



# Conventional study and discussion on premature infants nursing essentials and feeding methods

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## Abstract

Explore the nursing essentials and feeding methods for premature infants and their clinical effects. We selected 90 premature infants born in the neonatology department of our hospital over the past year, implemented the nursing measures combined with several nursing methods and reasonable and effective feeding methods according to the clinical manifestations of the premature infants, and observed the clinical effects. After a period of careful nursing, among these 90 premature infants, 2 infants died unfortunately, 4 infants abandoned the treatment, the remaining premature infants were discharged in good condition in all respects, could autonomously suck milk and reach the minimum daily suction volume, their weights increased to some extent, and their body temperatures could maintain normal under normal room temperature condition. According to the clinical experience, timely implementing the nursing measures combined with several nursing methods and reasonable and effective feeding methods to the premature infants can effectively reduce the morbidity and mortality of premature infants, and improve the survival rate and living quality of the premature infants, so that it is suitable for clinical promotion.

**Keywords:** premature infant; nursing essentials; feeding method; exploration.

**Practical:** Timely implementing the nursing measures combined with several nursing methods and reasonable and effective feeding methods to the premature infants can effectively reduce the morbidity and mortality of premature infants, and improve the survival rate and living quality of the premature infants, so that they will become the key jobs of the nurses after the birth of premature infant, and are suitable for clinical promotion.

## 1 Introduction

Premature infant refers to the liveborn infant with a gestational age less than 37 weeks, a weight less than 2500 g, a head circumference less than 33 cm, and a height less than 45cm, and is also called immature infant (Cheng, 2010). Due to the premature infant is of insufficient gestational age and immature organ morphology and physiological functions, the abilities of premature infant to adapt to environment and resist disease and various living abilities are relatively low, and the mortality is higher (Sun & Yang, 2010). The relevant data show that the birth rate of premature infant in all newborns is 5%-10% in our country, and premature infants have extremely high mortality (12.7%-20.8%) which is higher with smaller gestational age and lower weight (Wu et al., 2006). Therefore, in order to increase the survival rate and living quality of premature infants, the most important thing is to timely implement the nursing measures combined with several nursing methods and reasonable and effective feeding methods. Now, the study and discussion on the nursing essentials and feeding methods of 90 premature infants born in the neonatology department of our hospital over the past year are reported as follows.

## 2 Materials and methods

### 2.1 Clinical data

We selected 90 premature infants admitted in the neonatology department of our hospital over the past year as the study objects,

including 50 infant boys and 40 infant girls; 60 infants were born through natural labor, 10 infants were twins, the gestational ages were 29-35 weeks, and the weights were 1000-2450 g. Among these premature infants, 30 infants suffered asphyxia and apnea, 20 infants suffered pneumonia, 15 infants suffered feeding intolerance, 8 infants suffered low living ability, and 17 infants suffered other diseases; the hospital stays were 5 to 45 days, 2 infants died unfortunately, the families of 4 infants abandoned treatment, and 84 infants survived.

### 2.2 Nursing and feeding

#### Nursing

##### Keeping warm

As the heat-regulating center of premature infant is not well developed, his/her thermoregulation will be difficult and unstable, and is easy to be affected by the surrounding environment; failure to keep warm is easy to cause hypothermia, resulting in the occurrence of apnea, scleredema, acidosis or other complications (Yan et al., 1996), so that keeping warm becomes one of the important measures for maintaining the normal temperature of premature infant and preventing the occurrence of neonatal scleredema, apnea or other complication (Cao, 2005). Generally,

