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The dynamics of infantile autism. Longitudinal studies

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Summary

Aim: *Children with diagnosis of autism were estimated at the age of 3, 5, 7 using the diagnostic criteria elaborated on DSM-III-R basis [1, 2].*

Material and method: *28 children diagnosed to be autistic were involved into the longitudinal studies. The criteria were taken from DSM-III-R.*

18 children in the early stage of autism were chosen. The development of disorders has been observed since the period infancy among these children.

The other group consisted of 10 children in the late stage of autism. The development of autism in the group was proceeded by normal development of the child till the 12–18 months of life.

The research was conducted in 3rd, 5th and 7th year of life. 3 areas of developments were taken under consideration: social relations' (A), verbal vs. non-verbal communication (B), activity and interests (C). In the estimated group (A, B, C) 5 criteria were achieved, each in a 5-grade scale, 1 meaning the lack of symptom and 5 meaning the higher intensity. At the age of 3 the intensity of disorders on the three evaluated areas of development did not differentiate children in early and late stage of autism.

Results: *The future development of children in the early stage of autism was not successful. Visible difference was seen at the age of 5.*

Children in the late stage of autism developed in all 3 areas of investigation. At the age of 7, children in the late stage of autism seemed to gradually "withdraw from autism".

Conclusion: *Longitudinal studies conducted on autistic children confirmed the hypothesis about the age of child's life, when the first symptoms of disorders showed, being an important predictor of the autism development dynamic.*

Key words: infantile autism, dynamic, longitudinal studies

Introduction

Research on infantile autism is very rare and very difficult to judge univocally, because:

– infantile autism consists of a varied group of disorders
– basing on this, the dynamics of the course of autism cannot be studied
– ever since Kanner described infantile autism, the classification systems were fre-

quently modified. The disorder diagnostic criteria were not formulated in a precise manner.

In all classifications, social functioning impairment is considered as the key symptom of infantile autism. Catamnestic studies, which are rare and have methodological errors, were conducted along this context. Most of these studies concern the social adaptability of adults with a diagnosis of infantile autism.

From early catamnestic studies [3, 4, 5, 6] it can be seen that only 5 to 18% of those with a diagnosis of infantile autism function independently after turning 18. Cillberg's studies [7] show similar conclusions.

Shapiro and Hertzig [8] studied specific developmental domains of autistic children along with their growth.

Their studies show that the inability to build social relations determines the social non-adaptability of autistic people. Along with growth, the language skills improve slightly, however speech rarely serves social communication. Autistic persons often use echolalia and they rarely create new language forms. A disordered development of emotional expression and inability to empathise persist till adult age.

The last published review of catamnestic studies on persons with autism and Asperger syndrome is by Patricia Howlin [9]. Catamnestic studies were done on persons whose intellectual functioning was average or higher. It was considered that a normal intellectual level is an important predictive factor of the development of linguistic and social adaptability skills in adulthood. However, only a few of those studied did function independently. All of them had difficulty with starting close emotional relationships. Low intelligence quotient was considered as a high risk of worsening of social functions in adult life.

Rutter et al. [4] noted differences in the course of childhood psychosis (in the classifications which were abiding then, autism was part of childhood psychoses) due to the fact that the psychosis was preceded by a normal development in the first 2, 3 years. Kanner in his catamnestic studies did not confirm this relationship (qt. after Rutter).

Our own, multiyear observations of autistic children [10] suggest that the dynamics of the course of autism differs in children where it develops as early as the first 12 months of life) from those in whom the first symptoms appear after normal development (till 12-18 months of life).

The aim of my longitudinal study was to follow the dynamics of the course of autism considering its early and late development. 3 main disorder regions were studied in autism:

A) social relationships
B) verbal and non-verbal communication
C) activity and interests

Material

Longitudinal studies were conducted in 28 children with a diagnosis of infantile autism, diagnosed according to DSM-III-R criteria. 3 years was considered as the age till which autism was to develop. The mean age of the studied group was respectively

3 8/12, 5 6/12 in the next study and 7 2/12 in the third stage.

In the studied group, 18 children were singled out as having a diagnosis of early stage of infantile autism. Amongst these were 14 boys and 4 girls. The second studied group consisted of children with the late stage of autism. This was a group of 8 boys and 2 girls.

