

A Follow-Up Study of 201 Children with Autism in Kyushu and Yamaguchi Areas, Japan¹

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A follow-up survey was conducted on 201 young adults with autism who were 18 or older (mean age, 21.5). All had participated previously in intensive therapeutic camping or had therapeutic involvement at medical consultation agencies to evaluate their outcome. Their social outcome was better than that previously reported in Japan. Although 31.5% had shown marked deterioration during adolescence, 43.2% had shown marked improvement during that period. Possible factors contributing to these results are discussed.

INTRODUCTION

Since Kanner's (1943) first report, there have been many follow-up studies of children with autism or similar conditions (Creak, 1963; DeMyer et al., 1973; Eisenberg, 1956; Gillberg & Steffenburg, 1987; Kanner, 1971;

¹This paper was presented in the 12th Conference of the International Association of Child and Adolescent Psychiatry and Allied Professions in Kyoto, Japan, July 19, 1990. This research was supported by Grant-in-Aid for Scientific Research for Autism from the Ministry of Welfare of Fukuoka Prefecture in Japan and by Research-Aid from Western Welfare Foundation of Asahi Newspaper Industry.

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Lotter, 1974a; Mittler, Gilles, & Jukes, 1966; Rutter, Greenfeld, & Lockyer, 1967). Most reports have indicated that the majority of autistic children have a very poor outcome. Although these earlier researchers were mostly done in European and American countries, in recent years studies in Asian countries have also been reported (Chung, Luk, & Lee, 1990; Soong, 1986).

In Japan autism was first dealt with in the field of child psychiatry about 40 years ago (Sumi, 1952), and autistic children were first educated in specialized units about 20 years ago. Most of the autistic children who had therapeutic involvement in their early childhood have now reached adolescence or adulthood, and serious attention must now be paid to the method of their treatment from the therapeutic, educational, and welfare standpoint.

Several cases of the outcome of autism have been reported in Japan (Ishii, 1978; Kobayashi, 1985; Shirataki et al., 1984; Tamai, 1979; Wakabayashi, 1980; Wakabayashi & Mizuno, 1975; Wakabayashi & Sugiyama, 1986). However, most of these reports have proven to be pessimistic or negative, which has created a general impression that in Japan, too, most of the patients with autism can expect poor outcome.

Over the past 20 years, in addition to our specialized clinics, we have organized group therapy for autistic children by volunteer activities every Saturday (Murata et al., 1975), and have conducted 4-day intensive therapeutic camps for autistic children residing in the Kyushu and Yamaguchi areas every summer (Kobayashi & Murata, 1977). Through these activities we attempted to go beyond the narrow medical framework and dealt with therapeutic education in a wider context of social education within the community. We have made steady progress not only in working with autistic children therapeutically but by giving nurturance guidance to their families and training the professional staff.

We conducted a follow-up survey of the outcome of children with autism born before April 1972 and now 18 years or older, who had participated in our therapeutic camp or had (or still have) therapeutic involvement at medical consultation agencies. We wished to evaluate the results of our 20 years of effort, and compare these with previous reports in Japan.

METHOD

Subjects

The subjects were autistic children with whom we had had a therapeutic relationship in their early childhood or school age at medical, educational, or welfare places, or during the therapeutic camps. They all had

three main symptoms: (a) impairment in reciprocal social interaction, (b) impairment in verbal and nonverbal communication, and (c) repetitive activities or obsessive preoccupation with a particular object. Most of the children had their onset at the age of less than 36 months, but eight had onset at more than 36 months. In accordance with the present diagnostic criteria, all would have fallen under the autistic disorders of DSM-III-R (American Psychiatric Association, 1987).

We selected 231 patients who satisfied these conditions. Among them, located an available for information about their present conditions were 201 (87%), which included 4 who had died (Table I). The boy: girl ratio was 170:31 (5.5:1). Of all the subjects 165 (82.1%) had participated in our intensive therapeutic camping. One hundred thirty-five (67.2%) of these were referred to our specialized clinics and diagnosed as autistic children. We had or have had therapeutic relationship with them since our first contact.

The age distribution at follow-up of the 197 surviving young adults (Table II) was 67 below 20 years, and 130 cases 20 years or older. The oldest was 33. The mean age was 21.8 years ($SD = 3.6$).

