

Efficiency of Relational Development Intervention Program for Children with Autism

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Abstract. Background: Relational Development Intervention (RDI) program is widely used for the treatment of children with autism. However, its effectiveness in different countries under local hospital conditions is various. This study assessed the efficiency of a modified RDI program that was adapted in Qiqihar Hospital in China. Methods: forty-two children with autism at the Mental Health Center of Qiqihar Medical University were divided into both a test group and a control group, according to the matching principals of their ages and IQ scores evaluated by ABC and C-WISC forms. General treatments of language and speech training, sensory integration training and group training were used in both groups. In addition, the RDI program that has been adapted to local conditions was applied to the test group. The autism treatment evaluation scale (ATEC) form was used to assess clinical syndromes after 3 and 6-month treatments. Results: At the end of 3 month of training, the total scores, language factor scores and the social factor scores, but not the sensory scores and behavior scores on ATEC in the test group were statistically lower than those in the control group ($p < 0.05$). At the end of 6 month training, all scores on ATEC in the test group were significantly lower than those in the control groups ($p < 0.05$), and all scores in the test group at the end of 6 month were also statistically lower than those at the end of 3 month ($p < 0.05$). Conclusion: The modified RDI improved the treatment of children with autism within 6 months at Qiqihar Hospital, China.

Keywords: autism spectrum disorders, relational development Intervention (RDI), autism treatment evaluation scale (ATEC).

1. Introduction

Autism spectrum disorder is a developmental disability affecting children worldwide [1]. The disease impaired each child in different ways across language use, social relationship, behavior, interests, verbal and non-verbal communication, and intelligence [2]. The incidence of this disease is different among different countries without apparent variations of their cultures and species [3]. The cause of autism are not clear, and there has no particular drugs for autism treatment [4]. The general treatment is to discover earlier, interfere earlier, and employ special training program to the young patients. However, the effectiveness of the treatment is varied [1, 5].

Relationship Development Intervention (RDI) has been widely employed in USA for the treatment of autism [6]. Individuals with autism can participate in authentic emotional relationships if they are exposed to these activities in a gradual, systematic way [3]. The goal of RDI treatment is to help children with autism to build up social relationship skills, encourage them to share thoughts and ideas with others, and develop independent thinking and problem solving abilities. During RDI treatment sessions, the parents and the certified therapists act as the chaperons who guide the children to participate in various activities. The children can be treated by using their skills learned from these activities in their daily life [5].

The effectiveness of RDI depends on its adaptation to some general treatment methods for children with autism [7]. For example, the language training with certified therapists to promote speaking ability, the collective training with more children and parents to enhance social ability and the sensory integration training to improve motion coordination ability. The nurses at Qiqihar Hospital in China have been rigorously trained for these general treatment methods for many years.

In this study, a RDI program was adapted to the general treatments for children with autism in a local hospital in China. All the programs are modified according to the local hospital conditions and

parents' routine lifestyle. The study results demonstrated the effectiveness of this new treatment for autism in children.

2. Subjects and Method

2.1 Subjects

The participating autism children were chosen from Mental Disorder Institute of the 2nd Affiliated Hospital of Qiqihar Medical University during the period of October 2013 to November 2014. The diagnosis was performed by two physicians who have had at least 5 years of experience in the field. All children with autism met the diagnostic criteria described in Diagnostic and Statistical Manual of Mental Disorders (DSM-5[®]) [8]. Autism children with Rett Syndrome, mental retardation, children and adolescents schizophrenia, special language development disorder, Selective Mutism, and obsessive compulsive disorder were all excluded from the study.

This study was approved by the Ethics committee of Qiqihar Medical University. All the children and their supervisors signed the Informed Consent Form before the tests.

2.2 Assessment Methods

1) ABC form The form was created by Krug in 1978, revised by Xiaoling Yang in 1989 [9], There are total 57 questionnaire items with a score of 0-158, including 5 factors such as Sense (S) with 9 items, Relationship (R) with 12 items, Body Motion (B) with 12 items, Language (L) with 13 items, and Behavior (V) with 11 items. The score was given as 4, 3, 2, and 1 according to the symptomatic status. All the scores were then summarized. The child is considered normal with a score of 31 or less, suspicious with a score of 31-52, and diagnosed as autism with a score of 52 or higher.

2) ATEC form Autism Treatment Evaluation Checklist, was created by American Autism Institute, and recognized internationally as the authorized checklist form for autism treatment evaluation [10]. The form consists of 4 factors, Language, Relationship, Sense, and Behavior with a score of 0-179. The higher the score, the severer the autism.

3) C-WISC Chinese Wechsler Intelligence Scale for Children. The form was revised by Yaoxian Gong [11].

