



Autistic Spectrum Disorders

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Autism has attracted a remarkable degree of interest and concern from clinicians and researchers alike, more so in recent times. It is a complex neurodevelopmental disorder that is behaviourally defined and is usually apparent from early childhood (Tuchman R, 2003, Volkmar, Sher & Cohen 1985). It is characterised by profound deficits in communication and social understanding and by ritualistic and obsessional behaviours (Howlin 1998). Wing (1996) postulated that people with autism are alike in that they share the triad of impairments that underlie the condition. The triad emphasises the fundamentally social nature of the disorder. There is a co-occurrence of impairments in social interaction, social communication and social imagination, flexible thinking and imaginative play.

A wide clinical spectrum:

The syndrome of autism can occur in individuals of all levels of ability and a tremendous range exists in the expression of the disorder. These diverse expressions within and across individuals present particular challenges for assessment and treatment.

Family studies point to a range of deficits, in first-degree relatives of autistic children in the following three areas – social dysfunction, communication impairment and stereotyped behaviour (Fombonne et al 1997). They identified lesser variants of the disorder or broad phenotypes of autism in first-degree relatives. The mild variant of the broad phenotype included abnormality in only one area – communication or social interaction or stereotyped behaviour. A severe variant included abnormalities in at least two of these three areas.

Wing (1981) used the term 'Autistic Continuum' and later (Wing 1996) the Autistic Spectrum allowing for a broader definition of autism encountered in the disorder. The use of these terms (continuum and spectrum) emphasised the wide range of social difficulties. The solitary withdrawn child with little emotional expression is at one end. The passive child who does not resist social interaction lies in the middle of the continuum. At the other extreme end of the continuum is the child who interacts actively but in an odd way without relating to the needs or concerns of the persons approached.

The degree of social dysfunction is further complicated by developmental changes within the child. From a withdrawn and isolated toddler, the individual may end up as an 'active but odd' teenager. However, the underlying problem still exists and impacts various aspects of social and learning skills. (Jordan, R. Unit 2, Social & Emotional Needs, 2000).

Different levels of cognitive, communication and language abilities further complicate the varying clinical pictures of ASD. The verbal, bright but socially inept child in mainstream school contrasts markedly to a non-verbal, withdrawn and isolated child who is in a special centre. Although an association between cognitive ability and severity of autism has been indicated (Shah & Wing, 1983), social impairment has been seen to occur in ASD individuals with normal or superior intellectual functioning. It is from the highly able autistic individuals that we have learnt more about the disorder (Grandin T, Williams, D.) Atypical Autism, Pervasive Developmental Disorder, PDD NOS, Aspergers Syndrome, Semantic Pragmatic Disorders are the various labels given

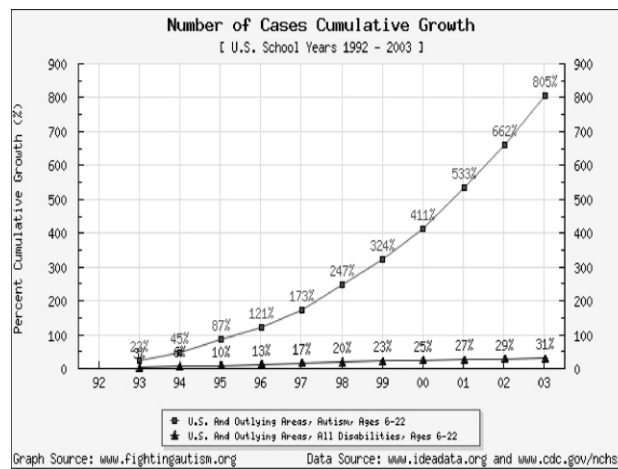


to the differing pictures of autism spectrum disorders (Wing 1997).

