ISSN 2616-5791 Vol.5, Issue 9: 6-11, DOI: 10.25236/AJMHS.2024.050902

The Curative Effect Analysis of OPT Oral Muscle Positioning Therapy Combined with Oral Acupoint Pressing on Improving the Speech Intelligibility of FAD Children

Chong Yang, Yuan He, Ming Gao[a,*]

Xi 'an Hospital of Traditional Chinese Medicine Encephalopathy, Xi 'an, China
[a]18240882936@168.com
[*]Corresponding author

Abstract: *This study aims to investigate the clinical efficacy of OPT combined with oral muscle localization therapy in improving voice intelligibility in children with functional disorders. In the study, 108 children who were medical examination in our hospital from September 2022 to March 2023, who met the Diagnostic criteria for FAD were selected as the study objects. And they were randomly divided into treatment and control group with 54 patients in each group. The control group used traditional voice training, and on the basis of the control group, lianquan point and Hegu point were selected for the treatment of oral acupoint point pressing and oral muscle positioning. After two courses of treatment (2 weeks), the voice intelligibility and improvement were assessed the oral motor function. The results showed that after two courses of treatment, the treatment score of the oral motor function scale was significantly higher than that of the control group (P <0.05), the score of the voice intelligibility sciale was significantly higher than the control group (P <0.05), so it was concluded that OPT oral muscle localization therapy combined with oral acupoints was significantly effective on improving the speech clarity in children with FAD.*

Keywords: *OPT, functional articulation disorder, acupoint pressing, the speech intelligibility*

1. Introduction

Functional dysarthria (Functional Articulation Disorder, FAD) is the common language disorder of children, which appeared in pre-school and school age children. It refers to the organ of articulation without structural and functional abnormalities and the language development has reached the level of children over 4 years old, but there are sound errors and a fixed state[1]. The incidence results of FAD at home and abroad are widely divergent. According to relevant foreign literature, the prevalence rate of FAD children aged 3 to 7 years is very high, which can reach more than 10%[2]. However, in China, the researchers reported that the prevalence rate of FAD in the 4 to 6 years old group was about 0.78%, and another was 2.41%[3]. Children with FDA not only influence their daily communication, but also normal psychological development, and even peer relationship tension, learning difficulties and other phenomena. Due to the different wrong types of the disease and the different performance types of the pronunciation sites,thus, most of the treatment is based on the traditional pronunciation training. Now, 108 cases of FAD admitted to our hospital who are taken as the research object to observe the improvement of speech clarity of children with functional articulation disorder according to the precise positioning of oral acupoint points.

2. Data and methods

2.1 General information

A total of 108 eligible FAD children admitted to our hospital from September 2022 to March 2023 which were included in the study, aged from 4 to 6 years, with an average (5.03 ± 0.60) years. In this study, 108 cases were randomly divided into comparative group and treatment group, 54 patients respectively. The comparative group received traditional voice training, including 35 male and 19 female; aged 4.0-5.6 years, average age (4.94 ± 0.49); the treatment group received oral acupoint pressing and

ISSN 2616-5791 Vol.5, Issue 9: 6-11, DOI: 10.25236/AJMHS.2024.050902

precise positioning, including 34 male and 20 female, aged 4.0-6.0 years, average age (5.11 ± 0.69); compared the general data before treatment (age, gender, functional articulation disorder) (P value> 0.05), without any statistical significance. Table 1.

Table 1: Comparison of general data between the two groups

group	n	Sex (Male / female)	Age (year) (x±s)	Degree of dysarthria (example) Mild, moderate, and severe
Comparative group	54	35 19	4.94±0.49	20 25 9
Treatment group	54	34 20	5.11±0.69	18 28 8
t		0.67	1.45	0.79
p		>0.05	>0.05	>0.05

