
Identification and early intervention in pervasive developmental disorders

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Pediatricians and child psychiatrists are seeing an increasing number of children with pervasive developmental disorders (PDD). While there are many excellent summaries of autism available, there is a paucity of data on children with the wider spectrum of PDD. These disorders share with autism the characteristics qualitative impairments in reciprocal social interaction, the deficits in verbal and non-verbal communication, and the pattern of repetitive stereotypic activities. However, they differ from autism either with respect to the pattern or number of symptoms, or natural history and course. This chapter will review recent data on the classification, diagnosis, and early management of preschool children with pervasive developmental disorders (including autism, atypical autism and Asperger's syndrome). The focus is on early assessment and intervention (defined as prior to school entry) as there are data suggesting that outcome can be positively affected by early recognition and treatment.

CLASSIFICATION

The term 'pervasive developmental disorder' was introduced by the American Psychiatric Association in the third edition of the *Diagnostic and Statistical Manual*.ⁱ Autism was considered to be one type of PDD but several other types were also specified, including childhood-onset PDD, atypical autism, residual autism and PDD not otherwise specified (PDDNOS). The diagnostic criteria for autism and the other forms of PDD have undergone several changes since this initial formulation and the latest version will appear in DSM-IV shortly.ⁱⁱ These criteria were developed in conjunction with the World Health Organization and so, for the first time, one set of criteria for the different forms of PDD will be used around the world.ⁱⁱⁱ The latest set of diagnostic criteria for autism and the two most common other forms of PDD are presented in Tables 9.1-9.3.

The diagnosis of autism requires evidence of impairments in all three aspects of PDD – social interaction, communication, and repetitive activities. In addition, there must be evidence of impairment in at least one of these aspects of development prior to 36 months of age. Of 12 possible criteria in

Table 9.1 Diagnostic criteria for autistic disorder

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1. Qualitative impairment in social interaction, as manifest by at least two of the following:
 - (a) marked impairment in the use of multiple non-verbal behaviors such as eye-to-eye gaze, facial expression, body posture, and gestures to regulate social interaction
 - (b) failure to develop peer relationships appropriate to development level
 - (c) lack of spontaneous seeking to share enjoyment through joint involvement with others
 - (d) a lack of social or emotional reciprocity

 2. Qualitative impairment in communication as manifest by at least one of the following:
 - (a) delay in or total lack of, development of spoken language that is not accompanied by an attempt to compensate through alternative modes of communication such as gesture or mime.
 - (b) in individuals with adequate speech, a marked impairment in the ability to initiate or sustain conversation with others
 - (c) stereotyped and repetitive use of language or idiosyncratic language
 - (d) lack of varied spontaneous make-believe play or social imitative play appropriate to developmental level

 3. Restricted repetitive and stereotyped patterns of behavior, interests, and activities, as manifest by at least one of the following:
 - (a) encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal to intensity of focus
 - (b) apparently compulsive adherence to specific non-functional routines or rituals
 - (c) stereotyped and repetitive motor mannerisms (e.g. hand or finger flapping or twisting or complex whole-body movements)
 - (d) persistent preoccupations with parts of objects.

 4. Delays or abnormal functioning in at least one of the following areas, with onset prior to age 3:
 - (a) social interaction
 - (b) language as used in social communication
 - (c) symbolic or imaginative play
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Table 9.2 Diagnostic criteria for Asperger's syndrome

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1. Gross and sustained impairment in social interaction as manifested by at least two of the following:
 - (a) marked impairment in the use of multiple non-verbal behaviors such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction
 - (b) failure to develop peer relationships appropriate to development level
 - (c) lack of spontaneous seeking to share enjoyment through joint involvement with others
 - (d) a lack of social or emotional reciprocity

 2. Restricted, repetitive, and stereotyped patterns of behavior, interests, and activities.

 3. Lack of any clinically significant general delay in language (e.g. single words used by age 2, communicative phrases used by age 3)

 4. Lack of any clinically significant delay in cognitive development as manifest by the development of age-appropriate self help skills, adaptive behavior, and curiosity about the environment

 5. Not better accounted for by another specific pervasive developmental disorder
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Table 9.3 Diagnostic criteria for pervasive developmental disorder not otherwise specified (including atypical autism)

This category should be used when there is a severe and pervasive impairment in the development of reciprocal social interaction and of verbal and non-verbal communication skills, but the criteria are not met for a specific pervasive developmental disorder, schizophrenia, schizotypal personality disorder, or avoidant personality disorder. Atypical autism – cases that do not meet the criteria for autistic disorder because of late age at onset, atypical or subthreshold symptomatology, or all of these.