Epidemiology and Prevalence:

Recent studies have yielded prevalence estimates that are much higher than those reported earlier (Bryson 1997, Wing 1993). From 4 to 5 per 10,000 persons (Lotter 1966), the prevalence seems to have increased to 1 per 1000 (Bryson, Clark and Smith 1988, Sugiyama & Abe 1989) to 1 in 131 in Granite bay California, 1 in 138 in Kingston UK and 1 in 151 in Brick Township, New Jersey USA. Broader criteria used for inclusion, an increasing awareness of its expression in both cognitively impaired and cognitively capable individuals and exhaustive screening of geographically defined populations maybe the reasons that have yielded higher prevalence rates (Bryson 1997, Fombonne, 1999). However, there are a number of recent studies, most with small samples, and several reports from school systems that found even higher rates of autism.

Higher prevalence rates are seen among the male gender compared to female gender (Lotter 1966, Wing and Gould 1979) and among first-generation immigrants (Gillberg et al 1987, Wing 1980). Wing and Gould (1979) also noted that 30 percent of the disabled population suffered from autism.



The Nature Of The Problem:

Autism defines children at a behavioural level but is associated with multiple aetiologies. However, all have deficits in social cognition and communication.

Social Impairment:

The hallmark of ASD is disturbance of social development. As Wing (1981) noted, it is the underlying social difficulties, which impact interpersonal relationships, communication and contribute to inflexibility of behaviour and thinking. The resulting social impairment leads to socially inept behaviour in the child with ASD.

At the superficial level this implies seemingly odd or irrational behaviours. At a more profound level, social difficulties encompass the individual's understanding of how the world functions. This is caused by the fact that many of the children are unable to be part of social units like mother-child, family, friends and community. This inability reduces opportunities for social transactions, which further affect social development. Hence a relatively small social disability has a pervasive effect on



the later social development, which gradually becomes profound.

The social impairment impacts almost every aspect of the child's functioning, whatever his or her intellectual ability (Howlin 1998). It can lead to inappropriate and unacceptable behaviours in various social situations, causing the child to be ostracised. It can also lead to deficits in socialisation with difficulty in interacting with people and making friends.

In normal development social responsiveness is seen as early as 2-3 months when a baby smiles at its caregiver. It responds to its own name by 7-10 months and waves goodbye by 9-12 months. The perceptual ability enables children to learn how to respond socially. At 18-24 months they perceive when they are hurting others and either repeats the act to check on the response or comfort them by kissing, stroking or appeals for help. They start to perceive social rules and who transgresses them. They also become aware of others feelings and attempt to comfort others in distress. Around this age they start using humans as social tools - appealing for help, using their perception as a reference point and draw their attention to others breaking rules. Toddlers also develop a pro-social act of sharing.

The whole gamut of social responses appears to be disrupted in ASD, even when they maybe functioning well in other areas of life like self-help skills or academic tasks.

Understanding others is an important mechanism by which humans blend together in groups, families and communities. It allows learning of self-control, co-operation and collaboration. Individuals with ASD have difficulties understanding others from a very young age.

As early as one year children are aware of anger in others and show distress, whilst 18 month olds rarely ignore disputes in others and by 3 years children draw attention of adults to transgressions of peers. Two year olds can recognise and empathise distress in others whilst three year olds are also aware of what situations gave rise to that distress. (Jordan, R. Unit 2, Social & Emotional Needs, 2000) Children with ASD do not distinguish well between objects and people and also behaviour between people and people. They do not perceive people's feelings and appear to lack empathy.

They fail to develop a sense of oneself or personal agency (Russell 1996). In the same way they do not develop the concept of others and their 'selves' as described by Frith (1989) in the concept of 'Theory of mind'.

Theory of Mind or Mentalising ability is a complex social skill. (Jordan, R. Unit 2, Social & Emotional Needs, 2000) It differs from superficial social competence, which includes behaviours like gaze contact, imitation and turn taking. Theory of mind is the awareness a child develops that other people have a variety of mental states. These include attributing mental states such as 'knowing' and believing other people and also oneself. Individuals with ASD, not only do not understand what others are thinking and feeling, they do not even understand what they themselves are thinking or feeling (Baren-Cohen S., Leslie, A. and Frith, U., 1985).

