

The Nurse's Task in the Care of Premature Children

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The treatment of children born before term is the touchstone of the worth of a nurse. Such treatment is the most difficult task which can be entrusted to her. It is a matter of life and death, and demands devoted attention.

The general principles applying to the care of babies hold equally well for premature infants, but in this case they must be carried out still more rigorously.

This memorandum gives a brief description of the principal methods for the care of these babies, as employed in the *Aarau Pediatric Clinic*. These methods are based on experience acquired over the course of many years.

Because of lack of space, we are obliged to lodge six to eight premature children per room. Only nurses looking after these children may enter this "sanctuary" of the babies' section, since continual coming and going, the presence of strangers, the stirring up and introduction of dust, etc., may add to the risk of infection and endanger the lives of these tiny patients.

In the first place, preventive measures must be taken against loss of heat and special attention is essential in this respect on the part of the midwife, in the maternity hospital as well as at the baby's home. Many children born before term are brought to us in a grave state of thermal insufficiency. Consequently, the child must be ensured adequate thermal protection from birth, on the principle that attention should not be directed towards the mother first and the child afterwards, but should be given at least simultaneously to both mother and newly-born baby. The child born before term should be immediately placed in a small cot heated by hot water bottles. Considerable heat losses frequently occur during the transport of the child from its home or the maternity hospital to the paediatric clinic. Such transport should

never be carried out merely on a pillow, but in a basket with a rubber hot water bottle at the bottom and two others, on each side of the child, so that the latter can be carried in a well warmed "nest".

A radiological examination of every premature child is carried out as soon as it is admitted to the clinic. In this way, it is possible to detect any of the following without delay: deglutition pneumonia, atelectasy, congenital cardiac deficiencies and hyperplasia of the thymus—appropriate treatment can then be immediately commenced. Blood and urine analysis also frequently lead to surprising discoveries. As soon as it enters the clinic, and without special prescription, each child is given an ampule of vitamin K during the first three days. If the mother is Rh negative, it is clearly necessary to carry out an immediate clinical examination of the child in view of the possible presence of severe jaundice. Children of eclamptic mothers also call for special attention. They generally develop only with difficulty. It is especially necessary to determine whether the respiratory passages are perfectly clear and to ensure that mucous or amniotic fluid is not obstructing the pharynx, larynx or nasal cavities. Careful aspiration by means of a narrow rubber tube may often save the child's life. It is also essential to determine whether congenital goitre is present, in which case the maintenance of the head in an inclined position by placing a small bolster beneath the nape of the neck often makes it possible immediately to eliminate respiratory difficulties and, consequently, the danger of cyanosis.

Oxygen is given to every child with respiratory difficulties or which appears unwell. In this respect, oxygen masks and tubes are of very great help to us. In the case of apnoea, we give subcutaneous injections of coramine and lobesyn as stimulants, the dose being 0.1 ml.

Every child born before term should be given extremely thorough individual attention, which may be classified under the following four headings :

- (1) Observation
- (2) Hygiene
- (3) Thermal protection
- (4) Nutrition and feeding technique

1. Observation.

Just as a forester can read the secrets of the forest, understand the animals and foretell changes in the weather from their behaviour, so should the nurse be able to recognize at a glance what is happening around her. She will attain this ideal only by devoting herself body and soul to her task.

Children born before term should be constantly watched over during the first days of their life. More than 50 per cent of them die after a few hours or a few days following severe cerebral haemorrhage or other brain lesions, congenital cardiac deficiencies or deglutition pneumonia. In some respects the child's weight is a decisive index, since the vital energy also plays a big part in this field. Sudden asphyxia or even respiratory stoppages are not rare. Similarly, the doctor should immediately be informed of all cases of spasm, cramp, irregularities in breathing and also when the child appears unwell.