Note: Taken from American Psychiatric Association²*DSM-IV Draft Criteria*, exact wording may change in *DSM-IV*.

total, the child must demonstrate at least six criteria to receive a diagnosis of autism. The difference between the diagnosis and atypical autism is that in atypical autism, either age of onset if *after* 36 months, or else the child does not meet the criteria in one of the three domains. In other words, there might be evidence of impairments in reciprocal social interaction and communication but *not* in stereotypic activities.

The differentiation of Asperger's syndrome from autism is more difficult. The child must meet the criteria for social impairment, repetitive activities, and age of onset but have normal cognitive and language development; that is, phrases by 3 years of age and normal adaptive skills. Unfortunately, the reliability of making these distinctions has not yet been documented and may be a problem particularly in the preschool years.

It is important to recognize that the relationship between autism, Asperger's syndrome, atypical autism and PDD is hierarchical, i.e. autism is a particular subtype of PDD but there are other subtypes as well. Therefore, it does not make logical sense to ask whether a child has autism or PDD but it is possible to distinguish autism from atypical autism. It is still not clear, however, that distinguishing forms of PDD from each other provides important clinical information. There is only limited evidence that the other forms of PDD such as Asperger's syndrome differ from autism on important parameters such as etiology, outcome or response to treatment. A recent issue of the *Journal of Autism and Developmental Disorders* (vol. 22, number 4) has summarized the relevant clinical studies. Hopefully, the specification of these disorders by both the American Psychiatric Association and the World Health Organization will stimulate the research needed to provide more definite information.

PREVALENCE

Several sound epidemiologic studies of autism are available that provide information on prevalence rates and correlates. These have been performed in several countries around the world and, in spite of differing definitions and sampling frames, the results are remarkably consistent. The prevalence of autism appears to be between 4 and 10 per 10,000 with a

consistent excess of males over females.^{4,6} Where information is available on age, higher prevalence rates are seen in younger children, suggesting that either the symptoms abate over time or older cases have been missed. There do not appear to be any systematic differences in socioeconomic status or income.

There are much fewer data on the prevalence of other forms of PDD. Table 9.4 provides a summary of available information^{4,7-9}. One problem with these estimates is that different subtypes of PDD were measured without any common agreement on diagnostic criteria or terminology. Furthermore, none of these studies specifically set out to measure non-autistic forms of PDD and so these estimates should be viewed tentatively. Nevertheless, the data do suggest that the prevalence of these non-autistic forms of PDD may be at least as common as autism, if not two to three times more common. It is not surprising, therefore, that pediatricians and child psychiatrists are seeing increasing number of children with PDD. The recognition of these conditions is now much greater in the community and, presumably, children who were previously classified as being either developmentally delayed or learning-disabled are now being identified as having some type of PDD.

EARLY IDENTIFICATION AND ASSESSMENT

Young children with developmental disabilities are most common identified by parents, family physicians, and nursery school teachers. The age of identification usually depends on many factors including the parents' and professional's knowledge of child development.¹⁰ Parents often first become concerned with their child's development between 18 months and 2 years of age.¹¹ The most common symptom to arouse concern is a delay of language acquisition. In view of the overlap between the age of onset of PDD and the development of language by boys as opposed to girls, physicians often tell parents to wait or reassure them that the child will soon develop speech. As a result, a formal diagnosis of autism or PDD is often not made until the child is 5 or 6 years of age. By this time the opportunity for early intervention and improvement before the child enters the formal school system may have been