Age at Initial Contact and Duration of Follow-Up

The age distribution at initial contact of all the subjects was shown in Table III. About two thirds (135 cases, 67.2%) had initial contact with us before or just when they entered primary school. The mean age was 6.4 ($SD = 2.8$) years. Durations of follow-up of the subjects excluding 4 who

Table I. Number of Subjects

Sex	Alive ($n = 197$)	Dead ($n = 4$)	Total ($N = 201$)	%
Male	166	4	170	84.6
Female	31	0	31	15.4

Table II. Age Distribution of Living Subjects at Follow-Up

	18-19	20-21	22-23	24-25	26-27	28-29	30-31	32-33	Total
Male	59	43	24	24	10	2	3	1	166
Female	8	7	6	5	1	2	0	2	31
Total	67	50	30	29	11	4	3	3	197

Table III. Age Distribution of Subjects at Initial Contact

Age (years)	Male	Female	Total	%
0-3	32	6	38	18.9
4-6	79	17	96	47.8
7-9	36	6	42	20.9
10-12	17	2	19	9.5
≥13	6	0	6	3.0

Table IV. Intellectual Level at Age 6 Years^a

Intellectual level ^b	IQ	Male (n = 170)		Female (n = 31)		Total (N = 201)	
		n	%	n	%	n	%
Normal	≥80	30	17.9	5	16.1	35	17.6
Borderline	70-79	9	5.4	3	9.7	12	6.0
Mild MR	50-69	42	25.0	13	41.9	55	27.6
Moderate MR	35-49	58	34.5	8	25.8	66	33.2
Severe MR	≤34	29	17.3	2	6.5	31	15.6
Unknown		2				2	

^aU test, ns^bMR indicates mental retardation.

had died were from 5 to 28 years. The mean duration was 15.4 ($SD = 4.5$) years.

Intellectual Level at 6 Years

The intellectual level of the children had been evaluated in most cases by intelligence tests such as Tanaka-Binet, Suzuki-Binet, or WISC. Some children had been evaluated by intensive observation in the therapeutic camping for 4 days. Table IV indicates that about a quarter of the children were not mentally retarded (normal 35 cases, 17.6%; borderline 12, 6.0%); 55 children (27.6%) were mildly mentally retarded. Sex difference of the total IQ proportion was not significant (U test, $Z = 1.609$, ns), but when the group was split into two by IQ 50 more or less, the IQ of females was significantly higher than that of males, $\chi^2(1) = 3.994$, $p < .05$.

Level of Speech Development at 6 Years

Levels of speech development at 6 years were defined as follows: very good = can speak naturally with a rich vocabulary; good = can speak but

unnaturally and sometimes inappropriately; fair = can speak but with echolalia; poor = vocalizes only with echolalic speech; very poor = does not vocalize any meaningful word. The results were very good 1.5%, good 18.1%, fair 31.2%, poor 24.6%, and very poor 24.6% (Table V). About half of the children had no communicative speech. Females were more able to speak than males (U test, $Z = 2.341$, $p < .05$).

School Education

In Japan, children start school at the age of 6 years. From 6 to 12 years, they go to primary school, and then to lower secondary school till age 15 years. These periods of schooling are compulsory. Children had little chance to get special education until a system for educating autistic children had been developed in the 1970s.

About 80% of the children surveyed were educated in ordinary class or special class in primary school, but this percentage decreased in lower secondary school (Table VI).

Procedure

We sent questionnaires to the families to confirm the location of the patients and asked them the present status of the patients. In their present status assessment, we made the final conclusions after (a) interviewing the patients or their parents directly (95 cases), (b) interviewing over the phone (97), or (c) referring to the opinions of the staff with whom the patients were currently engaged in the medical, educational, or welfare field (9).

Table V. Level of Speech Development at Age 6 Years^a

Level of speech development	Male (<i>n</i> = 170)		Female (<i>n</i> = 31)		Total (<i>N</i> = 201)	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Very good	2	1.2	1	3.2	3	1.5
Good	27	16.1	9	29.0	36	18.1
Fair	51	31.0	11	32.3	62	31.2
Poor	41	24.4	8	25.8	49	24.6
Very poor	46	27.4	3	9.7	49	24.6
Unknown	2				2	

^a U test, $p < .05$.

