for 61% of neonatal deaths. No valid conclusion can be drawn from this difference in findings, since the figures in the present paper are not fully representative of the spectrum of neonatal hospital admissions, as not all neonates with infections were nursed in the new unit during the first few months.

Discussion

Many children’s wards in the tropics are overcrowded, poorly ventilated and understaffed. This often leads to cross-infection and poor supervision. To admit small neonates to such an environment is hazardous, and rarely is separate provision made for them except in the nurseries of maternity wards; the latter catering only for that small percentage of the population who elect to have their babies in hospital. In developing countries where childhood mortality is still alarmingly high, emphasis is rightly placed on those pre-eminently preventable conditions—measles, gastroenteritis and protein-calorie malnutrition—which remain the major causes of death. But the time is approaching when this high neonatal mortality must be tackled, and although this new unit may be regarded as something of a luxury at the present time, its advantages are worthy of note. The care of newborn infants in this hospital has been greatly facilitated, an opportunity for the study of neonatal disease has been opened up, and much has yet to be learnt about neonatal disease and methods of care of the newborn in the tropics. Many of these infants will require admission to hospital and separate accommodation is desirable. The ward must aim to combine efficiency and good nursing care with simplicity of construction, opportunities for teaching by all members of the staff, and maximum involvement and education of the mothers. Work in this neonatal unit suggests that the development of such objectives may be possible.

REFERENCES


Mary Thwaites and C. A. Pearson

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