2.2 Diagnostic criteria: Fit for functional disorder[4]

1) There are no abnormalities in the morphology of the articulatory organs, with no cleft palate, malocclusion, or severe ankyloglossia present. 2) There are no abnormalities in the motor function of the articulatory organs, with no conditions such as cerebral palsy or congenital soft palate paralysis. 3) Hearing is normal, but mild to moderate hearing loss and high-frequency sudden deafness should be ruled out; impairments in the high-frequency range, particularly for consonants, can often lead to articulation errors. Care should be taken to exclude these causes. 4) If there are articulation errors but language development is generally at or above the level of a 4-year-old, these errors have become established. If a child's age is below 4 years and there are incorrect speech sounds, they can also be viewed as immature pronunciations due to developmental factors. Currently, both domestic and international research often adopts the standards set forth by the Japanese Speech-Language-Hearing Association. According to the standards established by the Japanese Association of Hearing and Speech, the diagnosis of children's functional articulation disorders must meet the following conditions: no morphological abnormalities in the articulatory organs, normal motor function of the articulatory organs, hearing within the normal range, language development at the level of 4 years or older, and articulation errors demonstrating a fixed state (symptoms persisting for more than six months).

2.3 Inclusion criteria

1) Normal hearing; 2) IQ above 90 as assessed by Wechsler Infant Intelligence Scale (C-WlSC); 3) Language development level above four years or above; 4) Parents and other caregivers reported no abnormal behavior; 5) Excluded motor or organic disorder; 6) Children with fixed mispronunciation, and the symptoms remained more than half a year; 7) The study must meet the requirements of the Ethics Committee[5] of Xi'an Hospital of Traditional Chinese Medicine Encephalopathy.

2.4 Exclusion criteria

1) Cerebral palsy; 2) neurological diseases; 3) incomplete case data record; 4) Dropouts from voice therapy, and treatment programs were interrupted for more than 4 consecutive days

2.5 The criteria for determining the severity degree of functional disorder[6]

The mild: slurred in very few words; The moderate: more words; The severe: inaccurate. inaccurate in most pronunciations.

2.6 Methods

Both the comparative group and the treatment group underwent traditional speech therapy. The training methods is: practice correct pronunciation, consolidate it and correct pronunciation movements to other pronunciation generalization. The treatment group conducted the oral acupoint point pressing and the combination of oral precision treatment on the basis of the comparative group. Each treatment lasted 30 minutes, 5 sessions per week for 1 month (2 sessions).

When performing traditional speech therapy, therapists often use the combination of visual and auditory mode to give children phonological training. Patients can see their mouth in the mirror or listen

ISSN 2616-5791 Vol.5, Issue 9: 6-11, DOI: 10.25236/AJMHS.2024.050902

to their own recordings, and then gradually transit from monosyllables to words and sentences, and then practice repeatedly. Take the common "de ge" issued as "de de" as an example, the speech therapist will press the tongue plate against the front of the child's tongue, and push the tongue back to the soft palate to send the "g" sound and feel the correct pronunciation position and way, and then correct the patient to practice repeatedly, in order to achieve the purpose of strengthening the pronunciation. On this basis, the treatment group was given oral acupoint pressing combined with oral precise treatment. In the acupoint time, Lianquan point was selected in combination with Dumen point and Hegu point; the therapist applied the acupoints of Lianquan, Dummmen and Hegu with the combination of point method and press method when the children were placed in the supine or sitting position.The treatment time and frequency were 3mins per point, 20 seconds each time, once a day. After ten mins of acupoint pressing,we can adopt the precise positioning treatment according to the reaction degree of the children.Thereby, we can adjust the intensity and manipulation.For pronunciation positioning training, jaw control, tongue stimulation and phonological training which can be developed according to the similarity of pronunciation methods and characteristics. For example, the mutual influence and promotion of similar sounds [g], [k] and [h]. During the process, the tongue pressing plate or cotton swab can be used to stimulate the tongue root and soft palate to achieve precise positioning; the extrusion and tongue resistance movement can assist pronunciation through the phonemic sound.