Table VI. School Education (Compulsory Education)

School education	At age 6 years (<i>N</i> = 201)		At age 12 years (<i>N</i> = 200)	
	<i>n</i>	%	<i>n</i>	%
Ordinary class	76	39.2	52	26.8
Special class for MR	77	39.7	61	31.4
School for MR	27	13.9	71	36.6
Others	14	7.2	10	5.2
Unknown	7		6	

Definitions

Present Language Developmental Level (PLDL). Very good = can communicate freely with a rich vocabulary; Good = can communicate, but unnaturally and sometimes inappropriately; Fair = can understand others in daily life, but cannot communicate verbally; Poor = vocalizes echolalic speech mostly in single words; Very poor = vocalizes "words" of no meaning, or does not talk.

Present Adaptive Level (PAL). This is taken to mean their overall outcome. Very good = employed (or goes to school) and adapts satisfactorily, his/her ability to work is highly estimated; Good = employed (or goes to school), lives a normal life almost independently; Fair = behaves a little inappropriately but lives a daily life at home, or not employed but lives a daily life with a little aid; Poor = behaves very oddly, cannot adapt socially and needs some aid; Very poor = has poor social skills, cannot adapt socially, always needs much aid.

RESULTS

Social Outcome

Their social outcome, shown in Table VII, is as follows: 41 subjects employed with pay and 2 working for their family business and regarded as employed. These 43 people are considered to be actually employed which makes 21.8% of 197 cases excluding the 4 dead subjects. Six were university or junior college students and 5 were special technical school students. We were able to determine that most of these 11 students had sufficient adaptability and good chances of obtaining employment. These 54 (27.4%) were determined to be almost socially independent or have good chances for social independence.

Table VII. Social Outcome

Social outcome	Male	Female	Total (N = 197)	
	(n = 170 ¹⁶⁶)	(n = 31)	n	%
Employed	35	6	41	20.8
Helps with family business	2	0	2	1.0
University	5	0	5	2.5
Junior college	0	1	1	0.5
Special technical school	5	0	5	2.5
Special care unit for mentally handicapped	35	8	43	21.8
Special unit for autistic people	27	5	32	16.2
Sheltered workshop	24	3	27	13.7
At home	13	5	18	9.1
Psychiatric daycare center or public/private workshop	14	3	17	8.6
Psychiatric hospitalization	4	0	4	2.0
School for mentally handicapped	2	0	2	1.0

Forty-three subjects were in special care units for the mentally handicapped; 32 were in special units for autistic people; 27 were in sheltered workshops; 18 were at home. Their clinical manifestations were very varied: The worst case was much deteriorated, suffering from frequent epileptic seizures. Some had no chance of getting jobs in spite of their good adaptive level. Seventeen were in psychiatric day care centers mainly for adult schizophrenic patients, or in public or private workshops. Four were in psychiatric hospitals. Two were still in schools for the mentally handicapped.

Job Descriptions of the Employed

The jobs of those employed ($n = 43$) are shown in detail in Table VIII. Several realized their childhood dreams such as to become a bus conductor, an auto mechanic, or a cook. Many were industrial workers. Very few were employed in the service industry. Monthly income ranged from 30,000 to 40,000 yen to more than 150,000 yen. Most of these subjects were living with their parents and none were married.

Those Who Quit Work

There were 8 patients who had quit work. The reasons were trouble with fellow employees (2 cases), not accepted although he felt he had done his best (1), financial crisis within the company (2), lost enthusiasm for the

Table VIII. Job Descriptions of the Employed (*n* = 43)

