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Autism Spectrum Disorders — Diagnosis and Management

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Abstract Autism Spectrum Disorder (ASD) is a neuro-developmental disorder commonly seen in children. It is characterized by age inappropriate, impaired social communication and the presence of stereotypic behavior. This disorder is hypothesized to result from cerebral dysfunction arising from a complex interaction between genetic, epigenetic and environmental factors. ASD should be suspected in children failing ASD specific screening tests, in the presence of red flags in social, language and/or play domains, in children with developmental or language delay, abnormal behavior, poor school performance or in those who are at high risk. Comprehensive assessment comprises of a step-wise approach that includes taking a detailed history, performing a holistic examination and observing the child closely in relation to play, social interaction and behavior. Diagnosis is established by application of the diagnostic criteria for ASD of the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM V). The degree of severity, intellectual and language impairment and presence of other illnesses should be specified. Functional assessment identifies an individual's strengths and weaknesses. All these are important to formulate a customized intervention plan along with the family. The goal is to build up skills enabling optimal and as far as possible normal functioning while simultaneously reducing maladaptive behavior. This is achieved by a multi-disciplinary team comprising of various personnel experienced in tackling issues in ASD related to their respective areas of expertise. Intervention is primarily non-pharmacological, based on behavioral modification strategies. Drugs are only indicated in the reduction of target

symptoms refractory to behavioral intervention. Although there is no cure, timely and appropriate intervention can improve the quality of life significantly.

Keywords Autism spectrum disorder · Pervasive developmental disorder · Developmental and speech delay

Introduction

Autism Spectrum Disorder (ASD) is a neuro-developmental disorder of children, characterized by a specific behavioral phenotype of impaired social communication and stereotypic behavior. Once considered uncommon, it is now recognized that 1% of the population worldwide has ASD [1]. In America, the prevalence is 1 per 88 children [2]. There is paucity of data from the developing countries. The single community based Indian study reports a prevalence of 0.8–1.3% in 2- to 9-y-olds [3]. An apparently increasing trend in incidence has been noted, probably due to enhanced awareness and greater detection. Since parents usually bring their concerns related to development and behavior to the pediatricians and general practitioners, it is essential that medical professionals learn how to recognize such children and familiarize themselves with their management.

Historical Background

'Autism' originates from the Greek word 'autos' meaning self. Although Leo Kanner described the classical behaviors in 1943, it wasn't until 1980 that the disorder was included as a separate entity in the 'Diagnostic and Statistical Manual of Mental Disorders, 3rd edition' (DSM III). Since then nomenclature and diagnostic criteria have undergone many changes. The most recent was in 2013, when the existing term

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'Pervasive developmental disorder' was changed to ASD in DSM 5 along with diagnostic criteria.

Etiopathogenesis

Although still uncertain, the most accepted hypothesis of causation is the interplay of multiple factors; genetic, epigenetic and environmental [4]. These are thought to lead to neurotransmitter imbalance, dysfunctional neuronal pathways, and abnormal synaptogenesis and neuronal connectivity. Up to 20% individuals with ASD have identifiable genetic abnormalities. Strong associations are found with some genetic and metabolic disorders (Angelman's, Prader-Willi, Fragile X and Smith-Lemli-Opitz syndromes) and environmental causes (congenital rubella, antenatal intake of valproate and encephalitis). Till date no association has been found with any vaccine. It has been hypothesized that the reason why ASD is four-fold more common in boys is due to the presence of 'protective factors' in the female brain that makes it less vulnerable despite genetic susceptibility and an adverse environment.

Clinical Manifestations

As the name suggests the manifestations of ASD are in a continuum or spectrum. There is considerable variability in core symptoms, onset, presentation, severity and extent of disability which range from subtle to overt. Features should be interpreted by developmental age rather than chronological age.

Presenting Complaints

Children start appearing symptomatic by 18 to 24 mo when societal situations start to challenge their limitations in social communication. Concerns vary according to the age at which parents start noticing deviancies. Young children are brought with problems related to delay or regression in development and/ or speech, or age inappropriate play and/or behavior. Older children present with difficulties in academics, social awkwardness or behaviors serious enough to disrupt family life. In the latter in-depth questioning usually reveals subtle earlier indicators that were overlooked because there was apparently normal development and even appeared extra sharp due to their extreme independence, quick grasp of mechanics and keen observation. This is quite common as parents tend to rate development by acquisition of motor and language milestones while disregarding deviancies in social skills and behavior.