Communication problems

Language and communication problems are one of the defining characteristics of autism (Coupe Okane Goldbart 1998). The range of language and communication skills varies tremendously across the continuum. It is clear that the fundamental problem lies with communication rather than language per se. Non-verbal forms of communication are affected and even when language is present, its use as a communication tool remains poor. In normal developmental pattern, communication precedes language and is the prime reason for learning it. This pattern is disrupted in autism leading to delay and deviant language development. It is not mere acquisition of language structure, which in fact may be well developed, but rather its use and meaning, which is affected (Coupe Okane Goldbart 1998).



Early communicative consists of shared attention, imitation, turn taking, social organisation, mutual gaze, communication intention and communication comprehension. These behaviours are deviant or delayed in autism.

Shared attention is seen very early. Around 9–14 months infants show clear signs of wanting to share other people's attention, indicating joining points of reference (such as the light or fan). Not only do they indicate the objects but also at the same time look at people as if to check whether they too are interested and perhaps looking at the same thing (Mundy and Sigman 1989), something that children with autism cannot do.

The process of imitation is crucial in developing an understanding of others (Bremner 1988). Imitation is the earliest form of social interaction. True imitation occurs when the child can decide which action or sound is to be copied. It is at this level of imitation that the child understands the concept of others at a cognitive level. Imitation is almost always active and creative. It is never a perfect copy. Imitation is also fundamental to the development of the representation of language (Piaget 1951). Individuals with ASD may have a 'parasitic' quality to their imitation i.e. they exactly copy the perceptual features of the behaviour.

Robson (1967) noted that mutual gaze was a fundamental form of human communicative behaviour and lent a framework to other modalities of communication. The child and adult spend periods of intense eye-to-eye and face-to-face communication (Brazelton 1979). The reflexive gaze is modified into gaze coupling which is a turn taking interaction that resembles later gaze patterns seen in mature conversation (Jaffe et al 1973). Individuals with ASD, whatever the intellectual level, show disruption of mutual gaze in early development. Gaze avoidance or excessive / inappropriate use of gaze are part of the clinical picture of ASD.

A variety of social organisational strategies are used for communication (Coupe Okane Goldbart 1998). These are needed for initiating, maintaining or terminating a communication like calling out, question/answer, breaking off conversation or repairing misunderstandings. Skills acquired through infancy through interpersonal interactions underpin the skills needed for these conversational and discourse management (Coupe & Jolliffe 1988). Individuals with ASD lack strategies to organise communication. It is probably more evident in high functioning verbal individuals who are capable of conversation.

The turn taking that is seen in a social interaction or dialogue starts with the adult leaving space for children to fill their turn with sounds or actions. Individuals with ASD have difficulty with turn taking at a very early age, both in vocal interactions and physical tasks.

Communication intention is the reason or goal of communication in the mind of the speaker i.e. the "why" one communicates. Children initially use situational cues and gestures to assist comprehension. The comprehension gradually depends more and more on linguistic input. Some examples of communicative intentions are drawing someone's attention to an object or making a request or giving information (Okane & Goldbart 1998). Others include gaining attention for communication like a tap on the shoulder, drawing attention to something to another person like saying 'oh look', and intention to regulate social contact. Along with impairments in perception and mentalising ability, individuals with ASD lack communication intentions, which adds to their social impairment.

Comprehension in context starts in the first 6 months of life where infants start to 'read' the signals and expressions of other people's behaviour. It gradually develops into a highly developed area of expertise, which allows individuals to abstract meaning from the adult's intonation patterns, voice quality and facial expressions.

The individuals with ASD will have difficulty in all the areas of early communicative behaviours affecting their language development, socialisation and their ability to express themselves.



Language problems

Though it is communication rather than language, which is impaired in autistic spectrum disorders, language is affected in most individuals with ASD. Lord and Rutter (1994) estimated that around half of all children fail to develop functional speech. Spoken language ability in autism can range from muteness to an apparent facility. Even with good expressive vocabulary there is a persistent and pervasive impairment in the communicative use of language, and in understanding complex or abstract concepts (Lord and Rutter 1994). The typical speech in autism tends to be non-productive, echolalic, pedantic and uttered in a monotone. Its use to share experiences, express feelings or emotions, or to converse is restricted to high functioning asd or Asperger Syndrome and that to in a limited way

Cognitive impairments

The ability to plan, to arrange events in order and to postpone the need for gratification is referred to as 'executive abilities' or Executive Function. They are necessary for the development of time concepts; motivation and 'common sense' (Ozonoff et al 1991) Happe (1994) pointed out that executive functions are deficient in Autistic Spectrum Disorders. This resulted in typical behaviour in individuals with ASD, which was rigid, inflexible and perseverative. They found it difficult to apply their large store of knowledge meaningfully, often were impulsive and narrowly focused on detail (Cumin, L., Leach, J., Stevenson, G., 1998).