All these three forms are widely accepted by Chinese hospitals as the effective methods to evaluate autism for treatment options.

2.3 Treatment Methods

1) RDI Relationship Development Intervention. RDI was developed by a US psychiatrist, Dr. Gustein [6]. The primary agents of change in RDI are parents, who begin their trainings by attending intensive workshops in the theory, principles, and components of RDI. In our adopted RDI program, various training activities were designed for individual autism children according to their different living environment. Parents were required to participate all the activities. Two 40-minute training sessions were conducted each week for sixteen weeks.

2) General language training The one-on-one trainings were conducted by certified language therapist. One autism child was trained by the same language therapist throughout the entire treatment period. The language training program consisted of pronunciation, words learning, language mimic, and picture talk. The training was 40 minutes for each session and two sessions were conducted per week.

3) Collective training One certified therapist trained all autisms children in the group. Each child was accompanied by his or her parent(s) or supervisor(s). The therapist conducted all collective activities including gaming, singing, dancing, and physical exercise. Each training session was 15-20 minutes long and two sessions were conducted per week.

4) Sensory integration training The certified therapists conducted the sensory integration training on children in both the control and test groups. The training consisted of sliding, floor skating, drumming, balancing, and touching. The training was twice a week of a 2-hour session.

2.4 Statistical Method

All data were statistically analyzed by using software SPSS13.0. A *t*-test was performed. The statistical variances were observed for children after 3 and 6 months treatment. $p < 0,05$ was considered statistical significant.

3. Results

All autism children enrolled in this study were evaluated by Autism Behavior Checklist (ABC) with an average score of more than 53. Total 42 children were included. Their ages were between 2 and 10 years old, and the average age was 70 ± 22.7 months. All children were divided into the control group (21 children) and the treatment group (21 children). The IQ scores of two groups were evaluated by C-WISC. In order to minimize the effects of various factors such as age and IQ, the difference of the average ages of two groups was limited to less than 6 months, and that of their IQ score was less than 1 standard deviation. The basic information of the control and treatment groups including ages and IQ scores was summarized in Table 1.

Table 1. Age and IQ score comparison

	Control group	Treatment group	<i>F</i>
Ages	70.63 ± 23.1	70.29 ± 22.3	0.04
IQ score	110.67 ± 10.00	112.38 ± 11.16	0.87

All the $p < 0.05$, no statistical variances of ages and IQ were observed for children in both groups.

3.1 Results after Three Months Treatment

In the initial study, the ATEC scores were collected from both the control group and the treatment group (Table 2). The RDI of treatment group demonstrated significant improvements on both language and relationship in ATEC diagnosis after an average 3 months of treatment, but not on sensory and behavior. The total scores also showed significant improvement in the RDI treatment group.

Table 2. The ATEC results after three months of treatment

	Language	Relationship	Sensory	Behavior	Total Scores
Treatment Group	16.00 ± 2.76	21.38 ± 3.47	22.71 ± 3.33	31.86 ± 4.20	91.91 ± 8.84
Control group	17.76 ± 2.72	25.62 ± 3.46	23.38 ± 3.54	33.10 ± 3.62	99.62 ± 9.49
<i>t</i>	-2.09	-3.97	-6.28	-1.02	-2.71
<i>p</i>	0.043	0.000	0.543	0.312	0.010

Note: $P < 0.05$ indicates statistical significance

3.2 Results after Six Months Treatment

In the follow up study, the ATEC scores were collected from both the control group and the treatment group after the 6-month treatment (Table 3). The RDI of the treatment group demonstrated significant improvements on language, relationship, sensory, and behavior. The total scores indicated dramatic performance improvements in the RDI treatment group.

Table 3. The ATEC results after six months of treatment

	Language	Relationship	Sensory	Behavior	Total score
Treatment group	12.10 ± 2.26	15.76 ± 3.14	17.48 ± 2.58	25.81 ± 3.89	71.14 ± 7.58
Control group	15.38 ± 2.54	20.71 ± 3.08	20.05 ± 3.32	29.90 ± 3.21	86.05 ± 8.15
<i>t</i>	-4.43	-5.15	-2.80	-3.72	-6.139
<i>p</i>	0.000	0.000	0.008	0.001	0.000

Note: $p < 0.05$ indicates statistical significance.

3.3 Results Summary

The treatment results of the control group and the treatment group with RDI after 3- and 6-month period were compared (Figure 1). RDI containing test group improved the aspects of language and relationship faster than those have the sensory and behavior. The dramatic improvements of sensory and behavior accelerated the total improvement of the treatment.

