

# Study on the Effect of Early Oral Motor Intervention in Preterm Infants in Neonatal Intensive Care Unit

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**Abstract:** *Objective:* To study the effective value of introducing the concept of early oral exercise in the process of nursing intervention for preterm infants in the neonatal intensive care unit (NICU). *Methods:* 96 cases of preterm infants diagnosed from January 2022 to August 2022 were selected and randomly divided into two groups: the general practice group (general nursing intervention), and the early practice group (early oral exercise intervention), and the effect of intervention on preterm infants in the two groups was observed. *Results:* After nursing care, the mean value of the non-nutritive sucking ability assessment ( $76.54 \pm 5.82$ ), the mean value of the intellectual development degree assessment ( $104.57 \pm 8.45$ ), the mean value of the psychomotor development degree assessment ( $102.33 \pm 6.74$ ), and the mean value of behavioral neural reflexes ability assessment ( $38.71 \pm 2.40$ ) in the early practice group were better than that as compared to the general practice group ( $P < 0.05$ ); the mean value of oral feeding start time of preterm infants in the early practice group ( $35.42 \pm 7.63$ ) weeks, the mean value of all oral feeding time ( $34.12 \pm 5.28$ ) weeks, and the mean time of hospital intervention ( $15.33 \pm 4.25$ ) days were lesser than compared to those of the general practice group at  $37.4 \pm 5.82$  weeks,  $37.46 \pm 3.55$  weeks, and  $20.46 \pm 2.91$  days, respectively ( $P < 0.05$ ); the rate of adverse reactions in preterm infants in the early practice group significantly lower than that of the general practice group ( $P < 0.05$ ). *Conclusion:* The introduction of the concept of early oral exercise intervention among NICU nurses improved the feeding effect, sucking ability of preterm infants, and intellectual development. Hence, early oral motor care should be popularized.

**Keywords:** Early oral motor intervention; Neonatal; Intensive care unit; Preterm infants; Application value

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## 1. Introduction

Premature delivery mainly refers to when a woman gives birth to a fetus during the 28–37th week of pregnancy and is a common complication. Infants are considered immature when their gestational age is less than 37 weeks. This is because the organs of premature infants are not yet fully developed, hence it is often necessary to admit them into the intensive care unit (ICU) for observation. The basic nursing intervention involves monitoring body temperature and providing parenteral nutrition support. However, if the oral feeding efficiency

of premature infants is inefficient and requires prolonged intravenous nutrition intervention, this will lead to a decrease in oral motor ability, which is not conducive to ensuring the comprehensive effect of the nursing intervention <sup>[1,2]</sup>. With the increase in innovative advanced medical concepts, early oral exercise intervention for premature infants is an effective model that can directly help premature infants alleviate problems of oral chewing and swallowing, and improve their quality of life. In this study, 96 cases of premature infants admitted to the neonatal intensive care unit (NICU) in our hospital from January 2022 to August 2022 were selected, and the effect of oral exercise intervention on premature infants was analyzed. The research is as follows.

## **2. Information and methods**

### **2.1. General information**

96 premature infants admitted to the NICU of our hospital from January 2022 to August 2022 were selected and randomly divided into two groups of 48 cases each. The general practice group consisted of 23 males and 25 females who had a gestational age of 32–35 weeks with an average of  $(33.91 \pm 2.40)$  weeks. The body mass ranged from 1500–2300 g with an average of  $(1950.34 \pm 263.71)$  g. 20 cases were born via vaginal delivery and 28 cases were born via cesarean delivery. The early practice group consisted of 24 males and 24 females with a gestational age of 33–36 weeks with an average of  $(34.82 \pm 1.94)$  weeks. The body mass ranged from 1600–2400 g, with an average of  $(2000.34 \pm 157.28)$  g. 22 cases were born via vaginal delivery and 26 cases were born via cesarean delivery. Inclusion criteria: (1) Premature infants with gestational age of less than 37 weeks and weighed less than 2500 g; (2) premature infants with complete clinical data. Exclusion criteria: (1) Premature infants who died due to other factors; (2) birthed due to maternal infection; (3) premature infants whose mothers were accompanied by pregnancy complications. This study was conducted after obtaining the approval of the Medical Ethics Committee of our hospital.

