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Clinical Effect of Oral Motor Training Combined with Pediatric Tui-na on Feeding Intolerance in Preterm Infants

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Abstract: ***Objective:*** *To investigate the intervention effect of oral motor training combined with pediatric tui-na on feeding intolerance in preterm infants to provide new treatment options and improve the quality of care.* ***Methods:*** *By using a non-simultaneous controlled clinical trial method, 75 eligible preterm infants from the neonatal unit of a tertiary care hospital in Jinan were selected as the experimental group to implement oral training combined with pediatric massage therapy. Another 60 preterm infants admitted in 2020 were selected as the control group, who had already received oral motor training but had not received pediatric massage. The experimental group was treated for 7 d and the efficacy of the two groups was compared. Comparisons between the two groups included signs of feeding intolerance such as vomiting, gastric remnants and other outcome indicators such as first oral feeding time, gastric tube retention time, increased milk volume at day 3 and increased milk volume at day 7, feeding initiation time, increased weight at day 3 and increased weight at day 7, recovery time of birth weight, and days of hospitalization in both groups.* ***Results:*** *The differences in gender, age, birth weight, and Apgar score between the two groups before treatment were not statistically significant (P>0.05) indicating comparability. After treatment, preterm infants in the experimental group showed significant improvement in feeding performance, first oral feeding time, gastric tube retention time, increased milk volume at day 3 and increased milk volume at day 7, increased weight at day 3 and increased weight at day 7, hospitalization days and other observed indexes compared with the control group, and the differences were statistically significant (P<0.05). There was no significant difference in the feeding initiation time and recovery time of birth weight between the two groups (P>0.05).* ***Conclusion:*** *The combined application of oral motor training and pediatric tui-na is significantly more effective than single oral motor training in the short-term treatment of feeding intolerance in preterm infants. This combination therapy helps preterm infants to increase milk intake and accelerate weight gain, helps the children to recover intestinal function, establishes early nutritional support, promotes growth and development, and reduces the risk of long-term complications. This treatment is simple safe and efficient, and has the value of popularization.*

Keywords: Preterm infant, Pediatric tui-na, Feeding intolerance, Oral motor training.

1. Introduction

Preterm infants refer to neonates with a gestational age of less than 37 weeks, accounting for about one-tenth of the annual newborn population in China. Compared with full-term neonates, preterm infants have underdeveloped physiological functions, lack gastrointestinal motility, and have poor swallowing, gastric emptying, and digestion and absorption functions [1-2]. Feeding intolerance is a common digestive system syndrome in preterm infants, with an incidence of about 30%. Its main manifestations include gastric residuals, vomiting, and abdominal distension after feeding, which can affect the growth and development of preterm infants once they occur [3]. In recent years, research on feeding intolerance has increased. Regarding drug therapy, some studies [4] have indicated that domperidone can be used as a prokinetic agent for feeding intolerance, but drug therapy has a long cycle and limitations in clinical application. For non-pharmacological treatments, oral motor training and kangaroo mother care have been widely tried and applied.

Oral motor training includes non-nutritive sucking (NNS) and oral stimulation (OS). For example, Xu Dongmei et al. [5] explored the efficacy of breast milk olfactory stimulation combined with oral motor training, and CAKA et al. [6] showed that the combined use of kangaroo mother care and NNS can shorten the transition time to full enteral feeding. Studies have shown that NNS can accelerate the maturation of the suck-swallow-breathe coordination function in preterm infants, stimulate the secretion of gastrin and motilin, and enhance gastric motility; OS can improve the sucking reflex of preterm infants and reduce the transition time from tube feeding to oral feeding [7-8]. However, oral motor training also has limitations. Some reports indicate that prolonged NNS can cause nausea and lead to vomiting in infants [9].

The “Healthy China 2030” plan outline states: “We should give full play to the unique advantages of traditional Chinese medicine, enhance the service capacity of TCM, and promote the mutual complementarity and coordinated development of traditional Chinese and Western medicine.” Under the guidance of this outline, Chinese researchers have increasingly sought to use TCM methods to address feeding intolerance in preterm infants in recent years. In traditional medicine research [10], herbal decoctions such as Simo Decoction and Sijunzi Decoction can improve feeding intolerance, but the preparation of herbal decoctions is time-consuming and costly, and they can easily cause adverse reactions in infants. Pediatric tuina, as one of the most commonly used external treatment methods in traditional medicine, has the advantages of minimal adverse effects and convenient operation. In recent years, inspired by the concept of “treating internal diseases externally” in the integration of Chinese and Western medicine, pediatric tuina has been widely used in the clinical treatment of diarrhea, abdominal pain, constipation, etc., achieving certain results. Therefore, this study will compare and analyze the efficacy of oral motor training alone versus oral motor training combined with pediatric tuina in treating feeding intolerance in preterm infants, to evaluate the advantages of this combined treatment strategy, hoping to provide a beneficial and innovative

reference therapy for the clinical treatment of feeding intolerance in preterm infants and to expand new ideas for the application of integrated traditional Chinese and Western medicine in neonatology.

