SOME ASPECTS OF TREATMENT AND HABILITATION OF CHILDREN AND ADOLESCENTS WITH AUTISTIC DISORDER IN NORTHERN-FINLAND

ABSTRACT
Hospital records and data on the treatment/habilitation status of 187 children with autism aged 3-18 years were gathered from Northern Finland. The treatment programs and therapies varied, depending on the trained staff available.

One-hundred and fifty-two (82.9%) children and adolescents with autism received more than one therapeutic intervention or specific training program. The most common therapies were physiotherapy as well as speech, occupational and music therapy. 43.9% of the children and adolescents with autism received specific training according to TEACCH (Treatment and Education of Autistic and related Communication-Handicapped Children), 10.2% according to Lovaas and 30.5% according to the Portage program. Antiepileptic medication had been prescribed to 23.9% and psychopharmacological interventions to 14.9% of the individuals with autistic disorder (AD).

One hundred and seventy-eight subjects out of 187 showed some improvement on the Childhood Autism Rating Scale (CARS), even if no statistically significant difference was found between the outcome of the available habilitation methods.

Key words: Autism, Autistic disorder, Treatment, Habilitation, Education, Child

Marko Kielinen1,2,3, Sirkka-Liisa Linna1,2, Irma Moilanen1,2

1 Clinic of Child Psychiatry, University Hospital of Oulu, Oulu, Finland
2 Department of Pediatrics, University of Oulu, Oulu, Finland
3 Department of Teacher Education, University of Oulu, Finland
Autism is a life-long condition that typically involves a triad of impairments in: 1) social interaction, 2) communication, and 3) imagination. It occurs in 7-16 per 10 000 children (1-5), while the rate of autism spectrum disorders may approach one per cent of the population (6). The diagnostic procedures commonly used have become conceptually more uniform upon the adoption of the new criteria in the DSM-IV and ICD-10 diagnostic manuals (7,8).

The majority of children with autism spectrum disorders continue to have disabling difficulties throughout life. Only a small proportion of those with “classic” Kanner autism or infantile autism are able to live independent adult lives (9), while those with high-functioning autism (HFA) and Asperger syndrome generally improve enough to live without daily support in adulthood (10). In some children with normal intellectual ability the autism spectrum problems may not be obvious until the age of 6 to 11 years or even later, especially in Asperger syndrome (11). There is also a certain risk that these children with a less typical autism pattern will not be identified at all. Left to themselves, they may be quite easy to handle. On the other hand, leaving them alone may lead to the deterioration of acquired and self-help skills as well social isolation.

Intensive research has also opened up new perspectives into the understanding, care, treatment and habilitation of these conditions. Children with autism are in need of special help and adjustment in the school setting, so as to minimize the risk of an educational and social failure. The TEACCH, Lovaas and Portage projects have developed special treatment, care, and habilitation principles for children and adolescents with autism (12-15). Treatment at an early age is a factor that influences the outcome. Thus, the mainstreaming of a 2-to 4-year-old infant into a normal pre-school group is much easier than the mainstreaming of an older autistic individual into a primary grade group (16-18).

The therapeutic interventions in autism are based on a thorough understanding of the condition, and the special-needs support should be adapted to the individual’s abilities and disabilities. However, the choice of therapeutic methods is very often determined by availability. Speech therapy, physiotherapy, occupational therapy, music therapy, holding therapy and riding therapy are usually the therapies of choice in autism. Sensory integration therapy may be useful for individuals who have problems in dealing with complex sensory stimuli or are sensitive to particular kinds of stimuli (19).
Psychopharmacology, i.e. the study of medication used to treat mental disorders, is one of the most rapidly advancing fields of medicine. Psychopharmacals are prescribed for many symptoms in children with autism, most commonly hyperactivity, aggressive and destructive behaviours, self-injury, stereotypies, obsessions, anxiety, depression and sleeping problems. In adolescence and adulthood, particularly individuals with HFA and Asperger syndrome may develop depression or obsessive-compulsive phenomena that interfere with functioning and can be relieved with medication. On the other hand, some individuals may have such overwhelming side-effects that medication is contraindicated for them. Campbell et al. (20) conclude that neuroleptics, such as haloperidol, B-blockers, such as clonidine, antidepressants, such as nonselective tricyclic clomipramine, and selective serotonin reuptake inhibitors, such as fluvoxamine, fluoxetine, have been appropriately investigated. Mood stabilizers, such as lithium, may sometimes effectively control the manic disorder or mood swings in adults with autism (21). Recently, there has also been some interest in the research results on atypical neuroleptics, e.g. risperidone, which may be effective in the treatment of explosive, aggressive, and disruptive behaviors in autism (22).