Early stage of autism diagnostic criteria:

a) no eye contact, b) no development in speech ability, c) no reaction to mother's presence, d) stereotypes, e) 'awkward' reactions to sounds f\ no interest in toys typical for the child's age group.

Diagnostic criteria for late stage of autism:

– normal development till the 12th to 18th months of life, amongst these:

a) normal development of social contacts with the mother and closest surroundings, b) normal speech development, c) interests typical for the given age group, d) no characteristic symptoms of early stage autism.

The development of late stage of autism had a fast course (in a few weeks) and was preceded by a traumatising situation for the child (being separated from the mother, hospitalisation). The first symptoms were social withdrawal and speech regression in the expressive and non-verbal communication.

At 3 years of age, the clinical picture of autism, the early and late forms, did not differ much.

Children in longitudinal studies were under constant medical care and observation in the Specialist Department for Neurotic Disorders in children in Gdañsk for at least 4 years.

The studies were done in the years 1990-1999. The therapy programme was the same for all the children until their 5th year, and was later on modified individually according to the child's progress in development.

Methods

1. The diagnosis and control studies were based on DSM-III-R [1] criteria. Qualification criteria consisted of 3 domains of disorders noted in points: A- social relations, B- verbal and non-verbal communication, C- activity and interests. In each of the groups studied 5 criteria were singled out, each of which was then noted on a 5 point scale. A note of '1' meant no symptoms (developmental norm), a note of '5' meant maximal intensity of symptoms.
2. Speech development questionnaire.This made it possible to verify the early stages of pre-verbal and non-verbal communication, and its usefulness.
3. Structured clinical interview.This was based on hereditary disease, child's early development, family situation before and after the child's birth, the circumstances in which the first symptoms of autism appeared. The child's development from birth till the first contact was based on an interview and verified by family documentary materials (video recordings, photographs).
4. Analysis of video recordings and photographs. In 11 cases this analysis was solely conducted basing on family photographs on which the child was present. The

analysis of video films and photographs was to verify anamnestic information obtained from the parents.

5. Child behaviour observation with the presence of the parents during a family session when the child was in contact with a medical doctor, psychologist.

The 5-grade scale was evaluated in accordance with 2 competent judges. The same persons conducted the initial and catamnestic studies basing on the same research procedures.

Results

The study results concern the evaluation of changes in the course of autism occurring along with the child's development, taking into account the criteria of differentiating autism into early and late forms. The evaluation concerns 3 developmental domains: social relations (A), development of verbal and non-verbal communication (B), activity and interests (C)

Study I – Social relationships (A); mean age 3 8/12, 28 children studied.

In the initial studies the quality of social contacts did not differ significantly between the children in the early and late stages of autism. They were at a level of about 4.5-5 on the 5-grade scale, which means maximal symptom intensity. These children did not "see" the presence of others about them and did not react to their experiences and emotions.

The ability to imitate and playing with others was at about 4-5 points, if the persons were treated as "mechanical aids" in lonely playing, which was usually stereotypical and different from the manner in which peers played. The children concentrated on mechanical toys or simple useless objects, which were used for stereotypical actions. In the context of the above mentioned behaviour we may say that the children did not understand the rules of social interactions and were uninterested in having any relations with peers.

Study II-Social relations (A)

Early stage of autism; number of children studied – 18, mean age – 5 4/12.

The intensification of changes was in very similar parameters to those in the first study.

Late stage of autism – number of children studied –18, mean age 5 7/12.

In the age of 5 a significant improvement of social behaviour can be noted. The global grade was 3.7 points after 2 years, after being initially at 4.7 on the 5-grade scale.

The qualitative evaluation of the given criteria of social functioning shows that the quality of perceiving others as being the vicinity, as well as registering and reacting experiences of others e.g. crying, laughter or discontent had considerably improved. Similarly a significant change was noted in the ability to imitate. The children waved their hand goodbye, imitated the mother's household actions and often passed them onto the plays they organised themselves. Slight improvement could be noted in the

criteria connected with their ability to participate in common peer play activity. The children studied did not show interest in having closer relations with peers and had a difficulty in understanding the rules of social interaction.

Study III – Social relations (A)

Early stage of autism; number of children studied – 18, mean age 7 1/12

No significant development in social skills could be noted in children with early stage of autism. Initially the result was 4.8, whereas the result of the final study was 4.3 points, on a 5-grade scale.