2. Hygiene.

Meticulous cleanliness is essential to prevent infection. The nurse wears a double thickness mask, i.e., 16 layers of gauze over the mouth and nose so as to avoid the danger of infection by Flugge's droplets. Nurses suffering from severe colds in the head are removed from the babies' room without delay. It is compulsory to wear a white, sleeved apron in this room. Before and after all contact with the children, the staff are obliged to wash their hands with soap and hot water and then to disinfect them by means of a cloth soaked in 70 per cent alcohol. Each child receives its own small personal outfit, layette, linen, breast-pump and feeding bottle. The swaddling clothes and napkins used for premature children

are laundered separately so that they do not come in contact with linen from other parts of the clinic. Clothing, frocks and bonnets are washed by the nurses and students, who usually make them themselves. This last custom tends to create a particularly close link between the little ones and those looking after them. The care of premature children is entrusted to the most experienced nurses; furthermore, it is important to ensure the greatest possible continuity in the employment of the staff.

All the children are washed or bathed once a day. During this procedure they are given a minute physical examination and cutaneous irritation, edema, if present, as well as all slackness or tightness of the skin, abdominal swelling, etc., are reported. If the babies are in a state of cramp, only the face, umbilical area and buttocks are washed while waiting for the attack to pass away. It is very important always to work speedily and, at the same time, very conscientiously and without haste. The scales, bath, hot water bottles, fresh pre-warmed swaddling clothes and, possibly also enema syringes should be prepared in advance before the premature child is undressed. To maintain the temperature and avoid too rapid heat loss, the baby is warmed from above by thermal radiation and from below with a rubber hot water bottle. For the same reasons, premature children weighing less than 1,500 gms are weighed only every other day; they are given a daily wash, using oil one day and water the next. The bath temperature should be 37°C and even 38°C for thermally deficient children.

3. Thermal protection.

The temperature inside the room should be 18°C. We have no incubators but we try to avoid too big a variation in the temperature of the room.

Frequent ventilation is necessary. So as to avoid the harmful effects of draughts during ventilation, the cots must be covered with a thin sheet. Whenever the weather and season make it possible, the older premature babies are taken to the

terrace. Fresh air treatment is strongly to be recommended, since it reduces the pre-disposition to infection.

To maintain the bed and the surrounding environment at the desired temperature, the nurse should trust less to the thermometer than her own powers of observation.

So as to ensure as uniform a temperature as possible around the child, three well covered hot water bottles are used and renewed at regular intervals. Babies weighing less than 2,000 gms at birth are wrapped in cotton wool and dressed in a padded vest and bonnet. The amount of heat supplied from outside need not necessarily be the same for all children. Here too one must know how to adapt treatment to individual cases. A rectal temperature below 36.5°C may be due to the external temperature being too low, i.e., to lack of adequate care, but it may also be a sign of the insufficient development of the calorific centre leading to an unfavourable prognosis.

4. Nutrition and feeding technique.

In our experience, nutrition based on the mother's own milk ensures the best development in premature children as in other babies. We obtain the necessary human milk by taking it from the mothers, making use of wet nurses or by calling on our services for the collection and storage of human milk.

During the first days of life, the child's food intake is carefully controlled, so as to avoid possible trouble in the gastro-entric functions before the latter are sufficiently developed. However, so as to supply the baby with the necessary volume of liquid, a five per cent glucose solution is frequently added to small amounts of mother's milk. When a child born before term shows symptoms of very pronounced physiological jaundice, a sign that the liver is insufficiently developed, it is frequently given during the first days, skimmed human milk, possibly together with a five per cent glucose solution. The nutrition of premature babies who do not show any signs of illness during the first 7-14 days is raised from a minimum to an optimum amount,

i.e., they are given per 1 kg. of body weight, on the average 106 calories/kg. for 15 to 30 days, 117 calories/kg for 30 to 45 days, and 122 calories/kg for 45 to 60 days.

As from the eighth day following birth, the mother's milk is progressively enriched by means of Finkelstein's albumin milk, with a low fat content, (prepared using "Ursa" albumin milk powder made by the Bernese Alpine Milk Company), whereby we gradually bring the composition to two-thirds human milk and one-third albumin milk with low fat content. Thanks to this addition of albumin milk, we succeed in satisfying the increasing needs in albumins and minerals of the premature child in course of rapid development. When the margin of tolerance of the child born before term increases, the albumin milk with low fat content is gradually replaced by Finkelstein's albumin milk with high fat content (i.e., by "Ursa I"). If the premature child gradually gains in strength and if it is impossible to obtain the mother's milk, we gradually go over to a diet based entirely on albumin milk which can be subsequently kept up at the child's home for weeks and months as a regular diet. Indeed, albumin milk is a complete food, containing adequate amounts of albumin and fats.