Core Abnormalities in Behavior

1) *Deficits in Social Interaction*

- Absent, preferential or inconsistent social smile.
- Decreased or absent non-verbal behaviors (eye-to-eye contact, facial expressions, and body language).
- Inappropriate response to social overtures: aloofness, excessive shyness or fussiness if interaction is forced. Persistent attempts are required to gain attention.
- Inability to initiate a social encounter properly, resulting in social awkwardness and even inappropriate touching, stroking, pushing or hitting others (the former mistaken for extreme friendliness and the latter for aggression).
- Limited sharing of enjoyment with others and difficulties in making friends.
- Abnormal attachment to caregivers: indifference or excessive clinginess.
- Excessive familiarity, absence of social inhibitions and stranger anxiety.

2) *Deficits in Communication*: Meaningful speech does not develop in 30–50% cases. If it does, language is delayed or deviant.

a) Verbal communication

- Children may only exhibit abnormal sounds, persistent jargon (meaningless speech), echolalia (repetition of words or phrases) or neologisms (substitution of words with meaningless sounds). These are considered persistent if seen beyond 3 y.
- Inability to initiate or maintain conversations.
- Difficulty in comprehending sarcasm, jokes or indirect speech.
- Excessive questioning or talking only about restricted topics.

b) Non-verbal communication

- Inability to understand, respond appropriately or use gestures or facial expressions.
- Absence of or decreased pointing (either for expressing desire or sharing interest). They may keep crying without pointing or go to great extents to obtain something in order to avoid asking for assistance. They may use the whole hand or drag another person by their hand to indicate something.

3) *Unusual Stereotypic Behavior*: The frequency, severity, repetitiveness and intensity of these and the distress caused on being stopped are important to note.

- Repetitive movements: rocking (back and forth or side-to-side), twirling on the spot, going around in circles, head shaking, finger movements, hand flapping, spinning or banging of objects.

- Preoccupation with unusual and restricted ideas or objects
 - Apparently inflexible adherence to specific, nonfunctional routines or rituals (*e.g.*, following a specific route, eating from a particular plate, not urinating anywhere except their bathroom at home).
- 4) *Deviant (Increased or Decreased) Sensory Perception*: These children often have dysfunctional sensory processing in their brains that result in difficulties in regulating responses to sensory stimuli (hypersensitivity or hyposensitivity).
- Visual: Poor eye contact, looking at objects from an angle or very closely, staring into space, avid interest in reflective surfaces, shadows or lights.
 - Auditory: Absent or delayed response to sounds or covering ears in distress to loud sounds heard daily (generator, door bell, pressure cooker whistle).
 - Olfactory: Preoccupation with smelling objects or food.
 - Tactile: Refusal to eat specific food or wear clothes of specific textures, compulsive touching, stroking or mouthing, diminished or exaggerated reactions/responses to pain.
- 5) *Miscellaneous*
- a) Unusual play and object use: Play may be mechanical, repetitive or atypical for age, without any spontaneity or change that is expected to evolve with age.
- Absent or minimal interest in toys. If present, restricted to mouthing, spinning or banging, playing with a part (spinning the wheels of a car) or arranging them in lines.
 - Persistent and repetitive play with unusual objects *e.g.*, keys, stones, string, *etc.*
 - Strong attachment to inanimate objects and insistence on keeping them in their hands.
 - Minimal interest in other children or preferential play with younger or older ones.
 - Minimal imaginative play: If present, minimal change is displayed.
- b) Abnormal emotional responses: The type and intensity may be inappropriate to the situation, like crying or laughing, grimacing, smiling or becoming angry or rigid without apparent reason.
- c) Challenging behaviors: These include
- Extreme passivity (unconcern about personal needs) or extreme hyperactivity
 - Inability to recognize danger to self or hazards or excessive fear of harmless objects

- Severe, intense temper tantrums, self injurious behavior and aggression
- Difficulties in adjusting to any alteration in daily routine or transitioning from one activity to another

Co-morbid Conditions

It is not uncommon for children with ASD being brought for concerns related to co-morbid conditions. These include:

- 1) *Cognitive Impairment* [Global developmental delay (GDD) or Intellectual disability (ID)]: This has been reported in 50–70% individuals. The wide variability is due to difference in evaluation methods. Assessment should be done by tools that rely predominantly on non-verbal based skills.
- 2) *Epilepsy*: All types of seizures are seen in 25–30% with bimodal presentation (infancy and adolescence).
- 3) *Psychiatric Illnesses*: Attention Deficit Hyperactivity disorder, Depression, Anxiety and Obsessive-Compulsive disorders.
- 4) *Feeding Disturbances*: These include decreased chewing, poor food acceptance, extreme food selectivity, food aversion or meal time misbehavior.
- 5) *Gastrointestinal Illnesses*: Frequent vomiting, gastroesophageal reflux, recurrent diarrhea, chronic constipation and recurrent abdominal pain are common presenting complaints.
- 6) *Sleep Disturbances*: Difficulty in falling asleep, repeated nocturnal awakenings, unusual bedtime routines lead to increased daytime behavioral issues and parental stress.
- 7) *Dysmorphism*: This is observed in 18–20% individuals (syndromic or non-specific dysmorphic features).

