

## Developmental Progress of Autistic Children at a Daytreatment Center\*

주간치료소 자폐증아의 치료효과

Do-Un Jeong\*\* and Kang-E M. Hong\*\*\*

### INTRODUCTION

Since Leo Kanner(1943) first described "early infantile autism", it has been recognized to be a most distinct clinical syndrome in child psychiatry and many investigators as well as clinicians have been fascinated by these children. In the past two decades, a great deal of research has been done on this new puzzling syndrome and as a result of this endeavor there has been a major revision in the conceptual understanding of autism(Rutter, 1978; DSM-III, 1980; DeMyer et al., 1981).

However, in terms of treatment, various kinds of modalities were tried and described, such as psychotherapy, play therapy, pharmacotherapy, speech therapy, behavior modifications and special education. It is now clear that any single treatment method can't be specifically effective in helping autistic children. Instead, since infantile autism is conceptualized as being delayed in all areas of development, greater emphasis is put on a intensive, active, multimodal, psychoeducational approach in well structured, small group setting (DeMyer et al., 1981). That is

why a conventional special education facilities for mental retardation is not suitable for autistic children.

The establishment of daytreatment center for autistic children at Seoul National University Hospital was prompted by the community's compelling needs for the treatment of seriously disturbed children. When the first systematic child psychiatry service in Korea was begun in 1979 at this hospital, there was literally a "rush" of patients and analysis of first 600 child psychiatry outpatients revealed that one third of them were mentally retarded, neurologically impaired and pervasive developmentally disordered. Among them, pervasive developmentally disordered children including autism constituted 40% of preschool children visiting outpatient clinic and posed a particular problem because there were virtually neither educational nor treatment facilities to refer to. In Korea, it was only recent years that infantile autism and other pervasive developmental disorders were recognized clinically as separate entities from mental retardation and brain damage.

With the anticipation of that it would indeed represent the beginning of a hospital-based therapeutic nursery for the autistic children, this program accepted its first children on October, 1981. At the outset, the program was designed to provide an initial psycho-educational treatment to autistic children and refer them to the appropriate therapeutic nursery or kin-

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\*\* Department of Child and Adolescent Psychiatry, Seoul National Mental Hospital

\*\*\* Division of Child and Adolescent Psychiatry, Seoul National University Hospital

dergarten after their improvement.

In this paper, we will describe the program and the treatment results of the first 19 children enrolled in our program.

### PHYSICAL SET-UPS AND PROGRAM STRUCTURE

The center is housed in Seoul National University Hospital and it contains one office, one waiting room for parents and a large play and activity room. The physical setting is appropriate in size for the maximum of eight children. The room is well equipped with a variety of materials and toys suitable for these young children.

The primary therapists consist of two full time nurses, one part-time special educator, one part-time educator interested in art therapy, one volunteer speech therapist and two volunteer workers. All are female and they work as a team. They are supervised by the program director, a child psychiatry professor, and a child psychiatry fellow is assigned on a part-time basis, integrating multidisciplinary approach and running supportive parents group. Also two or three psychiatry residents are assigned three or four patients each and join the therapeutic team. Consequently, at a given time there are at least 3 to 4 therapists to interact with 6 to 8 children, making staff-to-child ratio 1 to 2. A weekly meeting is held for reviewing and reassessing

treatment goals and in-service training is done within the center. The primary therapists also join "the study group for autism", refreshing their practice and theory on the autistic children.

Pediatric, neurologic, speech therapy and other specialty consultations are always available and supposed to be one of advantages of this hospital-based dayprogram.

The children enter the program mainly through the outpatient clinic, where the children and the families are evaluated. The adopted criteria for the clinical diagnosis of autism is based on the one in DSM-III(1980). When a child is identified as suitable, he usually waits for some time to be enrolled because of the center's limited capacity. On entering the program, the children are evaluated according to the developmental profile and the therapists set initial goals for each child. The progresses are reassessed and readjusted at regular intervals.