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a special room for premature infants shall be set, where the temperature shall be controlled at 24 °C-26 °C (increased to 27 °C-28 °C in the morning) and the relative humidity at 55%-65%. After birth, the nurse shall rapidly wipe up the amniotic fluid and bloodstain on the body of premature infant, then transfer the infant to the Premature Babies as soon as possible, and place into the preheated incubator. The temperature of incubator is generally preset at 32 °C-35 °C and the humidity at 50%-60%, which will be adjusted according to the weight and gestational age of the premature infant (Ma, 2013). Low weight and small gestational age will lead to higher temperature and humidity of incubator. In general, the temperature of incubator for infant less than 1000 g will be set at 34 °C-36 °C, 32 °C-34 °C for 1001-1500 g, 30 °C-32 °C for 1501-2000 g, and 28 °C-30 °C for infants above 2000 g. The nurse shall measure the body temperature of premature infant on schedule, and adjust the temperature of incubator according to the body temperature, thus maintain the infant's body temperature at 36.5°C-37°C; the temperature difference between daytime and nighttime shall not exceed 1°C. Please note that, all treatments and nursing operations shall be done in the incubator, and frequent movement shall be avoided, which may influence the growth and health of the premature infant. The nurse shall also closely observe the conditions in the incubator to identify and handle the problems as soon as possible and to reduce the mortality. When the milk intake and vital signs of the premature infant become normal, and the infant can maintain normal temperature when the incubator temperature is very low or is not heated, the nurse can move the infant out of the incubator, and measure the body temperature on time to avoid repetition.

#### Nursing for infection prevention

Due to deficiency of immunologic function, the resistance of premature infant to various infections is very weak, even mild infection will cause sepsis or other serious consequences (Jin et al., 1997). Therefore, a strict disinfection and isolation system shall be established, and any person other than the family members and medical workers shall be prohibited to visit the ward. Before feeding milk or doing any other thing, the family member and medical workers must put on sterilized clothes and shoes, wear mask and hat, repeatedly wash the hands and disinfect thoroughly. Before feeding milk, carefully disinfect the milk, the feeder and nipple can only be used for one infant to avoid cross infection. Use 75% ethyl alcohol to scrub the umbilical region of the infant, twice a day, and timely change the diaper; if the infant can bath, bath once daily, if not, use soft cloth to gently scrub the body, so as to keep the umbilical cord and skin dry and clean and avoid the generation of germs (Ma, 2008). The incubator shall be thoroughly disinfected and cleaned before use, wiped with disinfectant fluid once a day during use, and replaced once a week. The humidifier in the incubator and the water in oxygen humidifying bottle must be replaced daily, the sponge in the air filter net shall be cleaned periodically, and the cap, oxygen tube and all instruments and pipes accessible to the premature infant shall be disinfected periodically. The mother who catches a cold must wear a mask when breast-feeding, before which she must wash her hands with soap and hot water; the medical worker who catches a cold cannot enter the ward, so as

to avoid cross infection. The ward shall be ventilated every day to keep the air fresh, and shall maintain stationary temperature and humidity; spray water when cleaning the ward to avoid dust causing lung discomfort; disinfection by ultraviolet light shall be done periodically to the ward.

#### Illness monitoring and nursing for respiratory tract

After the birth of premature infant, the nurse shall immediately clean up his/her respiratory tract to avoid blocked breath. The premature infants are featured by complex illness state and quick change, so that monitoring instruments shall be used for closely monitoring the vital signs of premature infants, and the nurses shall also closely observe the general conditions of the infants, such as food intake, mental condition, face color, reflection, crying voice, skin color, defecation volumes, and make proper records (Liu, 2010). Pay constant attention to the lying position of the infant, and adjust continuously to avoid neck bending; wherever possible, keep the infant at the position of "nose inhalation" as far as possible, and make the posterior pharyngeal wall, throat and trachea on a straight line, so as to guarantee the air can enter freely. In addition, pay close attention to observe whether the infant's respiratory tract contains phlegm and whether emesis occurs; if phlegm exists, suck out immediately, if emesis occurs, clean immediately, so as to avoid the infant inhaling such things into the respiratory tract. As the respiratory center of premature infant is not maturely developed, apnea, cyanosis or irregular respiration will occur frequently; once occurred, the nurse shall immediately implement such treatment methods as flicking the planta pedis, back supporting or oxygen inhalation to the infant. It should be noted that when the infant is receiving oxygen inhalation treatment, keep the respiratory tract unobstructed, the oxygen concentration shall be kept at about 25%, the inhalation rate shall maintain at 0.5 L/min, and the continuous oxygen inhalation duration shall not exceed 3 days; once the breathing becomes normal or the symptom improves, immediately stop oxygen inhalation to avoid fibrovascular proliferation occurring to the retina not vascularized due to too long oxygen inhalation time and too high concentration, which are also easy to cause retinal detachment, resulting in weak vision and blindness (Shi, 2009).