Natural History of ASD

ASD is a chronic illness with core features persisting throughout life, although symptoms change with age, maturity, environmental demands, experience and intervention. The more severely affected children present during infancy. The majority commonly present with delay and sometimes with regression in development and language, which gets noticed in the second or third year of life. Delays are not always truly cognitive as the inability to perform a skill may be due lack of interest (intrinsic to the nature of ASD) and opportunity (it is easier and less stressful for the caregiver to do the task rather than struggle with the child to do it) rather than lack of capability. A subset of children have normal or above-average intelligence ('high functioning') or may even be exceptionally gifted in specific areas, despite being impaired in others ('savant'). These children usually present later as they appear otherwise intelligent. As the child becomes older, he/she may

become more willing to socially interact but will face difficulties leading to frustration, anxiety and depression. During adolescence hyperactivity may improve and ritualistic behaviors decrease, but other psychiatric illnesses may develop.

Screening for ASD

Developmental screening is the practice of using validated and structured scales in all ‘apparently normally developing’ children. The American Academy of Pediatrics recommends universal developmental screening and surveillance that includes ASD specific screening at 18 and 24 or 30 mo [5]. Unfortunately these guidelines are not routinely followed by Indian clinicians. Instead they rely on an inferior method of looking for ‘red flags signs’ in young children (Table 1). These usually do not work for children with ASD except the more severely affected. ASD specific screening can be done between 16 to 30 mo by the Modified Checklist for Autism in Toddlers, revised with follow up (MCHAT-R/F). It is freely downloadable and the scoring and interpretation is easy [6]. Children are categorized as low risk of having ASD (not requiring further evaluation), medium risk (warranting re-evaluation after a month with in-depth evaluation if still positive) and high risk (immediate evaluation). Even if medical professionals are unable to recognize ASD they should definitely know how to

Table 1 ‘Red flags’ for Autism Spectrum Disorder in 12- to 18-mo-old children

Domain	Characteristic features
Social communication	<ul style="list-style-type: none"> • Regression or loss of social-emotional connectedness • Reduced or atypical character of any of the following <ul style="list-style-type: none"> - Eye gaze and shared or joint attention - Sharing of positive (more impaired) or negative emotions - Social or reciprocal smiling - Orienting when his or her name is called - Poor eye contact, or decreased use or understanding of facial expressions and gestures
Language	<ul style="list-style-type: none"> • Regression or loss of speech • Delayed or atypical character of any of the following <ul style="list-style-type: none"> - Babbling, particularly reciprocal vocalization (back-and-forth) - Language comprehension and use - Development of gestures (<i>e.g.</i>, pointing, waving)
Play	<ul style="list-style-type: none"> • Minimal interest in age appropriate toys • Unusual manipulation or repetitive banging or spinning of objects • Reduced interest in lap games like peek-a-boo or pat-a-cake

screen all children they come in contact with so that the early detection and timely intervention can be achieved.

Clinical Assessment

This should be done in children screening positive on MCHAT-R/F, with red flag signs, brought with parental concerns regarding development, speech or behavior, suspected to have ASD by a clinician or with siblings diagnosed with ASD or illnesses known to have strong associations with ASD. The goals are establishing diagnosis, assessing severity, determining level of functioning, and identifying co-morbid conditions. This can be done in a systematic manner.

Step 1: History taking

- i) Presenting complaints and parental concerns
- ii) Symptoms of any co-morbid condition
- iii) Significant antenatal, birth, neonatal and past history
- iv) Acquisition of developmental milestones in all domains
- v) Significant family history
- vi) Socio-economic history

Step 2: Examination: This aims at detecting signs of ASD, confirming developmental status and finding etiological indicators.

- i) Anthropometry and examination: microcephaly, macrocephaly, short stature, dysmorphic features, neurocutaneous markers
- ii) Clinical and developmental assessment

Step 3: Observation: Play, behavior, interaction, speech and gestures

Step 4: Determination of developmental profile: Determine if the delay is in ≥ 2 domains and whether equally affected *i.e.*, Global developmental delay (GDD), or unequally (more in social and language), or if isolated speech or social domains are affected.