2.7 Observation and judgment criteria of efficacy

The oral motor function scale [7] was used to evaluate the tongue, lip, and jaw motor function of the children.All of them were performed in two states of natural relaxation and mouth movement There were 33 sub-items in the assessment scale, including 9, 8 and 15 items of lower tongue, jaw, lip and mouth motor function respectively;each item was graded 0 to 4 (5 levels),those were scored 0 to 4 points, with a full score of 132.The higher scores indicates the better mouth movement function.(2) Speech inspection: It measures speech clarity scale, pronunciation clarity: 60% is poor, 60%~74% is medium, 75%~90% is good, more than 90% is excellent.(3) Determination criteria include: Ineffectiveness: there was no improvement in the clinical symptoms of functional dysarthria after receiving professional treatment in the treatment group; effectiveness: the clinical symptoms improved significantly; healing: all mispronunciation was corrected [8], and the clinical symptoms were eliminated; (4) total clinical effectiveness = healing + effectiveness.

2.8 Statistical methods

Statistical analysis was performed by using statistical software SPSS19.0. All data including age, sex, and degree of disorder were normal, if P <0,0.05.

3. Results

3.1 Comparison of efficacy of oral motor function

After examination, the results of the oral motor function scale in both groups were normally distributed. Analysis was performed using an independent sample t-test. There was no significant difference in the scores between the two groups (P> 0.05); After treatment, the scores of oral motor function scale were lower than those before treatment. And the treatment group scored significantly lower than that of the control group. The difference was statistically significant (P <0.05). Compared with the pre-treatment and post-treatment, there was no statistically significant difference in oral motor function scale scores between the two groups of pre-treatment (P> 0.05). On the contrary, (P <0.05), it is statistically significant .This suggests that oral motor function improved in both groups after treatment,.and the improvement of the treatment group was more obvious than that of the control group.Relevant data are detailed in Table 2.

Table 2: Comparison of efficacy before and after treatment with oral motor function

group	lower jaw		lip	
	Pre-therapy	Post-treatment	Pre-therapy	Post-treatment
Control group (n=54)	64.98±11.35	73.59±11.21	76.51±6.57	85.46±5.01
Treatment group (n=54)	64.87±11.28	79.56±9.02	78.09±3.50	90.05±2.81
t	0.77	23.35	0.26	7.21
p	0.54	0.01	0.79	0.01

ISSN 2616-5791 Vol.5, Issue 9: 6-11, DOI: 10.25236/AJMHS.2024.050902

Table 2: Continuing table

group	tongue		ensemble	
	Pre-therapy	Post-treatment	Pre-therapy	Post-treatment
Control group (n=54)	68.93±5.52	78.58±6.47	119.87±2.45	123.35±2.57
Treatment group (n=54)	68.34±5.10	84.03±5.26	118.79±2.36	129.35±1.08
t	0.26	15.98	1.37	13.63
p	0.79	0.02	0.18	0.01

3.2 Comparison of efficacy of speech clarity scale

After examination, the results of the speech clarity scale in both groups were normally distributed. Analysis was performed using an independent sample t-test. There was no significant difference in pre-treatment speech clarity scale scores between the two groups (P> 0.05); After treatment, the scores of speech clarity scale were lower than the pre-treatment, and the score of the treatment group was significantly lower than that of the control group. Thus, the difference was statistically significant(P <0.05). By comparing the results pre-treatment and post-treatment, the scores of speech clarity scale between the control and treatment groups were not statistically significant (P> 0.05).However, the difference in the two scores was statistically significant (P <0.05), which indicates that both groups of children had improved speech intelligibility after treatment. The improvement of the treatment group was more obvious than that of the control group. Detailed data are detailed in Table 3

Table 3: Comparison of voice clarity before and after treatment (%)

group	Pre-therapy	Post-treatment
Control group (n=54)	59.32±12.70	65.04±11.71
Treatment group (n=54)	57.89±11.68	81.20±13.34
T	1.37	19.63
p	0.32	0.01

3.3 Comparison of clinical efficacy

After one month of intervention, the data statistics and analysis of the treatment effect of the two groups concluded that the two groups were cured, effective and ineffective. This indicated that both groups were effective after the intervention, and that the total clinical response rate in the treatment group was significantly higher than that in the control group, and the difference was statistically significant (P <0.05). Clinical effective rate = (cure + effective) 100%, see Table 4 for detailed data