Table 9.4 Prevalence studies of pervasive developmental disorder (PDD) (non-autistic subtypes)

| Author | PDD subtype | Prevalence per 10 000 |
|---|-------------------|-----------------------|
| Wing & Gould (1979) ⁴ | Atypical autism | 16 |
| Steffenburg & Gilberg (1986) ⁷ | Autistic-like | 2.2 |
| Burd et al (1987) ⁸ | Atypical PDD | 1.99 |
| Gilberg & Gilberg (1989) ⁹ | Asperger syndrome | 10-26 |

lost. There appears to be a substantial gap between the time that parents first recognize a problem with their child's development and the giving of a formal diagnosis. The problem is that physicians are quite good at identifying delays in language but our knowledge of significant developmental delays in socialization and play is much more limited. The assessment of a child with language delay should also include questions that screen for the presence to impairments in the use of non-verbal behaviors to communicate, impairments in social interaction and a pattern of repetitive activities. Example of several screening questions are given in Table 9.5.

Assessment of verbal and non verbal communication

Approximately 30-50% of PDD children do not develop function use of language. Even among those who are verbal, comprehension of spoken and written language as well as non-verbal communication is also very limited. Although there are some similarities between PDD children and those with language disorders, especially the semantic-pragmatic type^{12,13}, the overall pattern of impairments is quite specific to children with PDD. It is the social use of language that is most impaired in PDD children, not the more format aspects of vocabulary, grammar, and articulation. Children with the verbal type of PDD lack the intention to communicate and use their speech in an idiosyncratic way. They have very concrete and literal interpretations of words and very poor repair strategies when conversation breaks down.

A child should have single words that identify common objects in the environment or that serve a useful communicative function by 2 years of age. Similarly, phrases that include a verb and have functional communicative significance should be present by 3 years of age. Speech only in the context of echolalia, self-stimulation, or only when singing does not represent functionally useful language. Not only is it important to be aware of these formal aspects of language development, but also to inquire about the uses to

Table 9.5 Screening questions for pervasive developmental disorder

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- Does the child seem to want to communicate?
 - Is the child interested in playing or interacting with familiar adults and peers?
 - Does the child want to share his or her enjoyment with others?
 - Does the child respond to the attention of others?
 - Does the child engage in a variety of play activities or do things in a repetitive fashion?
 - Does the child play with toys in an appropriate or inappropriate fashion? Can he/she be easily distracted?
 - Do you have to go out of your way to accommodate your child's play activities?
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- Will the child point to desired objects, nod and shake his/her head in order to communicate?

which language is put by the child. Does language have a limited and restricted use or does it serve a wide variety of functions? For example, parents of young PDD children often say that the child has a large vocabulary but that this is used infrequently and in a limited number of circumstances. These might include requests for food, protests, delayed echolalia as a form of self stimulation, or speech in the context of a preoccupation or obsession (for example, repeating entire scenes from favorite videos). The use of language of share information and experiences, to inquire about other people, and to point out topics of interest are important milestones that are not achieved by preschool PDD children.

It is also important to inquire about unusual aspects of language development that are rarely seen in other children with expressive or receptive language delays: delayed echolalia, pronoun reversal and idiosyncratic uses of speech. A child with idiosyncratic speech might spell his mother's name out to her rather than call her mummy. Similarly, he might refer to his grandparents by their address rather than by the usual endearments. Using made-up words in a consistent fashion to signify a particular object or activity (neologisms) is another aspect of unusual language development seen in higher-functioning verbal PDD preschoolers.

It is also important to inquire about the extent to which non-verbal forms of communication are used to compensate for a lack of speech or limited vocabulary. Children with expressive and receptive language delays will use pointing, facial expression, and will nod and shake their head to communicate their needs. In spite of their difficulties in spoken language, children with simple expressive and receptive language disorders are still also able to communicate quite effectively non-verbally; parents have little difficulty in understanding their child's requests. In contrast, the parents of PDD children are commonly confused by their child's primitive forms of communication and have to guess their child's intentions. For example, often a PDD child will pull a parent by the hand to the refrigerator and just stand there, waiting for their parent to obtain the desire food without indicating exactly which food they desire.