2. Objects and Methods

2.1 Research Objects

The subjects of this study were preterm infants, all sourced from the Department of Neonatology of a tertiary grade A hospital in Jinan City. Seventy-five preterm infants admitted in 2022 were selected as the experimental group, and 60 preterm infants admitted in 2020 were selected as the control group. Inclusion criteria: 1) Infants meeting the above diagnostic criteria for feeding intolerance. 2) Infants who had not received medication or other treatment methods for feeding intolerance symptoms before entering the clinical trial. 3) Infants with gestational age <37 weeks, birth weight <2500 g, and admitted to the hospital's NICU within 24 hours after birth. Exclusion criteria: 1) Infants with severe congenital defects of the digestive system. 2) Infants with respiratory diseases, such as neonatal asphyxia. 3) Infants combined with dysfunction of other systems such as circulatory, nervous, or urinary systems. 4) Infants with skin problems or intolerance to pediatric tuina. 5) Infants with congenital oral deformities.

There is currently no internationally unified diagnostic standard for feeding intolerance in preterm infants. Based on domestic and foreign literature [11-15] and clinical practice, the diagnostic criteria for feeding intolerance in preterm infants were formulated as follows: 1) Poor feeding performance, gastric residual volume exceeding 50% of the previous feeding volume, accompanied by vomiting or abdominal distension. 2) Inability to proceed smoothly with the feeding plan, including reduction, delay, or forced interruption of enteral nutrition. Meeting one of the above criteria, making it difficult for the preterm infant to transition smoothly to oral feeding, can be diagnosed as feeding intolerance.

2.2 Research Design

A non-simultaneous controlled clinical study design was used. Infants in the control group were admitted in 2020 and received oral motor training and routine basic care, including monitoring of ECG, blood pressure, and oxygen saturation, postural support during feeding, drug treatment as prescribed, parenteral nutrition, etc. Infants in the experimental group were admitted in 2022 and received pediatric tuina treatment in addition to the control group's intervention plan. The treatment and observation period was 7 days.

2.3 Intervention Methods

Before the trial procedures, potential adverse reactions during the trial should be explained to the infants' families, and their informed consent should be obtained. The nursing staff participating in this study had undergone standardized training in oral motor training and passed the assessment. Pacifiers of uniform specification were used during operation and disinfected by designated personnel. Pediatric tuina was performed by the same tuina therapist from the hospital's Rehabilitation Department according to the pediatric tuina prescription established for this study to ensure operational homogeneity.

2.3.1 Oral Motor Training Methods (performed by nursing staff)

2.3.1.1 Oral Stimulation (OS)

1) Cheek C-stretch: Perform 2 times per cheek, total time 30s. Method: Place one finger inside the cheek and one finger outside the cheek. Slide from the philtrum area from front to back, stretching towards the ear, then down and forward in a C-shape back to the starting point.

2) Lip gliding: Perform once on the upper lip and once on the lower lip, total time 30s. Method: Place the index finger inside the upper lip and the thumb outside the upper lip. Move the index finger horizontally, with the thumb moving in the opposite direction to the index finger, gliding the lips.

3) Lip curling or lip stretching: Perform once on the upper lip and once on the lower lip, total time 30s. Method: Place one finger outside the upper lip and one finger inside the upper lip. Gently press the lip and stretch the upper lip downward along the midline. Use the same method for the lower lip, stretching it upward.

4) Gum massage: Perform 2 times, total time 30s. Method: Place the finger on the center of the upper gum. Using constant, sustained pressure, move slowly and gently towards the back of the upper gum. Move from the back of the upper gum to the back of the lower gum, then slowly and gently to the center of the lower gum, and then to the opposite side, forming a circle.