The children are divided into two groups, the morning and the afternoon ones mainly by the individual child's developmental level rather than by his or her chronological age (Rutter, 1977) (table 1). Children are brought to the center 6 days a week for the two and a half hours' program. For the morning group, who manifests severe autistic features and profound disturbance in language development, the program is focused upon one-to-one affective interaction, in order to break autistic barrier and help them establish an attachment to others. To achieve these goals,

Table 1. Goals of the Program

	Goals	Focus
Morning group	breaking autistic barrier establishing attachment	one-to-one interaction individual play physical contact
Afternoon group	socialization more age-appropriate behaviors language	peer interaction group play combination with ordinary nursery or kindergarten

we don't insist on any particular therapeutic tool or method. Rather, intensive individual play and literally "skin to skin" interaction with them are provided. Once the attachment-like therapeutic relationship is somewhat established, simple educational tools may be utilized to promote the developmental progress. The morning session program is somewhat similar to the basic mothering, dealing with attachment behavior, eating, clothing, toilet training, behavior control and promoting motor functions, etc.

The afternoon group enrolls those who have shown substantial improvement in the morning program and require more peer socialization process. The program is oriented more toward structured educational tasks, and group play rather than individual one and various educational activities are encouraged. Progress in cognitive-intellectual capacity, social skills within the peer group, socio-dramatic play and more age-appropriate tasks are encouraged.

The program as a whole adopts the "developmental" framework as the basis for evaluation and treatment and utilizes the concepts of a

developmental hierarchy (Rutter, 1977; Hong and Greenberg, 1980).

## THE PROGRAM CONTENTS

The typical day's program is shown in table 2. The children arrive and go through routines of greeting, hanging up coats and going to the bathroom, etc. By these routine, self-help and social-emotional skills are promoted. It is followed by spontaneous free play for 30 minutes during which time therapists exchange individual interactions with the assigned children and periodically reassess them to readjust therapeutic goals and plans. Then, they are asked to join intensive individualized play for another 30 minutes; various kinds of programs for developing perceptual-motor skills are practiced and most of the children are encouraged to vocalize while they play. Gross motor activity is encouraged by climbing, rolling, jumping and sliding, and fine motor skills are taught by using crayons, pencils, cutting with scissors, stringing beads and so on. Visuo-motor coordination is promoted by ball

Table 2. Structure and Contents of Program

Time	Content	Focus
Greeting	greeting hanging up coats	social emotional self help
Free play	1/2hr.	
Individual play	1hr. bean stringing, building up blocks, puzzle, drawing, painting, cutting out with scissors, ... blowing bubbles, blowing candles, family doll play, learning about the body, "who are you?", coloring... rolling, sliding, climbing and jumping	fine motor language gross motor
Setting in order	1/2hr. setting toys in order washing hands one by one	self help self help
Snack	1/2hr. serving and eating together	socialization
Group play	1/2hr. moving and stopping with music, catching balls, "who runs faster?", ... peek-a-boo, hide and seek, playing doctor, going to the market...	gross motor social emotional
Good-bye	setting toys in order clothing, saying good bye	self help social emotional