Children with autism often have epilepsy, either from the first year of life onwards or with onset during childhood or adolescence. It seems that 20-30 % of all people with autism develop epilepsy before the age of 30 years. Even epileptic discharges without clinical seizures may impair their daily life, but can often be alleviated by antiepileptic treatment (23).

There are seldom any ready-made models for helping children with autism in their varying neurological or social functional impairments. The aim of this study was to describe and find out the present status of treatment/habilitation and especially the early interventions used in Northern Finland.

SUBJECTS AND METHODS
The data were collected from hospital records and the records of the central institutions for the intellectually disabled in the Provinces of Oulu and Lapland in 1996-1997. The data collection has been described in more detail earlier (24). Children meeting the full criteria for autistic disorder (AD) according to the DSM-IV and childhood autism according to the ICD-10 were diagnosed as having autistic disorder (7,8). The population aged 3-18 years consisted of 187 chil-
Children with AD, 147 boys and 40 girls. The cumulative incidence of AD in the area was 12.2 (N=187; 95% CL: 10.5-14)/10,000 (24). Because of lacking follow-up information of four children, the assessment of recovery could thus be done of 183 children and adolescents with AD.

Intellectual functioning had been assessed with the Griffiths Developmental Scale II (25) or the WISC (26,27) by clinical psychologists. Special attention was paid to the treatment and habilitation methods, individual therapies and pharmacological interventions.

CARS had been used to classify the severity of autism, and it was here also used as an outcome measure (28). If not previously available, CARS analyses were made for the purposes of the present study by the authors (MK, S-LL) based on all the available information. The CARS classification was divided into three grades: the scores were <30 points for autistic features, 30-36 for mild or moderate autism, and >37 for severe autism. Furthermore, the authors estimated in general, based on all the available data, the overall usefulness of the treatment of each autistic person. As the criteria of autism diagnosis in CARS presume at least mild/moderate autism (≥30), no cases with autistic features (<30) were included in the initial CARS assessment.

The outcome of the subjects was analyzed in relation to intelligence and the methods of treatment/habilitation, such as TEACCH, Lovaas and Portage.

The classification of the pharmacotherapy affecting the central nervous system consisted of five subgroups: neuroleptics, antidepressants, sedative-hypnotics, mood stabilizers, and anticonvulsants (29,30).

Statistical methods

Statistical analysis was performed with SPSS®. Statistical significances were calculated by using the Chi-Square test.

RESULTS

One-hundred and fifty-two (82.9%) children and adolescents with autism received at least two therapeutic interventions and/or specific training programs. The most common therapies were speech-, physio-, occupational and music therapy. The therapeutic interventions other than specific training programs used in the treatment are shown in Fig. 1.

Eighty-two of the children and adolescents with autism (43.9%) attended training programs according to TEACCH, 19 (10.2%) ac-
According to Lovaas, and 57 (30.5%) according to the Portage scenario. During the follow-up, the severity of autism changed in all programs (Fig. 2,3,4). Seventy-three (39.0%) had no specific training program, such as TEACCH, Lovaas, or Portage, but received additional therapies, such as speech therapy, physiotherapy or occupational or music therapy. In addition, parental counselling and instruction constituted a substantial part of all children's treatment.