No.	Sex	Age	At 6 years		School education ^c			PLDI ^d	PAL ^e	Employment	Income/ month/ (Yen ^f)	Residence
			IQ ^a	Speech ^b	7-12	13-15						
1	M	27	Normal	VG	OC	OC	OC	VG	VG	Bus conductor	II	With parents
2	M	26	Mild	P	OC->SC	SC	SC	G	G	Laundry	III	With parents
3	M	25	Normal	G	SC	SC	SC	VG	VG	Assistant plasterer	III	With parents
4	M	25	Normal	G	SC->OC	SMH	SMH	G	F	Chikuwa maker	IV	With parent
5	M	24	Mild	F	OC	OC	OC	G	VG	Paper maker	II	With parents
6	M	24	Moderate	P	SC	SC	SC	G	VG	Laundry	II	With parents
7	M	23	Normal	G	OC	OC	OC	G	G	Okazu (side-dishes) maker	IV	With parents
8	M	23	Borderline	G	SMH	SMH	SMH	G	G	Tatami maker	IV	With parents
9	F	23	Normal	VG	OC	OC	OC	VG	G	Civil servant	II	With parents
10	M	23	Normal	F	OC	OC	OC	G	G	Auto mechanic	II	Apartment
11	M	23	Moderate	F	OC	OC	SC	G	F	Helper (pawshop) ^h	—	With parents
12	M	23	Severe	VP	OC->SC	OC	SMH	F	G	Helper (laundry) ^h	—	With parents
13	M	22	Normal	G	OC	OC	OC	G	VG	Industrial worker	II	With parents
14	M	22	Moderate	VP	SMH->SC	SMH	SMH	VG	G	Tatami maker	IV	With parents
15	F	22	Normal	G	OC	OC	OC	VG	VG	Physical therapist	I	Apartment
16	M	21	Normal	F	OC	OC	OC	G	F	Fried Satsuma maker	III	Group home
17	M	21	Normal	F	OC	OC	OC	VG	VG	Printer	II	With parents
18	M	21	Mild	F	OC->SC	SC	SC	G	G	Laundry	III	With parents
19	M	21	Borderline	G	OC->SC	SC	SC	G	G	Frozen food maker	III	With parents
20	M	21	Normal	G	OC	OC	OC	G	G	Ironmongery industry	IV	With parents
21	M	21	Normal	G	OC	OC	OC	VG	VG	Industrial worker	II	With parents
22	M	21	Moderate	P	OC->SC	SMH	SMH	G	G	Trash collector (park)	IV	With parents
23	M	21	Moderate	VP	Unknown	SMH	SMH	F	VG	Laundry	II	With parents
24	M	20	Mild	F	OC	OC	OC	G	G	Aluminium ware industry	II	With parents

25	M	20	Moderate	P	SC	SC->SMH	F	G	Tile roofer	III	With parents
26	F	20	Borderline	G	OC	OC	F	VG	Office worker	II	With parents
27	M	20	Mild	F	OC	OC	VG	VG	Industrial worker	II	With parents
28	F	20	Moderate	VP	SC	SC	F	VG	Confectionery maker	III	With parents
29	M	20	Mild	F	OC	OC	G	G	Electric machine industry	III	With parents
30	M	20	Moderate	P	SC	SMH	F	G	Rental oshibori industry	III	With parents
31	M	20	Normal	G	OC	OC	G	VG	Electronic parts maker	III	With parents
32	M	19	Borderline	F	OC	OC	VG	G	Industrial worker	II	With parents
33	M	19	Mild	F	OC	OC	G	G	Office worker	II	With parents
34	M	19	Mild	F	OC	OC	VG	VG	Cook	III	With parent
35	M	19	Mild	F	OC	OC	G	G	Okazu (side-dishes) maker	III	With parents
36	F	19	Mild	F	OC	OC	G	G	Processed marine products	III	With parents
37	M	19	Mild	F	OC	OC	VG	VG	Trash collector	I	With parents
38	M	19	Mild	F	OC->SC	SC	G	G	Shopping bag maker	III	With parents
39	F	19	Mild	P	SC	SC	G	VG	Daily dishes maker	III	With parent
40	M	19	Mild	F	SC	SC	F	G	Bakery	III	With parents
41	M	18	Mild	G	OC->SC	SC->SMH	F	G	Construction worker	III	With parents
42	M	18	Moderate	F	SMH->SC	SC	VG	VG	Dressmaker	III	With parents
43	M	18	Moderate	P	OC	OC	G	G	Pickle maker	III	With parents

^aIQ: Normal = ≥ 80 , Borderline = 70-79, Mild = 50-69, Moderate = 35-49, Severe = 0-34.

^bSpeech: VG = Very good, G = Good, F = Fair, P = Poor, VP = Very poor.

^cSchool education (compulsory education): 7-12 = elementary school (dep), 13-15 = lower secondary school (dep), OC = ordinary class, SC = special class, SMH = school for mentally handicapped.

^dPLDL (Present Language Development Level): VG = Very good, G = Good, F = Fair, P = Poor, VP = Very poor.

^ePAL (Present Adaptive Level): VG = Very good, G = Good, F = Fair, P = Poor, VP = Very poor.

^fIncome/month: I = $\geq 150,000$, II = 100,000-150,000, III = 50,000-100,000, IV = $< 50,000$.