Evaluation of given categories of social functioning shows that the ability to feel physical presence of others close to the child was at a higher level. Improvement was also seen in the imitation of activity connected with self-service.

Late stage of autism; number of children studied – 10, mean age – 7 3/12

An evident improvement in social development of children in this group was seen

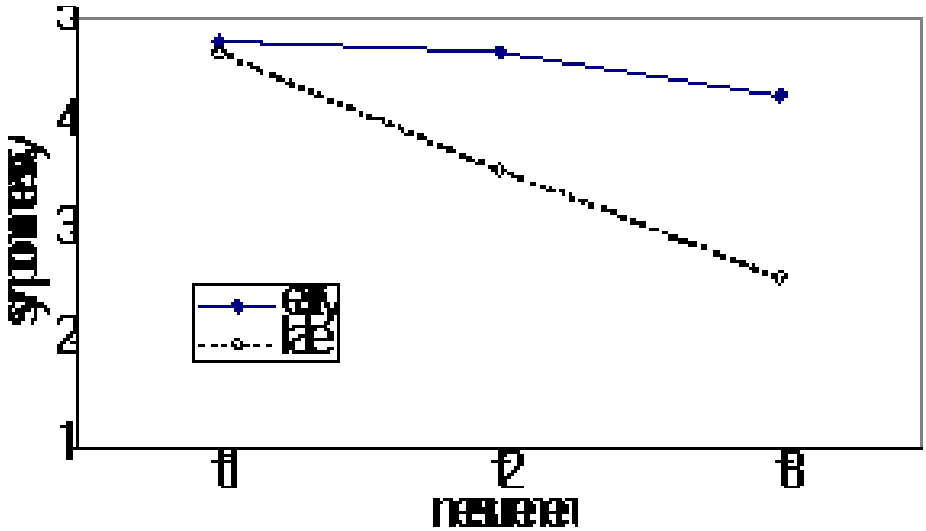

Figure 1. Symptom dynamics as a function of development for early and late onset of autsm: **social contacts**

at an age of 6-7 years. The data obtained from the given categories of social functioning give a result of 2.8 on a 5-grade scale.

The relations with those closest to the child as well as the ability to perceive and feel one's own experiences as: pain, tiredness, seeking comfort in others when in such situations - all these were graded as the highest. In an adaptable manner these children showed emotions in situations such as the coming or leaving of a close person. High results were also achieved in the ability to imitate everyday activities.

Difficulties in spontaneous contacting with peers persisted, but when encouraged, the children participated in common play and understood the basic rules of social interactions. Entering peer groups and submitting to group rules required support from

tutors and teachers.

In the domain evaluating the quality of social relations, the interactions between the groups of children with early and late stage of autism and the intensity of the disorder in the 3rd, 5th and 7th year of life was F (A) (2.51)=11.92; p<0001, which means a high statistical significance. Also, as it can be seen from the figure, it depended on the fact that in the children with late onset of autism the symptom intensity reclined with time, whereas in the group with early onset of autism, symptom intensity did not change much as to the function of age.

Verbal and non-verbal communication (B)

Study I; Mean age of those studied – 3 8/12

In the initial studies, in all the children studied those with the early as well as the late onset of autism, the domain that was deeply disturbed, was the ability to communicate verbally and non-verbally, understood as a substitute to expressive speech.

In children with early onset of autism, the development of expressive speech was inhibited at a very early stage, most frequently at the stage of babbling. Non-verbal communication, if used by the child, was usually an incomprehensible communicate for others and graded as inapplicable in social interaction.

In children with late onset of autism, the development of speech was normal till about the 12-18 months of life and the worsening in this aspect was one of the first signals of developing autism.

In the initial studies there was no significant difference in speech ability between the two groups. On the 5-grade scale it was measured at 4.6 for early onset autistic children and 4.8 in the late onset group.

Study II – Verbal and non-verbal communication (B)

Early onset autism; number of children studied – 18, Mean age – 5 4/12

In the control study at 5 years of age, no significant difference was noted in the development of expressive speech. Non-verbal communications appeared, which were meant to satisfy simple needs of the child e.g. getting a sweet. Direct echolalia appeared in the form that the child would repeat the first or the last syllables of the word he or she had heard. It very rarely consisted in repeating the whole word. Late echolalia appeared only in two children, it was the frequent repetition of “give me”.