This form of nutrition has made it possible in this clinic for us to increase the weight of premature children weighing less than 2,000 gms. at birth by an average of 27.5 gms per day and, in the case of premature children with a birth weight exceeding 2,000 gms, by 29.2 gms daily. Cases of disturbances in the digestive tract as well as other upsets, no matter what their cause, are included in these figures.

Prematurely born children need a great deal of rest and for this reason we normally give them six feeds daily, taking care that no feed occurs during the critical period, i.e., between 3 and 7 a.m. For babies suffering from sickness, however, (vomiting during first days of life, habitual vomiting or pyloric hypertrophy) the food given is divided up into eight to twelve feeds daily.

From the point of view of infant welfare, the technique of feeding plays an essential part. When the child has the reflexes of sucking and swallowing, it is fed with a feeding bottle. When it has not the swallowing reflex, we make use of a small spoon or a pipette. When both reflexes are absent, premature babies are tube-fed. We do not hesitate to feed the babies by means of a tube introduced into the mouth, even in the case of those who are merely weak or tire rapidly or, again, with those showing signs of cyanosis in the triangle between the nose and mouth. At feeding time, the baby is taken from its cot and placed in a comfortable position on the knees, so that the nurse has her two hands free. The lower jaw is gently drawn down with a napkin so as to open the mouth and the nipple of the feeding bottle introduced. While keeping the child vertical, it is induced to suck two or three times in succession. Time and patience are necessary; these are two factors which play an important part in infant nutrition and without which all technique would be useless.

After feeding, the babies are placed in a comfortable position on their side, the left side for preference when dealing with babies who throw up. By means of blocks of wood, all the cots are raised at the head end. This reduces respiratory difficulties which might arise from a full stomach, and apnoea, as well as deglutition pneumonia, thus becomes less frequent.

During the fourth week, each child born before term receives 200,000 units of strongly concentrated vitamin D. It is given two further doses of 200,000 units at intervals of one week so that it receives a total massive dose of 600,000 units—1 ml in the course of three weeks. In order to prevent anaemia among these premature babies, we give them fresh blood transfusions as soon as the first symptoms appear. It need hardly be said that in such cases blood belonging to the same Rh group as that of the baby is employed.

So that the state of the child can be regularly evaluated, it is very useful both for the doctor and the nurse to draw up an exact temperature chart. This chart shows, in the form of graphs, the following details for every premature baby during the whole of its stay in the clinic: temperature, pulse and possibly heart reactions, breathing rate, oedema, jaundice, amount of food given, amount and composition of the stools. This graphical record represents, so to speak, a daily picture of the state of the child born before term. We feel that it is particularly important to note respiratory irregularities on this chart, which alone make it possible during later weeks of life to track down the commencement of interstitial plasma cell pneumonia.

Thanks to all these measures for the care and nutrition of the infants born before term entrusted to us, we have succeeded in keeping mortality down to a very low level. Of course, even with us mortality among premature babies is considerable since we receive all children born before term from an area with 400,000 inhabitants and these babies are brought to us in the first hours after birth. The mortality rate is 50 per cent during the first seven days. Subsequently, i.e., after the first seven days, the mortality rate does not exceed 10.8 per cent and it should be remarked that cases of death which are more or less directly related to the care given to the child (interstitial plasma cell pneumonia, dyspepsia, poisoning, pneumonia) amount to only 6.4 per cent.

We are perfectly aware that the life and death of these small beings does not depend solely on our efforts, but as nurses, we welcome the opportunity given us to make many parents happy by keeping a large proportion of these prematurely born babies alive through our devotion and the faithful carrying out of our duties.

(This paper was read at the International Congress on Pediatrics in Zurich, 1950).