5) Stimulating the lateral border of the tongue or inside the cheek: Perform 2 times, total time 30s. Method: Apply gentle pressure inside the cheek, pressing in a C-shape towards the molar gum level, then move back to the inside of the lip. Place the finger between the tongue border and the lower gum at the molar level. Using gentle force, slowly push the tongue towards the opposite side, immediately move the finger back, and gently press the finger towards the infant's cheek.

6) Massaging the mid-tongue and palate: Perform 2 times, total time 30s. Method: Place the index finger in the center of the oral cavity. Move the finger down to the center of the tongue. Using gentle, sustained pressure, slowly press down on the tongue. Then move to the center of the hard palate and press.

2.3.1.2 Non-Nutritive Sucking (NNS).

1) Gently stimulate the palate for 15 seconds to elicit sucking.

2) Provide a rubber pacifier for sucking for 2 minutes.

Infants received both OS and NNS twice daily, at 9:00 AM and 3:00 PM, 15–30 minutes before feeding, for 7 days.

2.3.2 Pediatric Tuina Methods (Performed by a professional therapist)

For the treatment of feeding intolerance in preterm infants, the fundamental pathogenesis was addressed based on the physiological characteristic of preterm infants having a "constitutionally deficient spleen" (脾常不足). The treatment principle focused on strengthening the spleen and promoting its transporting function (健脾助运), as well as harmonizing the spleen and stomach (调和脾胃). Based on long-term clinical experience, the pediatric tuina prescription for this study was established. The prescription comprised the following techniques: Reinforcing the Spleen Meridian (补脾经), Clearing the Large Intestine (清大肠), Clearing the Stomach Meridian (清胃经), Kneading Banmen (揉板门), Rubbing the Bagua (Eight Trigrams) clockwise (顺运八卦), Rubbing the abdomen (摩腹), and Pressing and Kneading Zusanli (ST36, 足三里), Hegu (LI4, 合谷), and Tianshu (ST25, 天枢). Infants in the experimental group received tuina once daily for 7 days.

2.4 Data Collection

2.4.1 General Information of Preterm Infants

Included the preterm infant's admission year, name, gender, hospitalization number, admission diagnosis, birth weight, and Apgar score.

2.4.2 Observation Indicators

Primary outcome measures included:

1) Vomiting status of preterm infants, i.e., whether vomiting still occurred after 7 days (1 cycle) of treatment.

2) Time to first oral feeding, i.e., the corrected gestational age when the preterm infant first attempted oral feeding after birth.

3) Gastric tube indwelling time, i.e., the duration for which the preterm infant relied on gastric tube feeding.

4) Increase in milk volume, i.e., the extent of increase in the infant's milk intake due to improved intestinal function, recording the increase in prescribed milk volume on day 3 and day 7 of the trial respectively.

Secondary outcome measures included:

1) Time to initiation of feeding, i.e., the corrected gestational age when feeding was started for the preterm infant.

2) Time to complete meconium passage, i.e., the corrected gestational age when the preterm infant completely passed meconium (the first stool passed after birth).

3) Time to regain birth weight, i.e., the corrected gestational age when the preterm infant's body weight returned to the level at birth.

4) Incidence of gastric residuals. Gastric residual refers to undigested food remaining in the stomach after feeding. Gastric residual measurement time was before feeding. The measurement method was to gently aspirate the residual milk volume in the infant's stomach through the gastric tube using a sterile syringe before feeding. When the residual volume exceeded 50% of the previous feeding volume, it was recorded as a gastric residual occurrence, and the incidence rate of gastric residuals among subjects was calculated.

5) Length of hospitalization, i.e., the number of days from birth to discharge.

2.4.3 Safety Indicators

Before intervention, medical staff comprehensively assessed the preterm infants in the experimental group. During the intervention process, vital signs of the preterm infants needed to be observed and recorded, and intervention time was strictly controlled.

During the intervention, adverse events such as choking on milk, skin damage, and apnea were observed. Based on the severity of adverse events, it was evaluated whether the infant should discontinue or withdraw from the trial.

2.5 Statistical Analysis

SPSS 25.0 software was used for statistical analysis of the obtained data. Quantitative data were expressed as mean ± standard deviation ($\bar{\chi} \pm s$). For quantitative data conforming to normal distribution, inter-group comparisons were performed using the t-test; for those not conforming to normal distribution, the Wilcoxon rank-sum test was used. Qualitative data were expressed as frequency (percentage), and inter-group comparisons were performed using the χ^2 test. $P<0.05$ was considered statistically significant.