^g\$1 U.S. \approx 160 yen in 1990.

^hHelper = One who helps at his father's business with no pay.

job (1), admitted to a specialized unit for autistic people (1), too exhausted to work (1), left work after the death of a parent (1).

Cases of Death

A total of 4 patients, all male, died. The causes were suspected encephalopathy in sudden death at 6 years, head injury resulting from self-injurious behavior at 16 years, nephrotic syndrome at 20 years, and bronchial asthma at 22 years. The third patient had been employed as a painter until he died.

Present Language Developmental Level (PLDL)

PLDL was evaluated and classified into the five levels shown in Definitions. The results are very good 16.2%, good 30.5%, fair 32.0%, poor 9.1%, and very poor 12.2% (Table IX). Of all the subjects 46.7% can communicate verbally more or less. Females were superior to males in their ability to speak (U test, $Z = 2.364$, $p < .05$).

Present Adaptive Level (PAL)

PAL was evaluated and classified into the five levels shown in Definitions. The results are very good 10.7%, good 16.2%, fair 26.9%, poor 22.8%, and very poor 23.4% (Table IX). Sex difference was not significant (U test, $Z = 0.576$, ns).

Table IX. Present Language Developmental Level (PLDL) and Present Adaptive Level (PAL)

PLDL and PAL	PLDL ^a		PAL ^b	
	Male/female (166:31)	Total (N = 197) n %	Male/female (166:31)	Total (N = 197) n %
Very good	23:9	32 16.2	17:4	21 10.7
Good	49:11	60 30.5	27:5	32 16.2
Fair	56:7	63 32.0	45:8	53 26.9
Poor	16:2	18 9.1	36:9	45 22.8
Very poor	22:2	24 12.2	41:5	46 23.4

^aU test, $p < .05$.

^bU test, ns.

Epileptic Seizures

Table X shows that 36 out of 188 patients (19.1%) suffered from epilepsy. The age of onset was from 1 to 23 years. The age distribution was much wider than previously reported (Deykin & MacMahon, 1979). The mean age of onset was 13.3 years. There was no sex difference in the frequency of suffering from epilepsy. They all were taking anticonvulsant drugs. Most of the epileptic seizures were controllable but three cases are still uncontrollable. All except one patient had generalized seizure.

Ages When Marked Improvements Occurred

We asked their families if there was any particular time that marked an improvement in their children and the immediate cause if the answer was yes. Of 169 cases, 73 (43.2%) answered yes; 28 cases were unknown. A change was indicated not only by improvement of symptoms but also by a decrease in dependency.

The distribution of ages when marked improvement occurred (Table XI) showed that it happened mainly between 10 and 15 years.

Ages Marked Deterioration Occurred

We also studied whether or not there was any particular age when a sudden change for the worse occurred and, if so, what caused such a

Table X. Age at Onset of Epileptic Seizures

	<i>n</i>	0-3	3-6	7-10	11-14	15-18	19-22	≥ 23	Total	Frequency, %
Male	157	2	3	3	8	8	4	2	30	19.1
Female	31	0	1	1	1	1	2	0	6	19.4
Total ^a	188	2	4	4	9	8	6	2	36	19.1

^a Unknown cases, *n* = 9.

Table XI. Age When Marked Improvements Occurred

	<i>n</i>	0-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	≥20	Total	%
Male	141	3	5	8	13	13	10	5	3	2	62	44.0
Female	28	0	2	0	4	2	0	0	1	2	11	39.3
Total ^a	169	3	7	8	17	15	10	5	4	4	73	43.2

^aUnknown cases, *n* = 28.

change. Changes for the worse were noted in 47 of 149 cases (31.5%); 48 cases were unknown.

The symptoms of changes for the worse were, for example, hyperactivity, regression, aggressiveness, destructiveness (often against self, sometimes against others), and increased obsessiveness or repetitive behaviors (Gillberg & Steffenburg, 1987). The age distribution when such changes occurred (Table XII) showed that the number increased drastically from the age of 10, and even after 20 the tendency to worsen continued.

Prognostic Factors

The speech level at 6 years (when they began primary school) was significantly correlated to PAL in the case of males (Spearman's rank correlation, $r = .485$, $p < .0001$) but not in females (Spearman's rank correlation, $r = .187$, ns) (Table XIII).