Reciprocal social interaction

The essential factor in the diagnosis of PDD is evidence of impairments in reciprocal social interaction. Even the most high-functioning PDD preschooler demonstrates some difficulty in social interaction although it may be largely confined to interactions with other children.^{14,13} The social impairments of children with other types of developmental disability (i.e. non-PDD) are characterized by delays in the progression from solitary play to play in the presence of other children (but with little or no social interaction) to cooperative play. Because of shyness, or lack of opportunity, or communicative skill, children with developmental delay may have significant problems with peers, but if one inquires closely of their interaction with

parents and familiar adults, levels of social behavior appropriate to their developmental level will become quickly apparent.¹⁶

The essential deficit in PDD appears to be in social-emotional reciprocity, as manifest by the child's response when he is hurt, what he does when he sees someone else is hurt, whether he demonstrates an awareness of another's presence and how he responds to overtures from familiar adults and peers. Spontaneous sharing toys and food and attempts by the child to engage parents and siblings in mutually rewarding activities are other important examples of appropriate social-emotional reciprocity.

It is also important to obtain information on the 'fit' between social behavior and the context in which it occurs. It is not so much that PDD children are socially withdrawn but that their social behavior is inappropriate given the situation. They may be overly friendly with total strangers and at the same time avoid contact with grandparents. A PDD child may interact with siblings and parents but usually only in a very restricted range of activities such as physical play (tickling, chasing, and wrestling) or else as a means to access a particular toy or favourite activity. If the other child or adult does not wish to participate in this repetitive play, the PDD child will become upset and cannot be distracted. Similarly, PDD children are often described as 'affectionate', but this behavior towards a parent is rarely spontaneous and may be primarily a means of accessing sensory stimulation such as smell, touching hair, etc. Furthermore, PDD children may initiate a social overture towards a parent but this is often only used to ask for help or to facilitate a self-stimulatory such as turning on a fan, or the television.

Assessment of play

PDD children generally prefer to engage in activities that are solitary, repetitive, and that result in some type of sensory stimulation. PDD preschoolers develop limited capacity to imitate behaviors and rarely develop complex imaginary play that is variable. For example, PDD children may play with cars but will do so in a very repetitive stereotypic fashion, always making the same sounds and repeating the same action. One of the interesting aspects of the play of PDD children is that toys lose their novelty only after a very long time. For example, a PDD child may watch a single movie many times or play with a particular toy for months without becoming bored with it. Non-PDD children or those with other types of developmental delay may show a restricted range of interests depending on their developmental level, but they eventually become bored or tired with the activity. In addition, the particular interest is so intense for the child with PDD that termination of the play may result in severe behavior problems. Other examples of repetitive activities include stereotypes, rituals, resistance to change, etc. Again, it is important to assess the duration of these repetitive behaviors and the extent to which they represent significant handicaps for the child and the family. How upset does the child become when prevented from engaging in an

activity and does the family have constantly to work around these activities in order to appease the child?

HOW EARLY CAN A DIAGNOSIS OF PDD BE MADE?

One of the problems in the diagnosis of PDD is that the examples of impairments in social interaction, communication and play must be out of context with the child's overall development. Thus, given the child's developmental level, there may not be an opportunity to manifest some of the behaviors needed for a diagnosis of PDD. For example, one cannot inquire about echolalia or pronoun reversal in a mute child and it would be inappropriate to inquire about lack of imaginative play in a child who does not yet have language and a capacity for making symbols. Similarly, a child with a mental age of 2 or 3 would not be expected to develop appropriate peer interactions. Thus, some assessment of the child's overall development level is essential before one can evaluate whether the diagnostic criteria for autism or another PDD have been met.

This becomes particularly problematic if children under 3 years of age are referred for an evaluation. While it is certainly possible to identify these children as being at risk or of being developmentally delayed, the differential diagnosis between PDD, mental retardation, or a specific language delay can be very difficult, if not virtually impossible. Certainly, the greater the evidence of impairments in reciprocal social interaction and the more examples of repetitive stereotypic activities that represent significant handicaps, the easier the diagnosis is, even given a low developmental age. Indeed, studies of home movies indicate very early abnormalities in non-verbal communication and social-emotional reciprocity in infants who later are given a diagnosis of autism.¹⁷

However, there is a group of children who are most mildly impaired in these areas and for whom a definite diagnosis of a non-autistic type of PDD (i.e. Asperger's syndrome or atypical autism) versus some other form of developmental disability is extremely difficult. This is especially true if the child has not been involved in some preschool program to evaluate their response to more structured environments and exposure to other children. In these circumstances, it is often better to make a provisional diagnosis and re-evaluate the child in 3-6 months time. Usually, a diagnosis of PDD can be made by the time the child is chronologically 4 years of age.