Eye contact as a means of contact was forced.

Late onset of autism; number of children – 10, mean age – 5 7/12

A significant progress in the development of expressive speech and non-verbal communication was noted in the 5th year of life. In about the 4th year, the first words appeared and what was more important, they were spoken in the correct context. At about 5 years old the children formulated simple sentences, most frequently they were questions such as “what’s this?” This question was initiated by the child’s interest in the external world and was directed to a given, single person and pointed at a concrete subject or occurrences. The children’s expressions were strengthened by gestures. Direct echolalia had the character of the whole word being repeated or a two-word sequence spoken to the child. Late echolalia was in single words, which usually were

out of context. In direct contact, the children usually kept eye contact.

Study III

Late stage autism; number of children studied – 18, mean age – 7 3/12

In the 7th year of life 12 children of the late onset of autism group spoke single words; their non-verbal communicate capabilities were richer, these were: grabbing the mother by the hand and leading her to the spot where e.g. the sought object was. A shout or sounds of different intensity manifested their hunger or thirst. The intensity of the sound was always connected with the same need. Eye contact could be achieved more frequently.

In the initial studies the verbal and non-verbal communication was measured at 4.8 points, at the age of 5 at 4.6 points and at 7 years of life at 4.4 points on a 5-grade scale.

Late stage of autism; number of children studied – 10, mean age – 7 3/12

Another evaluation conducted at 7 years of age showed further development of verbal communication with the associated adequate forms of non-verbal activity.

The children used speech to start social relations. At about 7 years of age, they used the pronoun "I". They maintained eye contact, which was only broken off in emotionally difficult situations for the child. As far as the characteristics of speech in these children, these were limited melodics and no emphatic emphasising. Speech formation was in stages. Every single, emotional difficulty caused regression in this, followed by an evident jump forward with clear improvement of expression and language enrichment.

Speech development as communication was measured at 2.8 points on a 5-grade s[illegible] p-

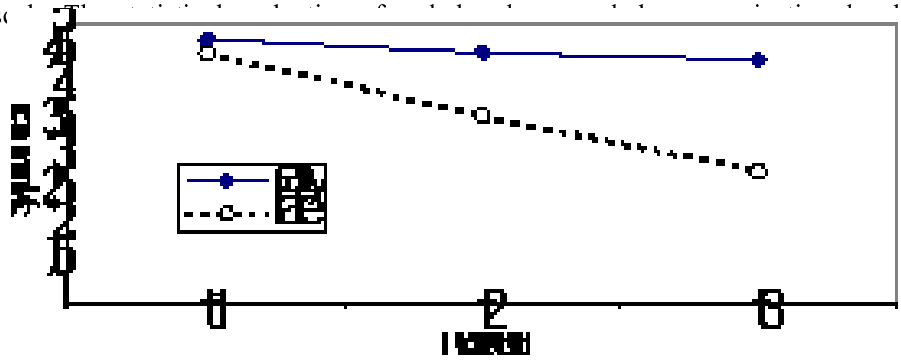

Figure 2. Symptom dynamics as a function of development and early or late onset of autsm: **verbal communication**

ment in children with early and late stage autism, showed the same formulae as in the case of the development of social ability. This interaction was at F (B) (2,51)=8,51; p=. 0001, which means that the intensity of symptoms in children with early onset autism, along with growth, statistically significant improvement was noted in verbal and non-verbal communication.

Activity and interests (C)

Study I; number of children studied – 28; mean age 3 8/12

In the 3rd year of life stereotypies dominated in the behaviour of children with early and late onset of autism. Their interests span was very narrow, which could be seen in monotonous play, usually with the same objects, rarely these were toys adequate to the child's age. Stereotypical object arrangement in the right order, according to shape or colour, stereotypies with useless objects – these are all characteristics of the child's interests. Disarrangement of this order caused clearly the child to be niepokój and the increase in the movement stereotypies.

Initial rating for both groups was at 3.8 points.

Study II

Early stage of autism; number of children studied – 10, mean age – 5 7/12

The first signal of any progress in the domains of activity and interests was the disappearance of movement stereotypies. They only appeared in the situations the child perceived as dangerous. The interests of the child broadened widely. This was noted in the type of play, number of games played as well as the curiosity to explore the world.