**Table 3. Developmental Map**

	Gross Motor	Fine Motor	Language	Self-Help	Social-Emotional
3	lift head & chest hold head balanced roll over	clasp hand together reach toward objects pick up toy with one hand	vocalize, coo, chuckle vocalize spontaneously, social	comfortable with thumb or pacifier	social smile distinguish mother from others
6	sit alone steadily	transfer cube from hand to hand pick up objects with finger grasp	wide range of vocalizations listen to own vocalizations say mama, dada	feed self cracker	push unwanted things away stranger awareness
9	creep stand alone well	pick up small object-precise finger grasp	say mama, dada as names for parents understand "no," "stop," etc.	hold own bottle or drink from a cup	play social games such as peek-a-boo express several emotions clearly object to separation
12	walk with help				
18	pull to feet walk alone seat self	stack two or more blocks scribble dump pellet from bottle	say two words as names of things or actions point to two parts of body	cooperate in dressing feed self with a spoon	play simple ball games hug parent
24	run well kick ball forward	build tower of four or more blocks make imitative strokes-vertical, circular	use words to express wants use phrases understand simple directions	use spoon with moderate spilling use spoon, spilling little	imitate adult activities help with simple household tasks
24	throw ball forward	hold crayon with fingers	use pronouns for self and other talk in sentences	put on simple garment wash and dry hands	refer to self as I or me tell first & last name play with children show sympathy
36	go upstairs & downstairs alone stand on one foot	draw complete circle draw a cross, +	speech understandable 1/2 of time tell stories about daily experiences	toilet trained	
36	skip on one foot without support	draw a person that has at least three parts	know three colors understand prepositions counts four objects, answer "how many"	wash and dry hands and face comb or brush hair	know own sex tolerate separation from mother play cooperatively with others
48	skip on alternate feet good balance & coordina- tion	draw a person that has at least six parts draw square print a few letters	talk in sentences completely understandable define six familiar words	dress and undress without assistance, except for tying shoes	go on errands play role in "make believe" play follow simple game rules
60 (months)					

and beanbag throwing and catching. Visual and auditory discriminations are taught through presenting various shapes, sizes and colors and simple rhythms and various tones, respectively. In addition, we deal with tactile discrimination, body image and self concept, etc.

These are followed by 30 minutes' snack time, which is really a "social" hour, talking and serving. After this, the children experience one hour group play, in which gross motor and social emotional aspects are much dealt with. Frequent outings to a playground and a park are arranged and there are also special events such as picnics and parties which may involve the parents. The details of the program is modified flexibly according to the characteristics of the group as well as those of the individual child. Rather than sticking to the program mechanically, we respect the therapist's intuition and the child's curiosity and potentiality.

### DIAGNOSTIC EVALUATION

Once a child is enrolled in the program, the assigned psychiatrist and the primary therapist interview the family and evaluate the child. The evaluation tool (table 3) is based on the normal children's developmental map and divides the children's development into 5 categories such as gross motor, fine motor, language, self-help and social-emotional ones. Besides, autistic features are checked on a separate 14 items checklist (table 4). Evaluation of the children using the developmental map is done before, during and after treatment. This map was made out from Denver Developmental Screening Test and other sources on children's normal development such as Knoblock and Pasamanick's(1974). At present, there is no adequate standardized intellectual or developmental assessment tool for preschool children in Korea.

Table 4. Changes in Autistic Features

items \ cases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	Significance (Sign test, one sided)
eye contact	+	0	-	0	+	+	+	0	0	+	+	+	+	0	+	+	+	+	+	**
resistance			+		+	-	+		+	+		+	+	+	0		+	+		**
aggression			+	+	+	+	+	0	+	+		0		+	+	0	+	+	+	**
affect	+	+	+	+	+	0	+	+	+	+	+	+	+	+	+	+	0	+	+	*
hyperactivity		+	+	+	+		+			+		+	+	+	+					*
passivity	+			+	+		+	+	+		+			+	+					*
attachment with mother	+	+	+	+	+	+	+		0	+	+	0	+	+	+	+	+	+	+	*
echolalia			+	+	-	+	+		+	+	0	+	-			+				N. S.
peculiar vocalization	+	+				+	+					-	+	-	+			+		*
self harming							+	+				+	-	0	-	+		+		N. S.
over- or under-response	+	+		+	+	+	+		+		0				0	+		+		**
abnormal gait	+							+								0		+		N. S.
stereotypy & peculiar habits	+	+	-	+	+	+	0		+	+	+	+			0		0	0		*
deviated eating	+	+	+	+	+	+	+	+	+	+	0	+	+	+	+		+	+	+	*