All humans, from a very young age demonstrate an inherent drive to seek out meaning, pattern and coherence from details presented to them - Central Coherence (Frith 1989, Happe 1994). In autism, individuals failed to see the picture as a whole and tended to fragmentary processing. The failure to draw together diverse information to construct higher-level meanings in context led to specific problems (Frith 1989). These included the insistence on sameness, attention to detail rather than whole, insistence on routine, obsessional preoccupations and existence of special skills.

Memory:

Memory processing differs qualitatively in individuals with autism. Impairment in the 'Theory of Mind' leads to an inability to reflect on their own thinking. Hence, remembering facts related to personal events pose a problem but other memory remains unimpaired and maybe exceptional. People with autism find it difficult to remember episodes where there is a personal element included and when there is no external cueing. They find it difficult to remember him or herself performing actions, participating in events and possessing knowledge and strategies (Jordan and Powell 1995). The experiencing self in normal development is able to search their memory and does not need specific cues. This peculiar memory-processing problem is impaired personal episodic memory.

Problem Solving:

Jordan and Powell (1995) noted, that problem solving was difficult for these children because their poor self-awareness that prevented them from reflecting on their own abilities to solve problems. They also said that the highly attention specific style of thinking of autistic children affected their problem solving ability. It led to inflexible attention, which could not be readily harnessed or moulded to the need of the situation. Their oversensitive and idiosyncratic perception faculties also aggravate the problem solving impairment. Over reaction to situations cause panic attacks and difficulty in problem solving.

Emotional Problems

Individuals with ASD fail to understand others' mental and emotional states, which results in other people appearing



confusing. This leads to children with ASD withdrawing and failing to engage with people. Hobson (1993) believes that due to a biological deficit, they failed to perceive emotions in others and thus could not empathise or relate to them. The ability to recognise, interpret and express emotions is rooted in early perceptions and social development. Children with ASD have emotions and feel but have difficulty expressing them and communicating them. The inability to relate to others affects development of friendships. Moreover, emotional immaturity results in uninhibited expression of emotions, especially negative ones. This results in an inability to control emotional outbursts, which can be disruptive. High functioning ASDs are more likely to suffer from its consequences as their emotional development is far below their intellectual and academic ability making it more unacceptable (Jordan and Powell, 1995).

Emotional immaturity also affects learning, as children with ASD are unable to motivate themselves to learn. They do not see the need to please teachers or parents so will not learn a task just to please them, a feature seen to aid learning in non-autistic children. The stress of new tasks may lead to emotional outbursts and withdrawal instead of stimulating learning.

Thus impairment in emotional development affects socialisation, behaviour and learning in children with ASD.

Assessment:

The important goals of assessment include a categorical diagnosis of autism that looks at differential diagnosis, a refined precise documentation of the child's functioning in various developmental domains and ascertaining presence of co-morbid conditions.

A categorical diagnosis of autism and placement in its subtypes has important implications for intervention, prognosis and legal rights (Cohen & Volkmar 1997). However, a rigorous assessment of its core symptoms psychological assessment, communication and behaviour are critical to treatment.

There is a need to evaluate functioning in intellectual abilities both verbal and performance, social competence receptive and expressive language skills and social use of language and self care and other abilities of daily living to place an individual in a broader developmental framework (Cohen & Volkmar 1997).

There is a higher risk of certain co-morbid conditions that occur with autism. These require to be identified and need clinical attention. Co-morbidity includes medical disorders like PKU, Fragile X, Tuberosclerosis, Rett's Disorder and Down's syndrome. Epilepsy is seen to occur in 25% of individuals with autism and needs to be ruled out. Psychiatric and behavioural difficulties like hyperactivity, obsessive-compulsive phenomena, self-injury, stereotypy, tics and affective symptoms may need pharmacological intervention (Brasic et al 1994, McDougle et al 1995, Ghaziuddin Tsai & Ghaziuddin 1992).