3. Results

3.1 General Information

A total of 135 subjects were included in this study, with 60 in the control group and 75 in the experimental group. Comparisons between the two groups of preterm infants in terms of postnatal age, gender, birth weight, and Apgar scores at 1 min, 5 min, and 10 min showed no statistically significant differences ($P>0.05$), indicating good comparability between the experimental and control groups (Table 1).

Table 1: Comparison of baseline characteristics

Item	Control group (n=60)	Experimental group (n=75)	$\chi^2/t/Z$ value	P value
Age/min	41.58±9.19	42.93±13.03	-0.687[1]	0.066
Birth weight/kg	1.64±0.57	1.65±0.61	-1.200[1]	0.100
Gestational age/week	30.16±1.81	30.91±2.80	-1.784[1]	0.065
1-minute Apgar score	8.27±1.69	7.85±1.89	1.342[2]	1.000
5-minute Apgar score	9.12±0.99	9.01±1.06	0.583[2]	0.866
10-minute Apgar score	9.33±0.80	9.39±0.90	-0.365[2]	0.283
Gender/n (%)			1.929	0.171
Male	28 (46.7)	44 (58.7)		
Female	32 (53.3)	31 (41.3)		

Note: 1.t value; 2.Z value.

3.2 Safety Analysis

No adverse events such as unstable vital signs, choking on milk, apnea, or skin damage occurred in either group during the intervention. During the pediatric tuina process, there was transient local skin redness, but no ulceration or bleeding occurred. No infants withdrew or dropped out.

3.3 Comparison of Treatment Effects

3.3.1 Comparison of Feeding Performance between Experimental and Control Groups

The researchers assessed and recorded the manifestations of feeding intolerance, such as vomiting and gastric residue, in the experimental group infants after 7 days of treatment. Relevant information for the control group was obtained by reviewing medical and nursing records. Data showed that the occurrence of vomiting and gastric residue in the experimental group preterm infants was better than that in the control group. By comparing the time to initiation of feeding, time to first oral feeding, gastric tube indwelling time, and the increase in prescribed milk volume on day 3 (D3) and day 7 (D7) after treatment initiation between the two groups, it was found that the time to first oral feeding and gastric tube indwelling time in the experimental group were both about one week earlier than those in the control group. The increase in prescribed milk volume on D3 and D7 after treatment initiation in the experimental group was higher than that in the control group. All the above differences were statistically significant. These results indicate that oral motor training combined with pediatric tuina is superior to oral motor training alone in improving the feeding performance of preterm infants (Table 2).

Table 2: Comparison of feeding performance between the two groups

Item	Control group (*n*=60)	Experimental group (*n*=75)	$\chi^2/t/Z$ value	P value
Vomit/n(%)			8.584	0.003
No	35 (58.3)	61 (81.3)		
Yes	25 (41.7)	14 (18.7)		
Gastric residue/*n*(%)			15.418	0.000
No	23 (38.3)	54(72.0)		
Yes	37 (61.7)	21 (28.0)		
Feeding initiation time/week	31.02±1.75	30.80±2.41	0.593[1]	0.551
First oral feeding time /week	34.43±1.48	32.84±2.26	4.722[1]	0.000
Gastric tube retention time/d	26.58±14.24	15.87±9.92	5.144[1]	0.000
Increased milk volume-D3/mL	2.98±1.61	7.12±7.77	-4.053[2]	0.000
Increased milk volume-D7/mL	4.95±2.43	9.71±8.78	-4.071[2]	0.000

Note: 1.t value; 2.Z value.

3.3.2 Comparison of Body Weight and Hospitalization Days between Experimental and Control Groups

The researchers measured and recorded the time to regain birth weight, body weight on day 3 and day 7 after treatment, and length of hospitalization for both the experimental and control groups. It was found that there was no statistically significant difference between the two groups in the time to regain birth weight. However, the body weight of infants in the experimental group on day 3 and day 7 after treatment was higher than that of the control group at the same time points, showing a better trend in weight gain. The average length of hospitalization for infants in the experimental group [(39.57 ± 22.78) d] was significantly shorter than that of the control group [(65.98 ± 42.37) d], and the difference was statistically significant (Table 3).