The IQ at 6 years was also significantly correlated to PAL not only in males (Spearman's rank correlation, $r = .507$, $p < .0001$) but also in females (Spearman's rank correlation, $r = .390$, $p < .05$) (Table XIV).

Table XII. Age When Marked Deterioration Occurred

	<i>n</i>	0-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	≥20	Total	%
Male	126	1	1	1	5	9	6	6	6	5	40	31.7
Female	23	1	0	0	0	2	1	2	0	1	7	30.4
Total ^a	149	2	1	1	5	11	7	8	6	6	47	31.5

^aUnknown cases, $n = 48$.

Table XIII. Correlation between Speech Level at Age 6 Years and PAL ($N = 195$)^a

Speech level at 6 years	PAL				
	Very good	Good	Fair	Poor	Very poor
Very good	1/0	0/1	0/0	1/0	0/0
Good	6/1	9/2	4/2	6/4	1/0
Fair	8/1	10/2	18/3	10/2	4/2
Poor	1/1	6/0	12/2	10/3	11/2
Very poor	1/1	2/0	10/1	9/0	24/1

^aFigures shown are number of males/number of females. Spearman's rank correlation for males, $p < .0001$; for females, ns; for males + females, $p < .0001$.

Table XIV. Correlation between IQ at Age 6 Years and PAL ($N = 195$)^a

IQ at 6 years	PAL				
	Very good	Good	Fair	Poor	Very poor
Normal	7/1	8/1	9/2	4/1	1/0
Borderline	1/0	3/1	2/1	3/1	0/0
Mild MR	6/2	9/3	11/3	10/4	4/1
Moderate MR	3/1	6/0	17/1	15/3	16/3
Severe MR	0/0	1/0	5/1	4/0	19/1

^aFigures are number of males/number of females. Spearman's rank correlation for males, $p < .0001$; for females, $p < .05$; for males + females, $p < .0001$.

DISCUSSION

The present study was not done on the basis of a population-based series of autistic children (Gillberg & Steffenburg, 1987; Lotter, 1974a), nor on the basis only of children referred to specialized clinics (DeMyer et al., 1973; Rutter et al., 1967). Most of the children in our study participated in our intensive therapeutic camping (Kobayashi & Murata, 1977) and about two thirds of them were referred to our specialized clinics. They resided over a wide area in the west of Japan, in Kyushu and Yamaguchi areas, containing some 12% of the total population of the country. They were followed up to the ages of 18–33 years.

In comparing the IQ distributions of our subjects with those studied by Rutter and Lockyer (1967), we discovered a rather remarkable similarity. In their sample, the proportion of severely retarded children ($IQ < 50$) was 42.9% while the proportion of mildly retarded ($IQ = 50-70$) was 28.6%; 28.5% had IQs > 70 . In our samples, the figures were 48.8, 27.6, and 23.6%, respectively. This confirms the previous finding that about three of every four autistic children show mental retardation in addition to autism (Frith, 1989). The similar results of these studies shows that the IQ distributions of our samples might not be distorted by referral bias.

Many follow-up studies of children with autism or similar conditions have been reported in European and American countries (Creak, 1963; Eisenberg, 1956; Gillberg & Steffenburg, 1987; Kanner, 1971; Lotter, 1974a; Mittler et al., 1966; Rutter et al., 1967), most of which have indicated that 60–70% of autistic children have a poor or very poor outcome. Some reports in Asian countries show similar results (Chung et al., 1990; Soong, 1986). Direct comparison of our research with other countries is not possible because of cross-cultural differences such as educational systems and community background.

In Japan many reports (Ishii, 1978; Shirataki et al., 1984; Tamai, 1979; Wakabayashi, 1980; Wakabayashi & Mizuno, 1975; Wakabayashi & Sugiyama, 1986) excluding one (Kobayashi, 1985) have claimed that 60–70% of the autistic patients can also expect poor outcome. But the social outcome of the 201 cases we examined gave better results compared with what had been reported previously in Japan. What are the factors contributing to these good results? There are several possible reasons, although it is impossible to compare this and the earlier studies exactly.

First, the children in some past reports in Japan (Wakabayashi & Mizuno, 1975) had little chance to receive specialized education for autistic children. Such cases are called “Autism in the First Generation” (Wakabayashi & Sugiyama, 1986). In contrast, most of our samples, who may be called “Autism in the Second Generation,” were able to be more educated in a specialized setting in their childhood.