MEDICAL ASSESSMENTS

It must be emphasized that autism and the other forms of PDD are disorders of brain. However, the precise nature of the deficit remains unknown. Approximately 10% of children with autism have an associated identifiable neurological disease.¹⁸ Any condition that causes mental retardation can be associated with autism/PDD, although the relative frequency of certain

mental retardation syndromes are different in autism than in the general population. For example, the two most common causes of mental retardation in the general population (Down's syndrome and cerebral palsy) appear to be less common in autism than are tuberous sclerosis and the fragile-X syndrome.

Given the low frequency of associated neurological disease, an important issue is the extent to which medical investigations should be exhaustive, invasive and intrusive. In general, investigations should be conducted if they might influence treatment planning, provide important information on prognosis and outcome or influence family planning. Indications for the most important disorders can usually be obtained by taking a carefully family history, systematically screening for the presence of a seizure disorder, and doing a careful physical and neurological examination. Table 9.6 lists the types of diseases and their relative frequency identified by Ritvo and colleagues in a community study of autism¹⁸. Certainly the two most common disorders to keep in mind are the fragile-X syndrome and the tuberous sclerosis.

There has been considerable debate in the literature as to whether the association between autism and the fragile-X syndrome is greater than one might expect by chance alone¹⁹. Even so, the diagnosis of the fragile-X syndrome has important implications for family planning and should be routinely undertaken in children suspected of having PDD. The phenotypic features associated with the fragile-X syndrome are less apparent in preschool children and are harder to diagnose. Similarly, in view of the presence of normal transmitting males and mildly affected carrier females, the family history may not be classically X-linked.

The association between autism and tuberous sclerosis seems more firmly established. Smalley et al²⁰ have recently undertaken a comprehensive literature review and survey from their own clinical data suggested that between 17 and 58% of children with tuberous sclerosis have autism and between 0.4 and 3% of those with autism have tuberous sclerosis. Once again, in view of the important implications for family planning, a systematic investigation for tuberous sclerosis should be undertaken involving a Woods lamp looking for hypopigmented patches.

Table 9.6 Rate of concurrent diseases in autism (n=232)

| | N | % |
|--------------------------------------|----|------|
| Viral and bacterial infections | 8 | 3.4 |
| Chromosome and generic abnormalities | 12 | 5.2 |
| Metabolic disorder | 7 | 3.0 |
| Spina bifida | 1 | 0.4 |
| Deafness | 2 | 0.9 |
| Eye disorders | 3 | 1.3 |
| Seizures | 34 | 14.7 |
| Febrile seizures | 9 | 3.9 |

Adapted from Rivo et al.

EARLY INTERVENTION

The assumption lying behind efforts at early intervention is that treatment instituted prior to school entry will result in a better long-term outcome than programming once the child enters school. To evaluate this assumption properly, a randomized control trial assigning children to either early or late intervention is needed. A computer-assisted literature search did not reveal any such study. However, a cohort study comparing the outcome of children receiving treatment before or after 5 years of age showed that the group who received early intervention did much better²¹. In addition, there are several reports of various forms of early intervention that suggest that substantial improvement is possible. What is not clear is what intensity and type of early studies that provide evidence for different forms of early intervention depending on the setting and type of intervention.

Specialized settings

Lovaas has reported that highly intensive and structured interventions directed at preschoolers can result in remarkable improvement even up to 11 years of age^{22,23}. Children were assigned to receive either 40 h of treatment per week in a specialized segregated setting or less intensive treatment (usually less than 20h week) This was a cohort study rather than a randomized trial and the decision to place the child in one or other program depended primarily on geography. The therapy provided was highly structured and focused on strict behavioral management principles, including reinforcement for appropriate behavior, some aversive techniques, and withdrawal of positive reinforcers to extinguish maladaptive behavior. In addition, compliance training and imitation were used as needed. Parents were trained as therapists to provide intensive treatment throughout the day.