Table 3: Comparision of weight and days of hospitalization between the two groups

Item	Control group (*n*=60)	Experimental group (*n*=75)	*t/Z* value	P value
Recovery time of birth weight/week	32.47±1.42	32.28±2.85	0.461[1]	0.646
Weight-D3/kg	1.29±0.33	1.85±0.67	-5.922[2]	0.000
Weight-D7/kg	1.33±0.33	2.00±0.73	-6.643[2]	0.000
Days of hospitalization /d	65.98±42.37	39.57±22.78	4.629[1]	0.000

Note: 1.t value; 2.Z value.

4. Discussion

The incidence of feeding intolerance in preterm infants in China is 15.70%–53.45% [2,16-18]. The occurrence of feeding intolerance not only affects the time to achieve full enteral feeding in preterm infants but can also severely complicate conditions like necrotizing enterocolitis, ultimately affecting the growth, development, and prognosis of preterm infants. Current published research focuses more on either oral motor training alone or pediatric tuina alone, with fewer studies exploring their combined effect. In this study, oral motor training combined with pediatric tuina significantly reduced the occurrence of symptoms such as vomiting and gastric residue in preterm infants with feeding intolerance, and shortened the time to first oral feeding and gastric tube indwelling time, which is consistent with the results of Liu Hui, Peng Zuqin, et al. [17-19]. This indicates that the combined therapy of oral motor training and pediatric tuina is more conducive to restoring oral motor function and promoting the recovery of intestinal function in preterm infants compared to oral motor training alone, and has a positive impact on the early growth and development of preterm infants. In this study, oral motor training combined with pediatric tuina did not effectively shorten the time to initiation of feeding in preterm infants. However, the study by Fucile et al. [20] showed that oral motor training can shorten the feeding process. This discrepancy may be related to factors such as the selection of more severely ill preterm infants in our trial and varying efficacy of tuina among different infants.

The increase in milk volume helps assess the degree of improvement in the feeding status of preterm infants brought about by the treatment method, reflecting the infant's ability to intake nutrients during the treatment process and the recovery of their gastrointestinal function, and can also indirectly reflect the infant's adaptability and tolerance to the treatment. Weight gain is also one of the important indicators for assessing the growth and development status of preterm infants and is a key factor in measuring treatment effectiveness. To promote weight gain in preterm infants, some researchers have applied oral motor intervention training combined with oral acupoint stimulation to preterm infants, with significant clinical efficacy [19,21]. In this study, oral motor training combined with pediatric tuina resulted in a significant short-term increase in milk volume and a

significant increase in body weight during and after treatment in preterm infants, consistent with the research results of Fucile et al. [20]. This indicates that the combined therapy, compared to oral motor training alone, can better promote the coordination and rhythm of the suck-swallow-breathe function in preterm infants, help increase nutrient intake, improve feeding efficiency, enhance the tolerance of preterm infants to treatment and feeding, thereby promoting weight gain in preterm infants [18].

Preterm infants can generally be discharged within 7 days after achieving full oral feeding. This study showed that the length of hospitalization for preterm infants after combined treatment was shorter than that for preterm infants receiving only oral motor training, consistent with the research results of Liu Hui, Peng Zuqin, et al. [17-19]. However, it should be noted that due to sample size limitations, data from a few preterm infants with excessively long hospital stays in the control group interfered with the results to some extent, increasing the difference in hospitalization days between the control and experimental groups. Nevertheless, the existing data can still reflect the positive significance of the combined therapy of oral motor training and pediatric tuina in shortening the length of hospitalization, which can help preterm infants recover faster. Meanwhile, early discharge can also reduce the medical burden on families and lower rehabilitation costs.

In summary, relying on the “integration of medical and nursing care” feature provided by the research hospital, this study incorporated clinical therapists as executors of the treatment intervention. By adopting the comprehensive treatment method of oral motor training combined with pediatric tuina, responding to the call of the “Healthy China 2030” plan outline to “strengthen the integration of traditional Chinese and Western medicine,” and following the guiding ideology of TCM’s “treating internal diseases externally,” this study explored the therapeutic effect of oral motor training combined with pediatric tuina on feeding intolerance in preterm infants. Compared with traditional therapies, the combined treatment has advantages such as significant short-term efficacy, safety, and simplicity, and can be promoted and applied as a new therapy in the clinical treatment of feeding intolerance in preterm infants.