### **2.2. Methods**

The general nursing mode was introduced to premature infants in the general practice group, where the infants were mainly fed through tube feeding. Based on the condition of the newborns, the initial feeding amount was set to 3 ml/kg with an interval of 3 hours, and the feeding dose was gradually increased. Changes in the premature infant's swallowing ability were monitored. If the swallowing ability was ideal, the infant was introduced to bottle feeding. The premature infants were discharged once their physical indexes were normalized. Early oral exercise was introduced to premature infants in the early practice group. First, extra-oral care was provided. Premature infants were hand-fed every day. The faces of premature infants, including the cheek area and lips were lightly massaged for four minutes. Specifically, nurses used their thumb and forefinger to maintain a C motion to stimulate the muscle reaction of premature infants <sup>[3]</sup>. In the nursing of upper and lower lips, nurses should intervene based on the circumferential direction to stimulate the gum and tongue of premature infants and increase flexibility. To stimulate sucking, the nurses put their index finger on the hard palate of the premature infants accompanied by slow sliding motions, while muscle reaction speed was slowly increased. This procedure was carried out twice a day for 15 seconds. If the sucking action persisted, a pacifier was provided for two minutes for a soothing effect <sup>[4]</sup>. All premature infants were given nursing intervention for 60 days.

### **2.3. Observation indicators**

The non-nutritive sucking (NNS) ability of the premature infants after the nursing effect was assessed by the NNS scale, the intellectual development degree was assessed by the major depression inventory (MDI) scale,

the psychomotor development degree was assessed by the psychomotor development index (PDI) scale and the behavioral nerve reflex ability was assessed by the neonatal behavioral assessment (NBNA) scale [5]. The feeding process was recorded, including the initial oral feeding time, the total oral feeding time, and the average time of hospitalization. The adverse reactions of the two groups of premature infants were analyzed, including gastric retention, abdominal distension, nausea, and vomiting, and the incidence rate was compared [6].

## 2.4. Statistical analysis

In this study, SPSS 20.0 was used to analyze all the data, and Excel was used to establish a database; the mean  $\pm$  standard deviation was used to represent the measurement data and compared using the *t*-test. Count data were expressed as *n* (%) and analyzed using the chi-square ( $\chi^2$ ) test. The risks were analyzed by binary logistic regression and the results were considered statistically significant at  $P < 0.05$ .

## 3. Results

### 3.1. Statistics on the effect of nursing care for preterm infants

As shown in Table 1, the general practice group's non-nutritive sucking ability, intellectual development, psychomotor development, and behavioral neural reflexes were compared with the early practice group before nursing interventions, and there was a significant difference between the two groups ( $P > 0.05$ ). After nursing, the early practice group's non-nutritive sucking ability, intellectual development, psychomotor development, and behavioral neural reflexes were better as compared to the general practice group ( $P < 0.05$ ).

**Table 1.** Comparison of the outcome of care for preterm infants in two groups (mean  $\pm$  standard deviation)

Group	Non-nutritive sucking ability	Degree of intellectual development	Degree of psychomotor development	Behavioral neurological reflexes
Pre-Nursing				
Early Practice Group	32.58 $\pm$ 4.12	90.63 $\pm$ 5.72	91.44 $\pm$ 3.76	34.95 $\pm$ 6.28
General Practice Group	32.60 $\pm$ 3.22	90.58 $\pm$ 4.36	91.24 $\pm$ 3.56	34.86 $\pm$ 5.22
<i>t</i>	0.063	0.078	0.049	0.038
<i>P</i>	> 0.05	> 0.05	> 0.05	> 0.05
After Care				
Early Practice Group	76.54 $\pm$ 5.82	104.57 $\pm$ 8.45	102.33 $\pm$ 6.74	38.71 $\pm$ 2.40
General Practice Group	62.19 $\pm$ 6.33	89.63 $\pm$ 7.62	95.56 $\pm$ 6.34	36.99 $\pm$ 3.52
<i>t</i>	5.239	6.328	7.425	8.556
<i>P</i>	< 0.05	< 0.05	< 0.05	< 0.05

### 3.2. Statistics on the feeding process of preterm infants

The mean time of starting oral feeding of preterm infants in the early practice group (35.42  $\pm$  7.63) weeks, the mean time of oral feeding (34.12  $\pm$  5.28) weeks, and the mean time of hospital intervention (15.33  $\pm$  4.25) days were lesser as compared to those of the general practice group at 37.54  $\pm$  5.82 weeks, 37.46  $\pm$  3.55 weeks, and 20.46  $\pm$  2.91 days respectively ( $P < 0.05$ ).