#### Nursing for ward environment

Due to small gestational age and immature organ development, the premature infants have low environmental adaptability and strong sensitivity, so that the nurse shall create a quiet and comfortable ward environment similar to mother's uterus for the premature infant, and reduce the irritation of noise and light (Wang, 2012); talk and walk gently, do not talk near the bed or incubator where the premature infant lives, gently open the incubator door, and do not knock the incubator. The monitor and telephone shall be adjusted to the lowest voice, respond timely when the monitor gives an alarm. Avoid direct sunlight, and pay special attention to the eyes. In the daytime and good weather, the premature infants can receive natural irradiation of sun; for night sleep, reduce the indoor light, use light shield on the incubator to reduce the irritation of light to premature infants, thus guaranteeing the premature infants obtain good growing environment.

### Health education and discharge instructions for parents

The nurse shall offer psychological comfort to the parents of premature infants, help them build confidence, patiently explain the knowledge related to premature infant nursing and feeding to the parents of premature infant, and sort these knowledge points into a handbook and issue to the parents. Upon discharge, the nurse shall establish the health contact card which contains name, gender, contact way and recovery condition of the infant, and inform the parents of premature infants that post-discharge nursing is equally important, be sure to care and feed the infant according to the nursing handbook, visit the hospital to receive prophylactic vaccination on schedule, and timely contact the hospital if any problem occurs. The hospital also needs to make telephone return visit and scheduled return visit periodically, so as to timely learn the conditions of the infant and accomplish the long-term prognosis of premature infant.

### Feeding

#### Time for first milk and feeding

At present, more and more researches have showed that early nutritional support after birth plays an important role in the near-term weight gain of infant, can effectively reduce the morbidity and mortality, and greatly contributes to the long-term prognosis (Wang, 2003). The nurses shall prepare for the first milk time according to the physical conditions of the premature infant after birth. Start milk feeding as early as possible for the infants who are of large gestational age and good physical conditions and can suck autonomously. In general, try feeding sweet water twice within 2-4 hours after the birth of the infant, and if no emesis, bucking or other abnormal condition occurs, start breast feeding or feeding milk powder. As the gastric capacity of premature infant is small and the stomach is at horizontal position, the cardiac sphincter relaxes and the pyloric sphincter contracts, so that breast feeding shall follow the principles of step-by-step and small volume and high frequency, so as to avoid glutting causing milk spilling or even asphyxia. If the infant is of small gestational age and poor physical conditions, postpone the feeding time and adopt intravenous infusion to supplement nutrients for the infants.

#### Milk selection and feeding method

Breast milk contains arachidonic acid, docosahexaenoic acid, taurine and other nutrient substances necessary for the growth and development of the premature infant, and these essential nutrient substances play an irreplaceable role in the development of immune system, tissues and organs of the premature infant (Yang, 2016). Therefore, the nurse shall take breast milk as the first choice for feeding the premature infants. If the breast-feeding conditions are not mature, choose high quality infant formula for feeding. For the infants with good physical conditions and high sucking ability, allow the mother to feed in person to increase the closeness between mother and infant; for the infants with poor physical conditions, poor sucking ability or who cannot suck or suffer cyanosis, use