The rating was at 3.1 points on the 5-grade scale.

Study III

Early stage of autism; number of children studied – 10, mean age 7 1/12

In the 7th year the interests and activity of this group did not change much. The rating remained at 3.5 points on the 5-grade scale.

Late stage of autism; number of children studied – 10, mean age – 7 3/12

Between the 5th and 6th year, interests in books appeared. Initially this would be in turning the pages and short fixation of attention on animals and objects of common use. Between the 6th and 7th years the children began playing in a manner which required the use of imagination. Stories read by the mother or those watched on television were an inspiration for this play.

Tension due to a change of surroundings and keeping everyday rituals were relieved between 6 and 7 years of age.

Evaluation of the activity domain and interests in the 7th year of life was at 2.6 points.

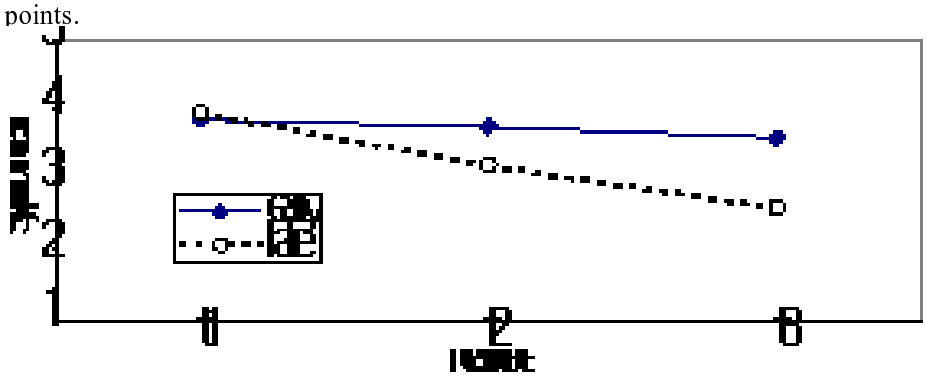

Figure 3. Symptom dynamics as a function of development for early and late onset of autsm: **activity and interests**

Along with development, statistically significant differences could be noted in activity and interests of both studied groups – those with early and late stage of autism.

This dependence is at: F (C) (2.51)=6.51; p=003

Discussion

Longitudinal studies of autistic children confirmed the hypothesis that an important predictive factor of the autism course dynamics is the child's age in which the first symptoms of autism appeared. In children with early onset of autism, its' course was unfavourable. Along with growth, new, pathological symptoms appeared, which perhaps were caused by the deficient development of essential functions for the given growth stage. In the group of children with late onset of autism, new functions, appropriate for the given age were developed along with the child's growth. Besides short-lived stages of speech regression, no other developmental inhibitions could be noted. The development in 3 specific domains, studied every 2 years was rather even, however in the 7th year none of those studied did achieve the developmental norm.

Variance analysis for the 3 studied domains: social relations, verbal and non-verbal communication, activity and interests showed a significant interaction in relation to the two variables: 2 forms of autism and age of the child. In other words, the difference in the intensity of autism symptoms between children in the early and late stage of autism increases along with the child's growth. It is unnoticed in the age of 3, differs in the age of 5, but at the age of 7, in the children with late onset of autism it predicts "coming out of autism".

Why is it that the age of the child when the first symptoms of autism did appear is an important predictive factor of the dynamics? This question suggests a few answers. One of them is based on the concept of biological causes of psychiatric disorders. It may be assumed that, infantile autism develops due to organic changes in the C.N.S. connected to early development pathology. These changes cause an improper development of functions, which form the basis for the development of the next ones, which form along with the child's growth. It is true however, that until now we do not have a definite answer so as to the biological causes of autism, even though many studies are conducted in this area.

Another way of looking for the answer is the connection between autism and the emotional barrier constructed in the course of early emotionally traumatic experiences of the child. The emotional barrier makes achieving contact with the outer world difficult or even makes it impossible. It also inhibits the formation of developmental functions such as speech and social relations. An effect of these disturbances on the development of these two most vital areas of early child development is the appearance and increasing spiralling of autistic symptoms. The earlier the stage of an emotional barrier is reached, the deeper the developmental disorders will be and the more difficult will be the process of activating the "blocked" developmental areas. The question on the essence of autism remains still open.

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