### 3.3. Statistics on the rate of adverse reactions in preterm infants

The rate of occurrence of adverse reactions in preterm infants in the early practice group was 8.3% (1 case of

gastric retention, 2 cases of abdominal distension, 1 case of nausea and vomiting), which was lower than that of the general practice group, which was 16.6% (2 cases of gastric retention, 4 cases of abdominal distension, and 2 cases of nausea and vomiting) ( $P < 0.05$ ,  $\chi^2 = 6.352$ ).

#### 4. Discussion

The organs and bodily systems of premature infants are not yet fully developed, hence they often develop clinical symptoms such as unstable breathing, liver and kidney dysfunction, etc. Some premature infants also have problems regulating body temperature. If not treated promptly, the normal survival of premature infants is threatened. Hence, it is important to use oral feeding as an evaluation index. General nursing intervention only focuses on tube feeding and does not cover the importance of cultivating oral motor ability. As the premature infant's oral motor ability is restricted to some extent, this makes it difficult to guarantee an ideal feeding effect. The growth of premature infants is also hindered if tube feeding is used long-term. When general nursing intervention is combined with early oral exercise nursing, the sensory center of premature infants can be stimulated to promote swallowing, sucking, and oral functions so that their oral movement ability can be strengthened<sup>[7]</sup>. In this study, the nursing intervention effect of the two groups was evaluated. The results showed that after nursing, the average value of non-nutritive sucking ability, mental development, psychomotor development, and behavioral nerve reflex in the early practice group were  $76.54 \pm 5.82$ ,  $104.57 \pm 8.45$ ,  $102.33 \pm 6.74$  and  $102.33$  respectively. In the process of implementing early oral exercises, nurses can realize the importance of early oral exercise intervention and devote themselves to the healthy growth and development of premature infants. Based on the process of sequential nursing, early oral exercise intervention can increase the muscle reaction ability of premature infants and promote their sucking ability. The duration of providing nutrition by peripheral nutrition methods was shortened, and the transition from tube feeding to oral feeding was done earlier. This improves the intelligence level and behavioral nerve reflex ability of premature infants and also strengthens their sucking ability. The results showed that the average time of initial oral feeding, total oral feeding time, and hospital intervention in the early practice group were  $35.42 \pm 7.63$  weeks,  $34.12 \pm 5.28$  weeks, and  $(15.33 \pm 4.25)$  days respectively, which were shorter as compared to those in the general practice group. By analyzing the feeding process of premature infants, it was determined that premature infants who received early oral exercise intervention achieved the goal of receiving oral feeding earlier, mainly because oral exercise intervention improved their nervous system response-ability, accelerated the development of muscle tissue and nerve tissue, and promoted the swallowing reflex process of premature infants, thus reducing their hospitalization time<sup>[8]</sup>. In addition, the results showed that the incidence of adverse reactions of premature infants in the early practice group was 8.3% (1 case of gastric retention, 2 cases of abdominal distension, and 1 case of nausea and vomiting), which was lower than that in the general practice group (16.6%) (2 cases of gastric retention, 4 cases of abdominal distension and 2 cases of nausea and vomiting) ( $P < 0.05$ ). Early oral exercise intervention significantly increased the efficiency of nursing intervention, improved the physical fitness of premature infants, reduced abdominal distension or vomiting during feeding, and prevented re-admission.

#### 5. Conclusion

The model of early oral exercise intervention combined with general nursing intervention in the care of premature infants in the NICU has obvious advantages and needs to be popularized.

## Disclosure statement

The authors declare no conflict of interest.

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