dropper or spoon for feeding; for infants with poor physical conditions and without sucking ability and swallowing ability, feed by nasal feeding method. Before nasal feeding, firstly suck the residual milk in stomach, stop feeding once if the volume exceeds 2ml, and do not feed if emesis and abdominal distension occurs (Wang & Shu, 2008); if necessary, the infant shall also be given total or partial venous hyperalimentation. The milk injection volume starts from 1-2 mL, the injection frequency shall be once every 1-2h, and the injection volume shall increase by 1-2 mL gradually; pay close attention to whether emesis or abdominal distension occurs to the infant before and after feeding. Pay attention to change the nasal feeding tube and injector once every day. For the infants who cannot tolerate intermittent stomach tube feeding or who suffers dyspnea or anoxia, adopt continuous stomach tube method, i.e. inject the milk at a constant speed of 1-2 ml/kg·h; however, when this method is used, pay attention to guarantee the correct position of stomach tube, strengthen inspection, replace the milk once every 4 hours, and inspect the remaining milk in the stomach. For the infants who suffer cyanosis and asphyxia, properly extend the feeding time and give intravenous injection of glucose, so as to avoid the occurrence of hypoglycemia and hyperbilirubinemia (Dong et al., 2003). Pay attention not to feed milk too fast, take up the infant after feeding and pat his/her back to expel the inhaled air, or keep the infant at lateral position and lift the head, so as to avoid milk spilling which may cause asphyxia.

#### Abdomen touching and massage

Clinical researches have showed that after feeding milk to the premature infant, abdomen touching and massage can effectively enhance the gastrointestinal motility of the infant, stimulate the digestive function, and expedite the absorption and excretion processes, thus improving the feeding intolerance condition of the premature infant as soon as possible (Guo & Yuan, 2003; Li, 2010). The nurse shall, about 30 minutes after feeding milk, thoroughly disinfect the hands and apply baby oil, rub to heat the hands, place the naked infant at supine position, touch and massage the infant abdomen (5-10 minutes per time, and 2-3 times a day). The specific operating steps are: centered on the umbilical region, move clockwise to draw a circle with two hands by turns, implement "I-, L-, U-" shaped touching methods, i.e. firstly use the finger pulp of right hand to massage from right upper quadrant to right lower quadrant, then from right upper quadrant to left lower quadrant, and from right lower quadrant to right upper quadrant, left upper quadrant and finally left lower quadrant. In addition, when carrying out touching and massage, the nurses shall pay attention to the massage speed (moderate) and strength (moderate, gentle and progressive), maintain the room temperature at 26 °C-28 °C, and keep the head and shoulder of the infant at an angle of 30°-40° when massaging to avoid regurgitation of gastric contents. After touching, the nurse shall record the daily defecation quantity and frequency and the residual milk quantity in the stomach (for the infant who requires stomach tube) of the infant, and observe whether abdominal distension occurs at any time (Wang et al., 2003).

### 3 Results and discussion

After a period of careful nursing, among these 90 premature infants, 2 infants died unfortunately, 4 infants abandoned the treatment, and 84 infants were cured and discharged; the survival rate reached 93.3%. In addition, the discharged premature infants were in good condition in all respects, could autonomously suck milk and reach the minimum daily suction volume, their weights increased to some extent, and their body temperatures could maintain normal under normal room temperature condition; all complications and infection symptoms were treated timely, and no serious complication was found.

### 4 Conclusions

Due to the premature infant is of insufficient gestational age and immature organ morphology and physiological functions, the abilities of premature infant to adapt to environment and resist disease and various living abilities are relatively low, and the mortality is higher. This article summarizes the nursing essentials and feeding experience of 90 premature infant cases, including keeping warm, infection prevention, illness monitoring, respiratory tract nursing, environmental nursing, health education and discharge instructions for the parents, as well as implementing different feeding methods and abdomen touch and massage, and concludes that: timely implementing the nursing measures combined with several nursing methods and reasonable and effective feeding methods to the premature infants can effectively reduce the morbidity and mortality of premature infants, and improve the survival rate and living quality of the premature infants, so that they will become the key jobs of the nurses after the birth of premature infant, and are suitable for clinical promotion.

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