Second, the subjects were taken from not only those patients who underwent medical therapy but also those who attended therapeutic camps that were held in order to address and involve the community.

Third, we were able to locate an extremely high proportion of subjects (86%), especially for children of high-functional autism (DeMyer et al., 1973) who are usually difficult to trace.

Fourth, the Japanese economy has remained buoyant in recent years and the demand for labor has remained high. Many more autistic children were found to be employed in our samples than those of other studies (DeMyer et al., 1973; Rutter & Lockyer, 1967; Wakabayashi & Mizuno, 1975). These results are a reflection of current economic conditions, which provide the subjects with fairly good opportunities for getting a job. However, their employment may be relatively insecure, for if the economy slackened, they would be in danger of being dismissed.

Fifth, most of the subjects in the Kyushu and Yamaguchi regions lived within the same area as in their early childhood. Therefore it was rather easy to maintain a consistent therapeutic and educational relationship with them.

Last, in the Kyushu region there is an association of parents of autistic children, the only organization of its kind in Japan, which was set up 16 years ago. Through this association, which supports the families and promotes links between them, parents have developed a strong feeling of solidarity.

It was also found that higher IQ was a good predictor of outcomes in our sample both in male and female (Chung et al., 1990; Lotter, 1974b; Rutter et al., 1967). Higher developmental level of speech at the age of 6 years was not necessarily a good predictor, especially in females. This indicates that autistic females tend to be more seriously affected than boys

in spite of their higher developmental level of speech (Maccoby & Jacklin, 1980; Wing, 1981). Research by Tsai, Stewart and August (1981) and Lord, Schopler and Revick (1982) shows the same results.

It has been excessively emphasized that the state of children with autism tends to become aggravated in their adolescence (Gillberg, 1989; Gillberg & Schaumann, 1981). Our study also indicates that many children (31.5%) showed deterioration in adolescence. In some cases these changes started just before an onset of epilepsy (Gillberg & Steffenburg, 1987). However in most cases, social factors such as teacher's attitude toward them and cruelty of their schoolmates were the prevailing causes. In addition to this, there were also many more (43.2%) who showed remarkable improvement. This improvement happened mainly between 10 and 15 years of age, and was caused by significant events in their lives, such as taking up dormitory living or separation from the mother due to her illness or death. They might tolerate the separation best, however, this implies that the problems concerning the mother-child separation and the child's achievement of independence, associated with preadolescence or early adolescence, have strong effects on autistic children as well (Kobayashi, 1990; Kobayashi & Murata, 1989).

The peak period for onset of seizures, marked improvements, and marked deteriorations all occurred approximately between 11 and 17 years of age. The stages of brain growth seem to occur in association with significant mental developments that involve important advances in both cognitive and emotional functions (Ornitz, 1991). This suggests the possibility of some neurophysiological, perhaps neuroendocrine-related, plasticity allowing for change, for the worse or the better. Therefore, how well they can manage and overcome their adolescent period, determines whether or not they grow to be independent in the future. Adolescence does not always stand for something negative. It was clearly indicated that adolescence offers a vital opportunity for promotion of their independence. Prominence of this tendency in adolescence, especially in early adolescence, suggests that it is important to support them so that the proper development will be facilitated during this period.

We emphasize the importance of the psychoeducational approach for the parents of autistic children who are in preadolescence to early adolescence (Kobayashi & Shinbo, 1990; Pelling, 1989). It is during this period that autistic children start showing a dependent tendency toward their mother. The relationship between mother and child changes. It becomes much closer than that in earlier childhood. However, there is increasing ambivalence in this tendency. On the one hand they feel a need to be dependent; on the other hand they strongly resist their mother's interference, occasioned by their dependence, which they feel to be excessive.

Therefore their psychological confusion results in an eroticized tendency and often develops to the extent that it becomes a very hard problem to solve (Kobayashi, 1990). Mother-child relationships of such a character seem to be particularly conspicuous in our country.

We therefore believe that in this period it is important to perform therapeutic intervention with due regard not only to the therapeutic and educational guidance intended to improve the patients' learning ability or viability but also to a psychoeducational approach that would help resolve the confused mother-child relationship. It might not be an exaggeration to say that the success or failure of the intervention at this period determines the outcome from their adolescence to their adulthood.

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