+ : positive progress

- : negative progress

0 : no change or

no presence of such feature

\* p<0.05

\*\* p<0.01

N.S. : non-significant

Table 5. Subject Characteristics

Age/Sex (years)	Hosp. Days (months)	C.C.	Perinatal Cx.	Lab.	Marital Problem	Maternal Deprivation
1) 3 $\frac{4}{12}$ /M	9	language	herb medicine IVP, FD.	audio. EEG	+	-
2) 4 $\frac{11}{12}$ /M	6	language	antibiotics, VED	audio. EEG	-	-
3) 5 $\frac{9}{12}$ /M	16	language, stubborn		EEG	+	-
4) 5/M	11	language	CO difficult labor	EEG	-	-
5) 3 $\frac{1}{12}$ /M	14	language	IVP, C/S, incubator	EEG	-	+
6) 4 $\frac{9}{12}$ /M	8	language hyperactive interpersonal	trauma		+	-
7) 7 $\frac{8}{12}$ /M	15	language	medicine, FD		+	-
8) 10 $\frac{4}{12}$ /M	5	language	medicine		-	+
9) 4 $\frac{3}{12}$ /F	12	stubborn	medicine	CT	-	+
10) 5 $\frac{2}{12}$ /M	11	language hyperactive stubborn		EEG, CT	+	-
11) 4 $\frac{8}{12}$ /M	5	language hyperactive interpersonal	medicine, VED	audio. EEG	-	-
12) 7 $\frac{7}{12}$ /M	3	hyperactive	C/S		-	+
13) 4 $\frac{10}{12}$ /M	10	language hyperactive	antiemetics, VED	EEG, CT	-	-
14) 5/M	3	language	C/S	audio. EEG	-	-
15) 4 $\frac{7}{12}$ /M	5	language hyperactive	difficult labor	audio. EEG	-	-
16) 4 $\frac{10}{12}$ /M	8	language	PROM	*CT	-	-
17) 3 $\frac{1}{12}$ /M	7	language			+	-
18) 3 $\frac{4}{12}$ /M	13	language interpersonal		EEG	-	-
19) 3 $\frac{6}{12}$ /M	8	interpersonal	herb medicine	EEG	-	-

\* absence of corpus callosum  
C/S : Caesarean section  
FD : forcep delivery  
IVP : intravenous pitressin

audio. : audiometry  
PROM : premature rupture of membrane  
VED : vacuum extracted delivery  
CO : carbon monoxide poisoning

Since its opening, 19 children have been discharged from this program and referred to other agencies. By reviewing the cases and their clinical course, we try to assess the therapeutic effectiveness of this program for the autistic children.

All 19 children(table 5) were identified as infantile autism and other form of pervasive

developmental disorder. 18 were boys and only one was a girl and their age on entering the program ranged from 3 to 10 years with an average of 5. They stayed in the program from 3 to 16 months with an average of 9 months. The chief complaints were mostly delayed language development with some hyperkinetic behaviors and stubbornness including interpersonal

difficulties. Out of 19, 13 children revealed the history of prenatal or perinatal problems such as medication while pregnant, difficult labors resulting in Caesarean sections, vacuum extracted delivery, intravenous pitressin, forcep delivery and prematurity, traumas and carbon monoxide poisoning. Audiometry, EEG, and brain CT were done in 5, 12, and 3 cases, respectively and the results were all negative except in one child, whose brain CT revealed the absence of the corpus callosum. In 6 families, there was overt marital problem history and history suggesting maternal deprivation was found in 4 cases.

The children's biological ages were compared with the developmental ones in each 5 developmental areas and it was revealed that all of them were developmentally delayed at the point of admission in all 5 areas at the significant level ( $p < 0.01$ , paired T-test).

### TREATMENT OUTCOMES AND FOLLOW-UPS

Developmental progress in 14 children who stayed longer than 6 months in the program was analyzed based on the observations using the developmental map (Fig. 1). During the unit period of 6 months, the children showed an average developmental increase of 19 months in gross motor function, 19 months in fine motor, 17 months in language development, 17 months in self-help skills, and 20 months in social emotional development. The rest of the children who stayed less than 6 months showed much improvement, too. The indicated progresses were proven to be statistically significant ( $p < 0.01$ , paired T-test, one-sided).