Statistically significant improvement, as assessed by CARS, took place in the TEACCH, Lovaas, Portage interventions (p<0.001, Chi-Square) (Table I). The individuals who had only one intervention, 18 out of 40 (45.0%) in the TEACCH program, 3 out of 4 (75.0%) in...
the Lovaas program, and 12 out of 22 (54.5%) in the Portage program, had profited by at least one grade in CARS during the follow-up. Though the children in the Lovaas program seemed to profit most, the differences in efficacy between these three interventions were not statistically significant, because of the small groups. Of the individuals who did not receive a TEACCH, Lovaas, or Portage intervention, but had some other therapy or treatment, 45 out of 73 (61.6%) seemed to profit by at least one grade in CARS during the follow-up. When assessing the recovery on the bases of change in CARS raw scores, only nine children with AD out of 183 (4.9%) did not derive any benefit from the treatment, irrespective of the treatment modality.
To 27 individuals (14.9%), pharmacological interventions other than anticonvulsants were prescribed. The pharmacotherapy affecting the central nervous system included neuroleptics, antidepressants, sedative-hypnotics, mood stabilizers, and anticonvulsants. The mean age of starting medication was 8.4 years (range from 3 to 15 years). Neuroleptics, such as haloperidol, chlorprotixen, levomepromazine, perphenazine and thioridazine, were administered to 23 persons (85.2%) and sedative-hypnotics, such as buspirone, nitrazepam and diazepam, to eight individuals (29.6%). One person was received lithium as a mood stabilizer, to improve severely aggressive behaviour. Selective serotonin reuptake inhibitors (SSRI), such as fluoxetine and citalopram, were prescribed to two persons. Five persons used a combination of neuroleptics and sedative-hypnotics. A beneficial effect on the target symptoms was seen in 20 individuals out of 27 (74.1%).

Anticonvulsant medication, such as barbiturates, carbamazepine, valproate and ACTH was given to 44 of the persons with AD (23.9%). In three persons, the carbamazepine or valproate was also used to improve psychological functioning and to reduce behavioral problems. The mean age of starting epileptic medication was 2.9 years (range from 0.1 to 10 years). In 28 individuals out of 44 (63.6%), this medication successfully prevented epileptic seizures.

| Change in CARS               | TEACCH N (%) | Lovaas N (%) | Portage N (%) | At least two of these three interventions N (%) | None of these three interventions N (%) | Total N (%) |
|-----------------------------|--------------|--------------|---------------|-----------------------------------------------|----------------------------------------|-------------|
| at least one grade milder   | 18 (45.0)    | 3 (75.0)     | 12 (54.5)     | 25 (56.8)                                    | 45 (61.6)                             | 103 (56.3%) |
| same grade                  | 22 (55.0)    | 1 (25.0)     | 10 (45.5)     | 18 (40.9)                                    | 28 (38.2)                             | 79 (43.2%)  |
| at least one grade more severe | -            | -            | -             | 1 (2.3)                                      | -                                      | 1 (0.5%)    |
| Total                       | 40           | 4            | 22            | 44                                           | 73                                    | 183         |

Table I. Outcome of specific training programs.
The severity of autism and the outcome in relation to intelligence are shown in Table II. A non statistical trend was found so that the most intelligent ones seemed to benefit most from the habilitation methods.

After the therapeutic interventions during the follow-up, the CARS grade of autism became remarkably milder according to latest hospital records. The difference between the initial and follow-up CARS scores was statistically significant in all age groups (p<0.001 Chi-Square test). When the severity of autism was assessed by CARS for the first time at the age of three to five years, 24 of the children (48.0%) had severe autism, whereas five adolescents in the older age group of 15-18 years (20.8%) had severe autism. However, the difference in outcome between the age groups was not statistically significant. The total numbers of individuals with severe autism were not big enough for the difference to reach statistical significance (Table III).