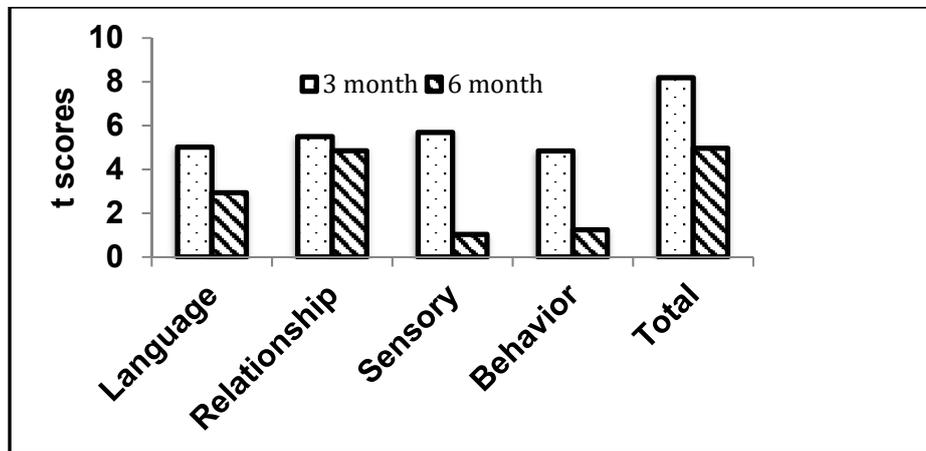


Figure 1. Results from the 3- and 6-month treatment on all aspects (language, relationship, sensory, behavior, and the total scores).

4. Discussion

In the previous treatment for children with autism at Qiqihar hospital, the general treatment methods including language training, collective training, and sensory integration training were employed. These methods alleviated some symptomatic features of children with autism; for example, the children’s language abilities were improved considerably. However, the total impact on children with autism was not significant. The children had to receive repetitive trainings for long period of time.

RDI program has been demonstrated as an effective way to treat children with autism. Matthew J demonstrated that RDI could enhance the social ability of autism children [12]. Bayat suggested that it was very important to establish good family relationships with children who were diagnosed with autism [13]. The RDI program was introduced to Qiqihar hospital for the treatment for autism children several years ago. The basic principals of RDI were followed by physicians at the hospital. Children who failed from the treatment with general methods were received RDI based treatment. The RDI program met some difficulties at Qiqihar hospital. The training programs indicated in the original RDI treatments were also difficult to be adapted under the local hospital conditions. For example, it was very hard for parents to participate the long and intensive programs, and the effectiveness of RDI treatment in Qiqihar hospital was not observed.

A modified RDI program was then created at Qiqihar hospital to overcome the aforementioned difficulties. The major changes included the following aspects. First, the RDI programs were more closed to the actual situation of each child’s daily life. The programs in our RDI trainings mimicked the actual situation of each child’s normal life so that he or she can easily recall what had been trained in the hospital. For example, the objects that the children used in their home were the exactly the same during the trainings in hospital. Second, a more flexible schedule was employed. Because most parents had to work every week, the RDI programs in our hospital were changed into a twice-weekly 40-minute session instead of the original intensive schedules. This adapted program made the parents feel more comfortable throughout all the training periods.

The modified RDI program combined with our general treatments for children with autism has been proven to be an effective way for children with autism [14]. The enrolled young patients were divided into the control group and the treatment group with no significant variations of ages and IQ scores. The effectiveness was evaluated by using ATEC scores. After the three-month treatment,

significant improvements were observed for language and relationship aspect, but not in sensory and behavior. However, after the 6-month treatment, significant improvements were observed in all aspects of the training program. Therefore, the efficiency of RDI program could be achieved within 6 months at Qiqihar hospital under the local conditions.

The modified RDI program combined with regular treatments can improve the children's sensory and behavior significantly [15]. During the period the treatment, the parents were also trained in RDI program. Parents gained more knowledge of autism. They grasped the specific methods of RDI combined program. Through the mimic programs to their family life, children participated more easily in the training, and this accelerated the recovery from autism symptoms.

Autism is a complicated mental disorder. The treatment of autism often requires multiple methods and long period of time [16, 17]. In this study, it was demonstrated that modified RDI combined with regular treatments might be an effective way to treat children with autism. The mimic programs close to the daily life of parents and their autism children were proven to be a practical method. Significant improvements could be achieved for autism children within a 3-6 month short period training program. Full coverage may be achieved with this method with longer time treatment. In conclusion, the RDI program was successfully adapted at Qiqihar hospital of China under local conditions. More studies of this modified RDI program will be conducted at Qiqihar hospital for further improvements of children with autism.

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