Study on the Clinical Effect, Mental Development and Social Function of Somatosensory Game Rehabilitation in Children with Autism

Xufeng Ma [1,2], Yazhou Song[1], Unzi Kim[1] *, Joonki Paik[1]*

1 Graduate School of Advanced Imaging Science, Multimedia and Film, Chung-Ang University, 06974, Korea,
2 Qingdao University of Science and Technology, 266061, China
*Corresponding Author

ABSTRACT. *Objective: To explore the effect of somatosensory play rehabilitation therapy in children with autism. Methods: From May 2019 to August 2020, 120 children with autism who were treated in this study were selected as the research objects. According to the random number table, they were divided into a control group (60 cases) and a study group (60 cases). The control group received Traditional comprehensive treatment, the research group gave somatosensory game rehabilitation treatment, and compared the clinical effects, mental development and social function of the two groups. Results: The PEDI (Child Ability Assessment Scale), mandibular, lip and tongue scores of the study group were higher than those of the control group (P<0.01); the study group CARS (children's autism assessment) and ABC scores were lower than the control group (P<0.01). Conclusion: The somatosensory game rehabilitation treatment of children with autism can effectively promote their mental development, enhance social function, and improve the treatment effect.*

KEYWORDS: *Somatosensory game rehabilitation, Autism, Mental development, Social function, Clinical effect*

1. Introduction

Symptoms of loneliness, also known as autism, is a mental development disorder. The core symptom is a disorder of social communication, accompanied by emotional and language disorders, narrow interests, and repetitive stereotyped behaviors [1-3]. Studies have pointed out that the application of somatosensory game rehabilitation therapy in children with autism has a significant effect, which is conducive to promoting mental development and improving social function [4-5]. In this study, from May 2019 to August 2020, 120 children with autism were treated as an example, and good results were achieved. The report is shown below.

2. Materials and Methods

2.1 General Materials

This study was approved by the Medical Ethics Committee and used the clinical data of 120 children with autism from May 2019 to August 2020. According to the random number table, they were divided into 60 control groups and 60 study groups. In control groups, there were 35 males and 25 females; duration of illness 5 months to 5 years, average (3.49±0.76) years; age 1.3-6.5 years, average age (3.57±1.13) years. In the study group, there were 33 males and 27 females; the course of disease was 6 months-4 years, with an average of (3.36±0.63) years; the age was 1.5-6.8 years, and the average age was (3.69±1.22) years. The comparison of age, disease course and other data between the two groups was not statistically significant (P>0.05).

2.2 Methods

The control group received traditional comprehensive treatment, including medication, cognitive and language training, etc. The research group gave somatosensory play rehabilitation therapy, the main measures are: ①Use games to attract children's attention, such as "graphic memory", "find the difference", "little chef", etc., to increase memory and understanding ability. ②Using methods such as "helping the tadpole to find a mother", "catch the butterfly", and "batting game" to enhance the children's self-awareness and emotional perception. ③Applying games such as "pet therapy", "helping the elderly cross the river", and Kinect adventure to improve the oral expression, group collaboration and communication skills of the children. ④Exercise the hand control, body balance and hand-eye coordination abilities of children with games, such as "cleaning windows", "playing football", etc., to improve their grasping ability.

2.3 Observation Indicators and Evaluation Criteria

The PEDI (Child Ability Assessment Scale) scale is used to evaluate the functional skill level of the two groups. The higher the score, the higher the level; the CARS (Child Autism Assessment) scale is used to evaluate the functional skills of the two groups. The severity of the disease and symptoms are scored, the higher the score, the more serious; the ABC (Autistic Behavior) scale is used to score the abnormal behaviors of the two groups, and the low score indicates fewer abnormal behaviors; the simple oral movement scale is used for the two groups The mandibular, lip, tongue and mouth motor functions are evaluated, and the higher the score indicates the better the oral motor ability [6]. In addition, the curative effects of the two groups were assessed, including indicators such as failure to understand instructions, low vocabulary, mixed use of words, not willing to actively talk to others, and lack of active language.

2.4 Statistical Methods

The research data is processed by SPSS21.0 software. The counting data is expressed by [n (%)] and tested by χ^2; the measurement data is expressed by ($\bar{x}\pm s$). After the t test, P<0.05 or <0.01 indicates that there is a difference statistical significance.

3. Results

3.1 Mental Development and Social Function Indicators of the Two Groups

The scores of each scale in the study group were better than those in the control group (P<0.01), see Table 1.

Table 1 Comparison of Mental Development and Social Function Indicators between the Two Groups

($\bar{x}\pm s$, points)

Group	PEDI	CARS	ABC
Study group(n=60)	83.63±9.75[a]	28.66±5.84[a]	30.72±8.60[a]
Control group(n=60)	76.11±10.43	35.88±6.26	40.23±9.16
t	4.0798	6.5325	5.8629
[a]P	<0.01	<0.01	<0.01

Note: compared with the control group, [a]P<0.01.

3.2 Comparison of Oral Movement Indexes between the Two Groups

The index of mandible, lips and tongue in the study group were higher than those in the control group (P<0.01), see Table 2.