The evaluation should include a careful development and health history especially of the first 3 years of life. Real examples of behaviour like eye contact, response to name, finger points to share attention etc often provide better descriptions (Schopler & Reichler, 1972). A diagnostic examination should include observation of the child during structured and unstructured periods. Social deficits are more obvious during unstructured times and in school recess. Areas of observation and inquiry should include (a) social development (b) Communication (c) response to environment (d) play skills (e) self-awareness (f) motor behaviours like hand flapping (g) behaviour problems. Some of the diagnostic instruments that are available are, Childhood Autism Rating Scales (CARS) The Autism Diagnostic Interview (ADI-R) (Lord et al 1994), Autistic Continuum (), The Autism Diagnostic Observation Schedule (ADOS Lord et al 1989). Of these the most comprehensive available are ADOS and ADI, which together provide a structured detailed interview and an observation method to assess objectively an individual's social ability, communication skills and behaviour.



Psychological assessment should be done using standardised procedures. Nonetheless, minor clinical modifications may be necessary as the usual verbal instructions and social reinforcements may not be enough in children with autism (Klin et al., 1997). The results obtained must be viewed with caution and made explicit in the report. Some of the tests that are used are Wechsler's Preschool and Primary Scale of Intelligence (WPPSI-R 1989), Wechsler's Intelligence Scale for Children (WISC-III, 1991), Kaufman-Assessment Battery for Children (K-ABC Kaufman & Kaufman 1983) and Leiter International Performance Scale (Leiter 1980). Such tests provide acceptable measures of current developmental level but have poor predictive value and stability over time (Klin et al., 1997). Children with autism have strengths in visual perceptual tasks like puzzles and weakness in conceptual and reasoning tasks. This observation highlights the importance of emphasizing the latter in management programmes.

Similarly play, communication and social Emotional Functioning should be assessed using standardised batteries.

CRITERIA FOR AUTISTIC DISORDER DSM IV Criteria

A total of six or more manifestation from 1,2 and 3 below:

1. Qualitative impairment of social interaction (at least two manifestations)
 - a. Marked impairment in the use of multiple types of nonverbal behavior such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interactions:
 - b. Failure to develop peer relationships appropriate to developmental level:
 - c. Lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g., by lack of showing, bringing, or pointing out objects of interests): and
 - d. Lack of social or emotional reciprocity.
2. Qualitative impairment of communication (at least one manifestation):
 - a. Delay in, or lack of, development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication such as gestures or mime):
 - b. In individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others:
 - c. Stereotyped and repetitive use of language or idiosyncratic language: and
 - d. Lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level.
3. Restrictive and stereotyped patterns of behavior, interests, and activities (at least one behavioural manifestations)
 - a. Encompassing preoccupation with one or more restricted, repetitive, and stereotyped patterns of interest that is abnormal either in intensity or focus.
 - b. Apparently inflexible 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): and
 - d. Persistent preoccupation with parts of objects.

Delays or abnormal functioning, with onset before the age of 3 years, in at least one of the following areas:

- Social interaction
- Language as used in social communication; and
- Symbolic or imaginative play.

A determination that Rett's disorder or childhood disintegrative disorder does not account better for the observed symptoms.

INTERVENTIONS

Early intervention is the key. :

A new report from the National Research Council of the National Academies USA (2003) encourages promotion of routine early screenings of children for autistic spectrum disorders, much like they are promoted for vision and hearing problems.



Early diagnosis is important because prompt educational intervention is the key to greater progress in children's mastery of fundamental communication, social, and cognitive skills. Deficits in joint attention, affective reciprocity and theory of mind can be identified early and then specific intervention can be implemented. Early intervention uses the plasticity of the brain to maximize potential. An intensive instructional program wherein the child is engaged in systematically planned, and developmentally appropriate educational activity toward identified objectives is crucial. The priorities of focus include functional spontaneous communication, social instruction delivered throughout the day in various settings, cognitive development and play skills, and proactive approaches to behaviour problems. To the extent that it leads to the acquisition of children's educational goals, young children with an autistic spectrum disorder should receive specialized instruction in a setting in which ongoing interactions occur with typically developing children.