Table 4: Comparison of clinical efficacy after treatment

group	Treatment effect (example)			total effective rate
	The cure is effective and ineffective			(%)
Control group (n=54)	24	18	12	77.8
Treatment group (n=54)	38	12	4	92.5
$\chi 2$				6.91
p				0.03

4. Analysis and discussion

The functional articulation disorder is a common language disorder of children. The symptoms of its performance are blurred speech and unclear speech. It not only has a great impact on children's daily communication, but also leads to the decline of their social life ability and the impairment of physical and mental health development. Formation of speech is an extremely complex process. It involves respiration, vocalization, vocalization, and prosody, which not only requires good pulmonary and pharyngeal (vocal cord) function, but also depends on the functional integrity of the central and peripheral nervous systems, cranial nerves, and the muscles involved in speech production[9]. OPT is a physical movement for speech expression and eating. It aims to affect the oral pharyngeal jaw mechanism of physiology, mainly through the mouth muscle tools and mouth muscle training intervention perceptual stimulation,, which not only can improve the lips, jaw, tongue, soft jaw, throat and respiratory muscle

ISSN 2616-5791 Vol.5, Issue 9: 6-11, DOI: 10.25236/AJMHS.2024.050902

activity, the patient mouth muscle function to the best level, but can accurately locate each sound pronunciation position. Consequently, the patient pronunciation clarity will achieve the best. Lay a solid foundation for traditional pronunciation training to improve speech clarity, enhance and improve the effectiveness and efficiency of speech therapy. It is of great significance to strengthen the rehabilitation training of children with functional dysthria and continuously improve the effect of children to ensure the healthy growth of children[10].

Oral functional training is a common clinical intervention methods currently[11]. The advantages of OPT oral muscle positioning therapy which combined with oral acupoint massage in the intervention of articulation in FAD children lies in: the former can solve the problems those children with functional articulation disorder, such as tongue coordination, oral muscle tension, and changes in tongue position; the later combined with acupoint massage, which can exercise facial muscles, relax masseter muscle, explore the stimulation of tongue, the emission and sucking reflexes; we can promote oral muscle by stimulating the lip and oral reflex. Thus, the function of the articulation organ and the tension of the oral muscles can influence the clarity of pronunciation. Analysing the reason: the coordination of tongue muscles, the tone of oral muscles, and the changes in tongue position in children with functional disorders can all affect the pronunciation clarity. As you get older, normal children's lip and tongue movements were separated from the jaw movements[12], the symptoms were improved. In the study, the treatment group used precise positioning combined with academic points to treat the speech clarity of functional disorders, and the total effective rate was 92.5%, which was better than conventional speech training. The treatment group selected three points of Lianquan point with Dumbgate cave, Hollow bearing point for point pressing. Lianquan point, alias Tongue point, is the meeting of conception vessel and Yin vessel, with other two points to cure the unclear language[13]. It can confront muscle movement, tongue stability, relaxation, flexibility. In the precise positioning of the mouth, flexing facial muscles, slacking off mouth and lip muscles, exploring emission, sucking up reflex, tongue stimulation and massaging can promote the development of mouth muscles, stimulate the mouth and lip reflex, and promote the expansion of it. Tongue depressor assisted pressing method and Tongue base assisted lifting method are suitable for children with pronunciation error and irritation (when setting in shape), there is consistency in the mispronunciation. Comparing the oral motor function (lip, tongue, jaw, and overall), speech clarity and the efficacy evaluation criteria of functional disorder between the treatment group and the control group, the efficacy of the former was significantly higher than that of the latter.

To sum up, the ways of OPT oral muscle positioning therapy combined with oral acupoint massage that can improve the oral sensation of children with FAD. It also can improve the stability of the jaw, enhance the chewing ability, coordinate the flexibility and movement ability of the lips, tongue and jaw,then the motor pattern of oral-facial nerve gradually maturates. Oral sensation and exercise are the core of speech training. The combination of them can promote the development of sensation of mouth and oral motor function obviously, and ultimately improve the articulation of children. A new method and idea are explored to improve the clarity of the speech of children with functional disorder. The intervention of children with FAD can improve the clarity of children with functional articulation disorder more effectively. Due to the small number of cases in this study, continuous summary, learning and exploration are needed in the treatment process.