The outcome results at school entry indicate substantial gains in IQ; frequent placement in normal integrated classroom settings and a marked reduction in autistic behaviors. Also the rates of maladaptive behaviors were much lower in the intensively treated group. This study has generated considerable controversy and the results have not yet been replicated by an independent group. The major problem is that the groups were not randomized so that variables other than treatment intensity could account for the differences. Furthermore, it is unclear whether other, less intensive forms of treatment conducted in *integrated* settings could result in similar improvements. The program is highly specialized, very expensive and probably could not be easily transported to community settings. This limits the usefulness of the intervention program.

Community settings

A number of studies have demonstrated that when PDD children are

integrated with non-handicapped children, significant progress is made in social and communication skills^{24,25,26}. It does not seem to matter whether the normal child is trained to interact with the autistic child or whether the teacher takes an active role in the interaction²⁷. This and other studies provide a firm foundation for the concept of integrating young PDD preschoolers into community preschools.

However, it is important to emphasize that the placement of PDD children in a community preschool requires much thought and careful consideration. The goals of such a placement are to help the PDD child develop the skills needed for survival in other mainstream settings. The program has to be flexible enough to accommodate the PDD child's needs and also enough have staff to make sure that the child benefits from the exposure to other adults and children. A good assessment of baseline skills in socialization, communication and play is needed, rather than a catalog of deficits, so that the PDD child can be encouraged to advance to the next level of development. Very rapid progress is not to be expected and it is unrealistic to hope for completely normal interactions. However, full immersion and participation for many group activities are certainly possible. The best way of teaching the PDD child is through exposure, modeling, shaping and labeling, done within a context of encouragement and structure²⁴. Situations need to be set up so that the PDD child will have the motivation to interact socially with other children and to communicate with his teachers. Use of primary reinforcers such as food or favorite toys can be very useful in this way.

Behavior management

Behavioral problems will inevitably arise in the preschool setting and at home. These need to be seen as a direct result of the underlying disorder and not of the usual reasons for disruptive behavior such as lack of impulse control, attention seeking, etc²⁸. Most frequently, the PDD child's behavior problems arise from poor communication skills, difficulty with transitions, too much sensory stimulation (i.e. a loud bell), difficulty giving up an obsession, or an inability to understand concepts such as sharing and cooperation. The key principle in behavior management is not so much to extinguish the PDD behavior but rather to replace it with more appropriate social, communication, and play skills²⁹. This can be best done by making an inventory of situations that precipitate difficult behaviors and then trying to prevent or avoid the situation if at all possible, or else to make it easier for the PDD child to communicate her needs. Providing structure and routine (with, for example, a photographic calendar of the day's events), not letting the child engage excessively in obsessive activities, being gently socially intrusive, and finding toys and activities that the child finds highly enjoyable can be quite effective in promoting more appropriate development²⁹⁻³¹. By surrounding the child with the communications of others and with the social interactions and responses of others, she is exposed to more developmentally appropriate

behaviors and can model them through learning, particularly if she has some early imitation skills.

It is important to appreciate that behavior problems have an important communicative function. Often, difficult and aggressive behaviors are a signal of some forms of distress and require staff, parents and the physician to identify precipitation and setting events. The emphasis needs to be on positive reinforcement since one of the key elements in the disorder is the absence of motivation to participate in social interaction. Negative reinforcement, punishment, and withdrawal from social situations will only perpetuate this difficulty.

Speech and language therapy

The overall goal of speech and language therapy with PDD preschool children is to encourage the social use of language, to develop more developmentally appropriate communication skills and to broaden the repertoire of communicative functions³². It is important to pay attention to the social use of communication and facilitate these rather than working on articulation, grammar, vocabulary, or the meaning of words. Any form of communication is to be encouraged, whether it involves speaking, signing, pointing or other non-verbal forms of communication. It is also important to recognize preliminary attempts to communicate and to respond to these appropriately. Situations can be set up in order to elicit communicative functions such as having a favorite toy or food out of reach.

As with behavior problems, abnormal or unusual speech patterns should be seen as serving a function that can be met by other more developmentally appropriate communicative functions³². It is important to conduct an assessment as to what function the deviant language serves and then develop a few simple strategies that can be implemented by parents and teachers alike on a regular basis. Withdrawing the child for one-on-one speech therapy should only be used as an assessment tool, as it removes the child from real-life situations that require language and compounds the difficulties with generalization of newly acquired skills. An important goal is to provide the communication therapy in a natural environment³³. Once again, this can best be accomplished in social interactions with toys, books or other activities the child enjoys. Getting the child to repeat certain words does not promote spontaneous language output.