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References

[1] TANG J. Feeding intolerance in premature infants: an important clinical problem[J]. Chinese Journal of Perinatal Medicine, 2020, 23(3): 177-181.
[2] ZHENG S Y, LUO Y Y. Clinical manifestations and related factors of feeding intolerance in premature infants[J]. Chinese Journal of Child Health Care, 2023, 31(4): 461-464.
[3] LI Y H, SU Z Z, SHAO H Y. Effect of non-nutritive sucking combined with oral massage stimulation on oral feeding of preterm infants[J]. Modern Diagnosis & Treatment, 2019, 30(10): 1775-1776.
[4] SUKWANICHAI P, BOONKASIDECHA S, MONTAKANTIKUL P, et al. Efficacy comparison between oral erythromycin versus domperidone for the treatment of feeding intolerance in preterm neonates[J]. Pediatr Neonatol, 2021, 62(5): 543-549.
[5] XU D M, LIN M, HUANG Z R, et al. Effects of breast milk olfactory stimulation combined with non-nutritive sucking on feeding of premature infants[J]. Journal of Nursing Science, 2022, 37(15): 28-31.
[6] CAKA S Y, TOPAL S, YURTUTAN S, et al. Effects of kangaroo mother care on feeding intolerance in preterm infants[J]. J Trop Pediatr, 2023, 69(2): fmad015.
[7] BABITHA D, APPAJI S. Effectiveness of oral stimulation on improving sucking reflex among pre-term infants[J]. Asian J Nurs Educ Res, 2021, 11(1): 25-27.
[8] DA ROSA PEREIRA K, LEVY D S, PROCIANOY R S, et al. Impact of a pre-feeding oral stimulation program on first feed attempt in preterm infants: double-blind controlled clinical trial[J]. PLoS One, 2020, 15(9): e0237915.
[9] LIU J Z, ZHANG Y, LIU D, et al. Oral stimulation combined with non-nutritive sucking to improve feeding in preterm infants: a meta-analysis[J]. Chinese Journal of Neonatology, 2022, 37(3): 258-264.
[10] YE S, WEI C H, CHEN Q. Clinical study on Simo decoction for treatment of feeding intolerance of near term infants[J]. Chinese Journal of Information on Traditional Chinese Medicine, 2018, 25(11): 27-30.
[11] CHANG X, WANG L, FENG X F, et al. Clinical efficacy of chiropractic combined with abdominal massage for feeding intolerance in premature infants[J]. Chinese Pediatrics of Integrated Traditional and Western Medicine, 2020, 12(6): 565-567.
[12] SONG S, CHEN F, FU Y H. Effect of oral exercise training combined with non-nutritive sucking on infant swallowing dysfunction[J]. Journal of Clinical and Pathological Research, 2022, 42(5): 1093-1098.
[13] MOLICA S, PATTI C, SPORTOLETTI P, et al. p664: grading quality of evidence and strength of recommendations for the treatment of relapsed / refractoryCLL[J]. HemaSphere,2022,6: 562-563.
[14] Evidence-Based Medicine Group, Neonatologist Society, Chinese Medical Doctor Association. Clinical guidelines for the diagnosis and treatment of feeding intolerance in preterm infants (2020)[J]. Chinese Journal of Contemporary Pediatrics, 2020, 22(10): 1047-1055.
[15] LI M M, SI Z X, LIU J, et al. Evidence summary for prevention and management of feeding intolerance in preterm infants[J]. Chinese Journal of Nursing, 2020, 55(8): 1163-1168.
[16] SUN X, HU X S, LIU F, et al. Clinical features and influencing factors of feeding intolerance in premature infants[J]. Chinese Journal of Child Health Care, 2023, 31(1): 109-112.
[17] LIU H, ZHANG S L, YUAN H, et al. Effectiveness of acupoint massage combined with oral motor intervention in the prevention and treatment of feeding intolerance in preterm infants[J]. Modern Medicine Journal of China, 2021, 23(5): 91-94.
[18] HUANG X, CHEN Q, PENG W T. Clinical characteristics and risk factors for feeding intolerance in preterm infants[J]. Journal of Central South University (Medical Science), 2018, 43(7): 797-804.

[19] PENG Z Q. Clinical study of acupoint massage combined with oral exercise intervention in improving sucking and swallowing dysfunction of premature infants[D]. Luzhou: Southwest Medical University, 2023.
[20] FUCILE S, GISEL E G, LAU C. Oral stimulation accelerates the transition from tube to oral feeding in preterm infants[J]. J Pediatr, 2002, 141(2): 230-236.
[21] DING Y, TANG Y F, ZHOU M. The effect of non-nutritive sucking combined with acupoint facial-oral stimulation on the growth and development of preterm infants[J]. Modern Nurse, 2022, 29(8): 54-56.