There are many behaviors that ordinary children learn without special teaching, but that children with autism may need to be taught (Klin et al., 1992). A preschool child with autism may have learned to count backwards on his own, but may not learn to call to his mother when he sees her at the end of the day without special teaching. A high school student with autism may have excellent computer skills but not be able to decide when she needs to wash her hair. Educational goals for these students, as part of addressing independence and social responsibility, often need to address language, social, and adaptive goals that are not part of standard curricula. Understanding the nature of autistic spectrum disorder and the full range of developmental sequel that follow from the deficits assist the development of teaching approaches and curricular content that address each of these areas. The exact skills, which need to be taught, will depend on the degree of impairments seen in that child. However, they should cover the main developmental areas affected in autism. These include social interaction, communication and language and flexible and creative thinking.

Apart from the curricular content, teaching strategies also need to take account of specific psychological dynamics in both the social and cognitive processing of learning in autism. Robinson (1998) summarised the principles of more effective teaching strategies that take into account the difficulties with social interaction, communication and imaginative/creative thinking and the relative strengths in visual skills, visual memory, good focus in repetition, precision and consistent accuracy. The strategies included low arousal; specifically focused stimuli; directive interventions; reductions in transitioning; and structured and cued teaching with the presentation being more visual.

Apart from education, other intervention programmes to enhance social and communication development are available for children with autism. The two highly debated approaches are the traditional behavioural approach (Lovaas 1981) and the relationship based developmental model (Greenspan 1992). The former is based on learning theory principles. Intervention entails specificity of purpose, goals and activity structure. Skill acquisition reflects the mastery of a series of discrete sub skills. The model emphasizes precision and organisation during instructions. There is complete adult control during the sessions. Through prompting and shaping techniques and immediate reinforcement of correct target responses, the adult shapes the child's learning. Some of the criticisms raised to this form of intervention are the artificial nature of the instructional setting, an emphasis on specific child responses to adult directed interactions and the lack of clear link between the instruction and social use of the skill (Quill 2000). Koegal and Koegal (1995) remarked that discrete trial approaches are counterproductive for spontaneous, self-initiated social and communication skills.

The relationship-based developmental model is framed within the study of typical child development. Intervention emphasizes the development of skills through active exploration and positive social interactions. It emphasizes naturally occurring situations as the context for instructions, child directed activities, and the adult's role as merely a facilitator. The child's internal motivation propels active engagement and the responses of the adult to the child's initiations and interests lay the foundation for the developmental process. Internationally and meaning are assigned to the child's behaviour (Greenspan 1992). The drawbacks of the relationship-based model are the open ended quality of the instructional environment and reliance on the child's initiations to guide the interactions. In autism, where children may lack the skills like joint attention,



imitation and the desire to interact, this model may not be beneficial (Quill 1995).

Quill advocates combining behavioural and developmental approaches for a more eclectic and 'Best Practice' approach. Creating motivating, meaningful activities in natural environments to promote spontaneous social and communication skills along with specialised supports to compensate for the various core skills deficit are recommended.