**DISCUSSION**

Children with autism are in need of special help and adjustment in the school setting so as to minimize the risk of educational and social failure. It is therefore useful to assess the habilitation and treatment of children and adolescents with autism, in order to find out the most suitable modes for each. The local social, public health and educational administrators may lack information of the efficacy of treatment, which would be very valuable for assessing the specific needs and financing. The long distances in the sparsely populated Northern Finland cause an additional difficulty for the people who work with autistic individuals and their families. It is therefore necessary also to develop local operating practices.

| Age groups (yrs) | 3-5 | Boys | Girls | 6-14 | Boys | Girls | 15-18 | Boys | Girls | 3-18 | Boys | Girls |
|------------------|-----|------|-------|------|------|-------|-------|------|-------|------|------|-------|
| Initial CARS     |     | N (%)| N     | N (%)| N     | N (%)| N     | N (%)| N     | N (%)| N     | N     |
| Mild/moderate    | 26(52.0) | 21 | 5 | 73(64.6) | 58 | 15 | 19(79.2) | 16 | 3 | 118(63.1) | 95 | 23 |
| Severe           | 24(48.0) | 18 | 6 | 40(35.4) | 32 | 8 | 5(20.8) | 3 | 2 | 69(36.9) | 53 | 16 |
| Follow-up CARS   |     | N (%)| N | N (%)| N | N (%)| N | N (%)| N | N (%)| N | N |
| Autistic features| 6 (12.0) | 5 | 1 | 36(31.9) | 29 | 7 | 9(37.5) | 8 | 1 | 51(27.3) | 42 | 9 |
| Mild/Moderate    | 37(74.0) | 28 | 9 | 67(59.3) | 52 | 15 | 14(58.3) | 10 | 4 | 118(63.1) | 90 | 28 |
| Severe           | 7(14.0) | 6 | 1 | 10(8.8) | 9 | 1 | 1(4.2) | 1 | - | 18(9.6) | 16 | 2 |
| Total            | 50 | 39 | 11 | 113 | 90 | 23 | 24 | 19 | 5 | 187 | 148 | 39 |
The relatively great number of children with severe AD in the younger age groups indicates a need for special services and financial support for a larger group of children than previously thought (Table III). This may be due to the improved detection of AD in the area.

The CARS rating system has been shown to have good internal consistency (31, 32), good-to-adequate inter-rater reliability and good stability over time (28, 33, 34). On the other hand, it has been criticized of not being suitable to high-functioning individuals with autism spectrum disorders (35) or adolescents, as lower cut-off score i.e., 27 points have been recommended for adolescents (36). In this retrospective study the CARS was the only measure of which the initial evaluations were available. CARS is also used as one outcome method in an ongoing Scandinavian study by Billstedt (37). It also seems to be sensitive enough, as only 9 out of 187 (4.9%) did not show any change during the follow up period in the present study.

No standard pharmacological treatment is prescribed in autism, as the target symptoms determine the choice and length of psychopharmacological treatment. The medication given to the present study subjects was not followed systematically, and the results do not indicate higher usefulness of any special medication in autism. Only two of the children or adolescents with autism received antidepressants, even if depression is common in children and adolescents with AD (38, 39). This might also be due to a failure to detect the symptoms of depression in persons with AD. The minimal use of SSRI’s was due to late advent of these drugs only in 1989 and their restricted use for children in official orders. The use of stimulants for AD was not customary during the present follow-up in Northern Finland.

It was surprising that we did not find any increase in incidence in epilepsy in puberty, as the antiepileptic medication had been begun before the age 11. This might be explained by the rather low number of children who had reached puberty in this study group.

The special programs such as TEACCH and Lovaas were adopted into use in the early 1990’s in Northern Finland. The personnel in day care centres, at schools, in hospitals and in institutions were trained to use these interventions in everyday life. The youngest children in our study group had received early habilitation and treatment. They also showed a good outcome during the short training period.
No single intervention approach or programme for autism was shown to be better than the others (40). The therapies are often long, and some persons may have several therapeutic interventions going on at the same time. It may hence be very hard to determine the real cause for a superior outcome. The choice of the treatment method also depends on the availability of trained staff. The important message of this study is that early, effective and regular interventions in autism really helped and should be provided as early as possible to children with autism.

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