Using language and non-verbal communication in situations that are highly motivating for the child is most helpful in providing a stimulating environment. Verbal communications can be paired with exaggerated non-verbal cues, as well as pictures and photos to enhance understanding and expression. Certainly, augmentative communication aids such as picture books, photographs, etc, can be very helpful and generally accelerate the development of verbal speech³⁴.

Recently, there has been interest in facilitated communication. This is a technique that was developed by Rosemary Crossley in Australia and promoted by Biklen in North America³⁵. Briefly, the technique involves supporting an autistic child's hand or wrist in such a way that he is able to point more effectively at a typewriter or a letter board. Advocates of facilitated communication claim that previously mute children are able to express ideas of unusual complexity and have surprising literacy skills. This phenomenon has led Biklen and others to propose that autism is a form of developmental apraxia with the primary deficit being an expressive one. Autistic individuals are not mentally retarded but, in fact, are surprisingly competent.

Unfortunately, there has been a widespread uncritical acceptance of the use of facilitated communication among both professionals and parents. It is not difficult to understand the enthusiasm with which this technique has been embraced. However, the key issue is the extent to which the communications are truly independent of the facilitator. Are the sentences originating from the autistic child or, just like the Ouija board phenomena, do they originate from the adult facilitator? Up to this point, there have been several separate studies that have attempted to validate the procedure. All have involved situations in which the child is asked a question which the facilitator is either not able to hear or cannot answer. In situations when the facilitator is unaware of these questions, the autistic child is unable to answer correctly very simple questions (see for example, Prior & Cummins³⁶, Szempruch & Jacobson²⁷, Eberlin et al³⁸). This is in stark contrast to their linguistic competence when the facilitator is aware of the question being asked. Thus, there seems to be clear evidence that the communications do not originate from the autistic child but are profoundly influenced by the facilitator.

Facilitated communication may have a role as a hand-over-hand method of teaching non-verbal forms of communication. It may also be a useful starting point if the support can be gradually withdrawn and it can be demonstrated that communications are truly independent. However, as the technique is currently being used, at least in North America, facilitated communication should probably not be employed in treatment settings.

CONCLUSION

Children with autism and other forms of PDD represent a significant proportion of referrals to developmental pediatricians and therapeutic preschools. These children experience considerable difficulties in communication and social interaction with both peers and important adults in their lives. The role of the physician is first and foremost to make a correct diagnosis and arrange for the most appropriate early intervention. It is important to be hopeful about the outcome of very young children with PDD, particularly if they have relatively good non-verbal cognitive and language skills. Recent data indicate that steady improvement is possible as long as the interventions provided are directed toward the essential impairments in social interaction

and communication³⁹. Too often, parents are given a very gloomy prognosis that is based on old studies conducted prior to the introduction of early intervention. Much can be accomplished, but much remains to be learned about the best way to help children with PDD reach their potential.

KEY POINTS FOR CLINICAL PRACTICE

- Consider a diagnosis of pervasive developmental disorder in any child who presents with a clinically significant delay in language, particularly if there are also impairments in non-verbal communication and socialization.
- Although several pervasive developmental disorder subtypes other than autism have been identified, the evidence that these distinctions are clinically useful is not yet available.
- The medical assessment of the child with pervasive developmental disorder should include a good physical examination, a detailed family history and a thorough evaluation for the presence of seizures, tuberous sclerosis and fragile-X syndrome.
- Children with pervasive developmental disorder symptoms who are under 36 months of age should probably not be given a diagnosis of pervasive developmental disorder, but carefully followed to gauge their response to early intervention.
- Early intervention appears to improve the outcome of children with pervasive developmental disorder
- Integration with non-handicapped peers in community preschools can result in improved social skills.
- Speech and language therapy should be done in natural environments with a focus on the social use of verbal and augmentative forms of communication.
- Behavior management involves an assessment of settings that precipitate difficult behaviors and either changing the environment or providing the child with alternative ways of achieving the same ends.

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