The children were also evaluated on changes in autistic features and proved to be improving substantially in the degree of psychopathology. Among the 14 items, statistically significant

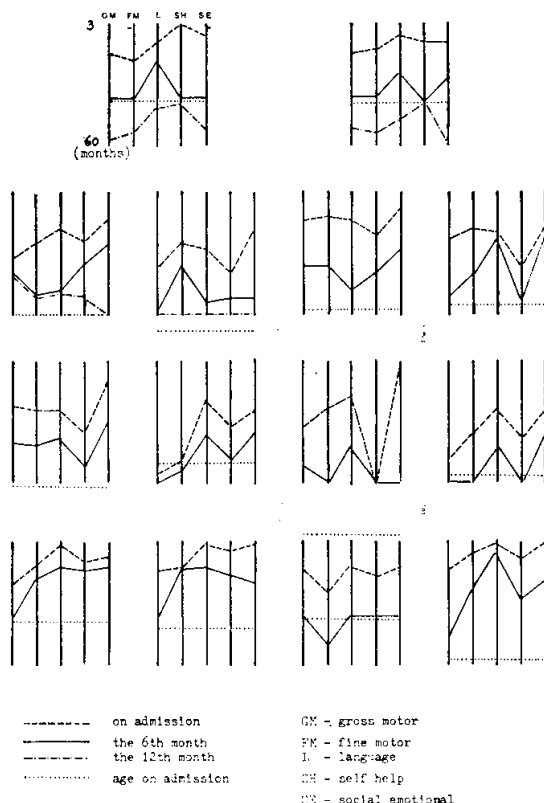


Fig. 1. Developmental Progress Shown on the Developmental Map

improvement occurred in 11 items (Sign test, one-sided) (table 4). Especially, it was consistently observed that as the child improved, they showed more appropriate aggression, self-defence behaviors and affective expressions not only in quantity but also in quality, making progress toward more age-appropriate behaviors.

Although the children showed measurable progress, no children at the 6th hospitalization month could reach his or her normal developmental level ( $p < 0.01$ , paired T-test).

After discharging from our program, out of 19 children, one child went to the public school, 2 went to the special classes in public school, 9 were referred to normal kindergartens, 6 to specialized education center also containing normal children, and one to special education school for the mentally retarded. No child was placed

in full time institutional care.

Among the 19 children, 13 were given a minor dose of haloperidol ranging from 0.25mg to 1.5 mg per day. Two of them were given 10mg of thioridazine or 100mg of phenytoin at the same time. Medications were not noted to cause acute disabling side effects in them.

## DISCUSSION

In evaluating the treatment outcomes, we found that the simple developmental map we used was quite easy to use even for a non-medical personnel and it also served as an efficient guiding tool in therapeutic activities. It could show children's progresses so vividly that the struggling therapists could see the results easily to feel rewarded. Therefore, we recommend the utilization of a detailed normal developmental chart as a effective tool for diagnostic evaluations and outcome measurement, especially in those countries like Korea, where the psychological assessment tools for the preschool children are not well developed.

As Shapiro (1978) claimed that any single treatment method alone is not quite effective in helping autistic children, we feel our multimodal developmental approach with major emphasis on interpersonal relationship building has proven its clinical effectiveness especially in the early phase of treatment for autistic children. It is our impression that autistic children with some hyperkinetic and other behavior problems could be helped a lot with a small dose of haloperidol (Faretta et al., 1970; Rutter, 1977; Cohen et al., 1980; Campbell et al., 1982), which helps the children become amenable to psychoeducational management.