Intervention approach	Theoretical background	What happens
TEACCH Treatment and education of	Good visual learning skills; absence of sense of the world	Visual structure and teaching strategies - Physical structure, visual schedules and work systems
Intensive Interaction (Nind & Hewett 1994)	Based on model of care-giver-infant interaction	Regular frequent interactions between therapist and child in which there is no task or outcome focus but the primary focus is the quality of the interaction itself. Get to know the child, follow his lead and give him time to initiate and respond to interactions
PECS Picture Exchange Communication (Bondy 1996)	80% of autistic children did not have useful speech by 5 years. Pictures are used to develop spontaneous communication	The child to communicate his needs uses pictures. Initially two adults train the child with prompts to get his favourite toy/food/drink by using a symbol/picture representing it to get it.. Gradually the child develops a PECS vocabulary and uses it to communicate
Applied Behaviour Analysis (Lovaas 1987)	It is based on the theory that all behaviour is learned and that its antecedents and consequences govern it. It is based on Skinner's Theory of 'Operant Conditioning' (1960)	Tasks are broken up into steps that are taught through rewards. It is intensive and requires 40 hours a week for approximately 2 years. Apart from skilled staff, periodic and objective assessment and suitable reinforcement is needed. The treatment should be started early before the age of 42 months.
Verbal Behaviour (Michael, J. 1983)	This too is based on Skinner's Verbal Behaviour (1957). He views language as behaviour with formal and functional properties. The latter include Mand, Tact, Receptive, Echoic, Intraverbal that are functions of a word.	The child is first taught the 'Mand' as satisfying a demand is the most rewarding. Gradually setting up 'establishing operations' (motivation) the child is taught, language through consequences of verbal behaviour. Like ABA, skilled staff, parental involvement and intensive interaction is necessary.



Some Medications used (Rapkin 1990):

TYPE OF DRUG	EXAMPLES	INDICATIONS	PRINCIPAL UNDESIRABLE EFFECTS
Stimulants	Methylphenidate, pemoline	Attention deficit-hyperactivity	Irritability, aggressiveness, stereotypies, tics, sleeplessness; in rare cases, hepatotoxicity of Pemoline
Noradrenergic agents (beta-blockers and 2 agonists)	Propranolol, clonidine (e.g., patch)	Explosive behavior, aggressiveness	Depression, nightmares, sleepiness, hypotension, dry mouth
Serotonin-reuptake Inhibitors and agonist, Antidepressants	Fluoxetine, clomipramine, Sertraline, fluvoxamine	Perseveration, obsessions, rigidity, aggressiveness, depression	Dry mouth, sleep disturbances, constipation, agitation, restlessness
Dopamine-receptor blockers	Haloperidol, thioridazine, Chlorpromazine, pimozide, risperidone, olanzapine	Aggressiveness, destructiveness, self-injury	Sedation, affective blunting, dystonia parkinsonism, tardive and withdrawal dyskinesias
Anxiolytics	Buspirone	Anxiety	Sedation, restlessness (rarely), gastrointestinal symptoms
Opioid antagonists	Naltrexone	Self-injury, stereotypy	Long-term effects unknown
Mood stabilizers	Lithium, valproate, carbamazepine	Mood lability, aggressiveness	Tremor, weakness, need to monitor blood levels
Anticonvulsants	Valproate, carbamazepine, lamotrigine, vigabatrin	Epilepsy; possibly autistic regression with epileptiform EEG (including electrical status epilepticus in slow-wave sleep) without clinical seizures	Drowsiness, ataxia, rashes; hyperphagia and tremor with valproate
Hormones Sleep aids Glucocorticoids	Melatonin Corticotropin, prednisone	Sleep disturbances possibly autistic regression with epileptiform EEG (including electrical status epilepticus in slow-wave sleep) without clinical seizures	Long-term effects unknown Obesity, hypertension, infections, psychosis



To summarise, autistic spectrum disorders is a complex developmental disorder with social and communication dysfunction at its core. Wing (1996) showed that a wide spectrum of conditions have a common triad of impairments. Deficits include those in social communication, social interaction and social imagination (flexible and creative thinking). Since autistic spectrum disorders occur on a continuum, the clinical expressions differ widely. They can range from a severely handicapped child to a child with normal intelligence attending mainstream school. Hence persons with superior intellect with asd will also have social and communication difficulties. Even mild or subtle difficulties can have a profound and devastating impact on the child. To be able to provide suitable treatments and interventions the distinctive way of thinking and learning of autistic children has to be understood. The core areas of social, emotional, communication and language deficits have to be addressed at all levels of functioning. The interventions have to be adapted to the individual's chronological age, developmental phase and level of functioning. Nonetheless, there should be a general emphasis on teaching social cognition, on learning communicative and social skills and on enhancing motivation. In addition to the content of the intervention programme, the strategies of curriculum delivery and teaching the child with autism is distinctive and requires consideration at all levels of the spectrum. The general principles include presence of structure to increase predictability and strategies to reduce arousal of anxiety.

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