Table 2 Two Groups of Oral Movement Indexes ($\bar{x}\pm s$, Points)

Group	Mandible	Lips	Tongue
Study group(n=60)	25.37±4.84[a]	27.48±4.27[a]	45.37±6.46[a]
Control group(n=60)	20.58±5.26	22.41±3.86	34.59±5.68
t	5.1907	6.8227	9.7072
[a]P	<0.01	<0.01	<0.01

Note: compared with the control group, [a]P<0.05.

3.3 Comparison of Efficacy between the Two Groups

The research group did not understand instructions in 12 cases, accounting for 20.00%; lack of vocabulary and mixed words in 18 cases, accounting for 30.00%;

lack of active language in 16 cases, accounting for 26.67%; not willing to actively talk to people in 21 cases, accounting for 35.00 %. There were 22 cases in the control group, accounting for 36.67%; 30 cases, accounting for 50.00%; 27 cases, accounting for 45.00%; 32 cases, accounting for 53.33%; respectively, the study group was significantly less than the control group (P<0.05, χ^2 =4.1040, 5.000, 4.3854, 4.0890).

4. Discussion

In recent years, the number of children with autism in my country has shown a continuous upward trend [7]. Autism is a lifelong disease with an incidence rate of about 1% in my country, and its personality characteristics are relatively obvious. Compared with normal children, children with autism will be relatively backward or abnormal in perception, feeling, and imagination, which will seriously affect physical and mental health and growth and development, and increase the burden on family and society [8]. The results of this study showed that the PEDI, CARS, ABC scale scores and efficacy indicators of the study group were better than those of the control group, and the scores of oral motor function were significantly higher than those of the control group. It shows that the application of somatosensory game rehabilitation therapy in children with autism can effectively promote mental development and social function, and enhance the therapeutic effect. Analyze the reasons and consider: the medical staff use cognitive and intelligence, emotion and consciousness, social and physical rehabilitation and other game modules to attract the attention of children. For example, in "Helping the tadpoles find their mothers", the children follow the prompts Mothers find out that they can stimulate their self-awareness, thereby improving their emotional performance and improving negative emotions; in "Helping the Elderly Cross the River", the children coordinate and communicate with their friends to help the elderly who cannot cross the river on their own, it can effectively enhance their ability of collaboration and communication, and improve the ability of language communication, expression and teamwork. Specifically, the somatosensory technology is a human-computer interaction technology, which mainly analyzes the user's actions through machine recognition, and then gives feedback according to a predetermined sensing mode. Somatosensory game is an interactive electronic game, which is mainly operated by body movements, and the operation is simple and convenient. It can simplify the complicated operation of the computer, which is conducive to tracking the body movement of children and improving the interaction between man and machine. In recent years, it is widely used clinically. In somatosensory games, children can enter and immerse themselves in the games without having to be constrained by traditional media such as keyboards and mice. A variety of fun games are not only conducive to the balance training of children with motor dysfunction and nerve damage, but also can make children with mental illness get a sense of pleasure, relieve negative emotions, and relax the body and mind.

In summary, the rehabilitation of somatosensory games in children with autism is beneficial to enhance their oral motor ability, enhance social function, and promote mental development, and has good clinical practical value.

References

[1] Wang Qian, Luo Yi, Li Jianan (2020). A Case of Cochlear Implantation in a Child with Autism [J]. Chinese Journal of Otology, vol. 18, no.4, pp. 678-680.

[2] Yao Taotao, Chen Zhuoming, Wang Min, et al (2020). Analysis of Cerebellar Magnetic Resonance Spectroscopy Characteristics of Children with Autism [J]. Chinese Journal of Physical Medicine and Rehabilitation, vol. 42, no.6, pp. 546-549.

[3] Shi Bijun, Cao Muqing, Jing Jin (2020). Research Progress on Repetitive Stereotyped Behaviors and Intervention in Children with Autism Spectrum Disorder [J]. Chinese Journal of Pediatrics, vol. 12, no.3, pp. 245-248.

[4] Chen Yixin, Zhou Yang, Gao Run, et al (2020). Analysis of Changes in Core Symptoms of Children with Autism Spectrum Disorder Who Have Improved Auditory Conduction Function through Auditory Integration Training [J]. Chinese Journal of Behavioral Medicine and Brain Science, vol.10, no.2, pp. 142-147.

[5] Gao Feng, Zhao Ningxia, Zhang Ningbo, et al (2019). The Clinical Efficacy of Shenzhen Acupuncture Combined with Special Education and Training in the Treatment of Speech Disorders in Children with Autism Spectrum Disorder [J]. Chinese Journal of Traditional Chinese Medicine, vol.34, no.12, pp.5987-5989.

[6] Zhou Wensu,Xu Huilan, Liu Dan, et al(2019). Association Study on Emotional Problems and Coping Styles of Mothers of Children with Autism [J]. Chinese Journal of Behavioral Medicine and Brain Science, vol. 23, no.11, pp. 1015-1019.

[7] Zhang Jishui, Wang Fang, Su Yi, et al (2019). Association Study of Methylenetetrahydrofolate Reductase Gene C677T Polymorphism, Birth Weight and Disease Risk in Children with Autism [J]. Chinese Behavioral Medicine and Brain Science Journal, vol. 42, no. 8, pp. 673-677.

[8] Liang Yamei, Miao Yingying, Zhao Jiajia, et al (2019). Clinical Observation of Scalp Acupuncture Combined with Language Training on Language Rehabilitation of Autistic Children [J]. Pediatrics of Chinese Medicine, vol.15, no.3, pp. 71-74.