Overall, we are very much encouraged by the outcomes of 19 children who were treated in our program. These pervasively disordered children showed marked developmental improvements in

all 5 developmental areas. Although one may argue with the validity of the evaluation tools and our study is not a strictly controlled one, we would like to maintain that this kind of treatment-educational program is definitely helpful to the children suffering from infantile autism and other pervasive developmental disorders (DeMyer et al., 1981). It is further supported by our clinical experiences with the other autistic children who are followed up at outpatient clinic without being enrolled in any psychoeducational facilities.

After two and a half years' experiences in running this type of program, we become increasingly persuaded that therapeutic effectiveness is greater if the children are enrolled in earlier age (Lovaas et al., 1974). Fortunately, autistic children are brought to our clinic very early lately even before the age of two. We plan to accept children under the age of 3 if possible and we feel we should expand our program to include the "infant program" in the future (Glasscote and Fishman, 1974).

On the basis of our experiences over the years, we believe that well trained nurses can be excellent therapists for autistic children. This would certainly be a good answer to the shortage of well trained special educators in this country and provide a rationale to expand this kind of hospital-based therapeutic nursery program.

It appears that one of the crucial factors influencing treatment outcome is the parents' attitude: how they perceive and whether they accept the children at their given level of development. So the parents group, mostly mothers are regularly met with the child psychiatrists and the psychiatry residents and they offer some educational and supportively psychotherapeutic atmosphere, thereby helping the parents become therapists themselves (Glasscote and Fishman, 1974; Lovaas et al., 1974).

Finally, the major problem that still remains



is what to do and where to send when these autistic children improve and get old. Our program is the initial therapeutic break-in and helps them establish human contact. After the initial progress made, more educational intervention are needed. However, currently, a very few autistic children are able to be included in public schools and majority of them still needs special education in some forms. And when we send the improved autistic children to ordinary kindergartens, there are a lot of definite resistances not only from parents but also from teachers. That is why our children stayed in the program longer than expected. Therefore, some measures to enhance the acceptance of improved autistic children to various educational system should be established, whether it is social or legal.

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＝국문초록＝

### 주간치료소 자폐증아의 치료효과

정도연\* · 홍강의\*\*

\*국립서울정신병원 소아정신과

\*\*서울대학교병원 소아정신과

1981년 10월 서울대학교병원 소아정신과에 발달장애 아 주간치료소가 개설된 이후 시행하고 있는 프로그램을 소개하고 그 곳에서 치료받고 퇴원한 19명의 자폐 아들의 치료경과를 조사하였다.

1. 19명중 남아가 18명, 여아가 1명으로서 자폐아의 성별 분포에 합치하는 소견을 보였다.

입원당시 연령은 3세에서 10세 사이로 평균 5세였으며 입원기간은 3개월에서 16개월로 평균 9개월이었다. 입원당시 주소는 대개 언어발달의 장애였으며 13명에서 과거력상 임신중이나 분만중의 의학적인 문제들을 발견할 수 있었다.

2. 치료는 대상아동의 발달수준에 따라 오전반 및

오후반으로 나누어 시행하였으며 오전반에서는 자폐적인 대인관계를 개선하기 위한 개별적인 접촉에 중점을 두었고 오후반에서는 집단생활에 주력하였다.

3. 입원당시 발달수준은 정상아들의 발달이정표와 비교시 유의하게 떨어져 있었고 6개월간의 치료후 비교한 결과도 정상수준에는 미치지 못하고 있었으나 단 위기기간인 6개월간 대운동, 소운동, 언어, 자조능력, 사회성에서 각각 19개월, 19개월, 17개월, 17개월, 20개월의 향상을 보였으며 통계적으로 유의함을 증명할 수 있었다.

또한 14개의 자폐증상에 대한 변화를 검토한 결과 11개 문항에서 통계적으로 유의한 호전을 보였음을 알 수 있었다.

4. 13명에서 소량의 haloperidol을 투여하여 보조적인 치료효과를 보았다.

결론적으로 자폐아의 치료는 하나의 치료방법에 정착하기 보다는 다각적 접근방법(multimodal approach)을 소규모 집단에서 주간치료 형태로 시행하는 것이 효과적임을 알 수 있었다.

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