5. Conclusion

This study conducted a clinical trial involving 108 children with FAD, utilizing a random number table method for grouping. The results indicated that OPT oral muscle positioning therapy combined with acupoint massage could enhance the oral motor function and speech clarity of children with FAD. The comparison between the treatment group and the control group yielded statistically significant results, with no adverse reactions reported. Clinical efficacy research showed that both groups of children exhibited improvement in speech clarity after treatment, with the treatment group demonstrating a more pronounced enhancement that was significantly greater than that of the control group. Beginning with clinical practice, this study employed a method that combined acupoint massage OPT with oral muscle positioning training, which not only improved the children's oral perception and the motor abilities of their articulatory organs but also enhanced mandibular stability, forming a mature oral neuro-motor pattern. Additionally, it increased the speech clarity and social quality of children with FAD, facilitating their smooth reintegration into school life. Furthermore, the combination of acupoint massage and OPT oral muscle positioning therapy proved effective in significantly improving the speech clarity, tongue movement, and coordination of oral muscle groups in children with FAD. Speech therapists found the treatment process to be straightforward, with high cooperation from the children and easy acceptance by parents. Moreover, acupoint massage, as a form of traditional Chinese therapeutic massage, is safe,

ISSN 2616-5791 Vol.5, Issue 9: 6-11, DOI: 10.25236/AJMHS.2024.050902

reliable, and non-invasive, making it worthy of promotion and application in clinical practice.

References

[1] Jiang Liyan, Qi Fengfeng, Gao Pingping and so on. To study the pronunciation of finals phonemic pairs in young children with functional a articulation disorder [J]. Journal of Audiology and Speech Diseases, 2020,28 (04): 391-394.

[2] Zhao Yunjing. A case-control study on auditory discrimination in children with functional articulation disordera [D]. Chinese Medical Sciences University, 2003.

[3] Wan Guobin, Li Zhixiang. Epidemiological survey of developmental pronunciation disorders in children aged 4-16 years in Hunan Province [J]. Chinese Journal of Mental Health, 1996,10 (5): 197-8.

[4] Li Shengli. Speech therapy [M]. Beijing: People's Health Publishing , 2008:99-114.

[5] Lv Jing. Investigation of the effects of corporal punishment on special children [J]. Medical Information, 2019,32 (15): 126-128.

[6] Wu Minhua, Chen Dang, Wang Zhiqi. Study of tongue movements during speaking in Cantonese patients with abnormal dysarthria [J]. Journal of Rehabilitation, 2016,26 (5): 8-16.

[7] Hao Xinzheng, Hu Xiangyu, Zhang Xuye, etc. Efficacy of acupuncture combined with massage and language training for dysarthria in children of different ages [J]. Journal of Xinxiang Medical College, 2021,38 (10): 944-948.

[8] Feng Yaqin. Analysis of speech abnormalities and correction effects in children with functional dysarthria [J]. Shenzhen Journal of Integrated Traditional Chinese and Western Medicine, 2020, 30(19):90-91.1007-0893.2020.19.041

[9] Xu Linhong, Lin Hongfei, Qi Ruihua, et al. An emotional word representation model based on radicals and phones [J]. Chinese Journal of Information Technology , 2018,32 (6): 124-131.

[10] Li Ruiling. Contrast-type speech recognition between children with functional dysarthria and normal dysarthria [J]. Chinese Journal of Hearing and Language Rehabilitation Science, 2016,12 (2): 93-95.

[11] Chen Shaorong, Hong Jinstring. Application of oral training in dysarthria correction [J]. Jilin Medical Journal, 2010,31 (27): 4792.

[12] Li Ying, Li Hui, Shi Lihua. To investigate the efficacy of oral function training combined with home training for functional dysarthria [J]. Medical food therapy and Health, 2020,18 (07): 118 + 120.

[13] Huang Lixian, Qi Baoyun, Pei Xuemei, etc. Clinical observation of seven tongue injections combined with ear point pressure bean for the treatment of swallowing disorder after stroke [J]. Shanxi Traditional Chinese Medicine, 2017,33 (12): 24-25 + 27.