Step 5: Establishing diagnosis: This is based on behavioral phenotype rather than etiology. All the diagnostic criteria of DSM V for ASD need to be satisfied (Table 2) [1]. For a multi-axial diagnosis the presence of the following need to be specified:

1. Severity: according to defined DSM V criteria
2. Any intellectual impairment
3. Any language impairment
4. Any medical, genetic or environmental factor
5. Any neurodevelopmental, mental or behavioral disorder
6. Any catatonia

Table 2 Diagnostic criteria for Autism Spectrum Disorder of DSM V [2]

- A. Persistent deficits in social communication and social interaction across multiple contexts not accounted for by general developmental delay as manifest by all (A1, A2, A3)*
- A1. Deficits in social-emotional reciprocity: ranging from abnormal social approach, failure to converse, reduced sharing of interests, emotions or affect, to total lack of initiation of SI.
- A2. Deficits in NV communicative behaviors used for SI ranging from poorly integrated verbal and NV communication, abnormal eye contact and body-language, deficits in understanding and use of NV communication to total lack of facial expression and gestures.
- A3. Deficits in developing and maintaining relationships beyond those with caregivers: ranging from difficulties adjusting behavior to suit social contexts, difficulties in sharing imaginative play and in making friends to apparent absence of interest in others.
- B. Restricted, repetitive patterns of behavior, interests or activities as manifested by at least 2 out of 4 symptoms* (B1, B2, B3, B4)
- B1. Stereotyped or repetitive speech motor movements or use of objects: like simple motor stereotypies, repetitive use of objects, echolalia or idiosyncratic phrases.
- B2. Excessive adherence to routines, ritualized patterns of verbal or NV behavior or excessive resistance to change: includes extreme distress at small changes, difficulties with transitions, rigid thinking patterns, greeting rituals, insistence on sameness, inflexible.
- B3. Highly restricted, fixated interests that are abnormal in intensity or focus: strong attachment to or preoccupation with unusual objects, excessively circumscribed or perseverative interests.
- B4. Hyper- or hypo-reactivity to sensory input or unusual interest in sensory aspects of environment: apparent indifference to pain/temperature, adverse response to specific sounds or textures, excessive smelling or touching of objects, visual fascination with lights or movement.
- C. Symptoms must be present in early childhood (but may not manifest until social demands exceed limited capacities).
- D. The symptoms cause clinically significant impairment in social, occupational or other important areas of functioning.
- E. These disturbances are not better explained by GDD or intellectual disability.

*Though several examples of criteria A and B are given, it is not exhaustive

GDD Global developmental delay; NV Non-verbal; SI Social interaction

- Step 6: Evaluation of co-morbid illnesses: ASD is often associated with other problems that can be as incapacitating as the primary illness. These need to be actively looked for and managed.
- Step 7: Synthesis: Arriving at a holistic diagnosis. It is well established that most children diagnosed as ASD at ≥ 24 mo of age retain their diagnosis lifelong.
- Step 8: Referral: For in-depth comprehensive evaluation.

Differential Diagnoses

- 1) *Attention Deficit Hyperactivity Disorder*: This is the most common misdiagnosis made. Hyperactivity is merely a

symptom that is not pathognomic of ADHD. Inattention, hyperactivity and impulsivity are present in ADHD but intellect, communication, play and social skills are normal.

- 2) *Social Communication Disorder*: Difficulties in social communication result in functional limitation, but repetitive behaviors or deviant sensory responses are absent.
- 3) *GDD/ Intellectual Disability*: The level of impairment will be equal in all domains and appropriate for the developmental age.
- 4) *Unidentified hearing impairment*: Despite speech delay which is compensated for by gestures, other domains will be normal.

Planning Investigations

ASD is a clinical diagnosis that lacks any confirmatory laboratory test. The purpose of investigations is to look for associated sensory problems like hearing and visual impairment that may remain unrecognized, detect preventable causes of delay (hypothyroidism) and actively look for the co-morbid conditions (Table 3). All boys with ASD require testing for Fragile X syndrome. If a child is dysmorphic or a genetic/metabolic condition is suspected, targeted tests are planned accordingly [4, 7, 8].

Management

The goals of management are to build cognitive, communication and social skills, promote learning and problem solving, reduce maladaptive behavior, treat co-morbid conditions, counsel parents, consider educational placement, prepare individuals and families for adolescence and adulthood and provide coping assistance to families (Fig. 1). Individualized management should be planned by a multi-disciplinary team comprising of:

- 1) *Clinician* (experienced pediatrician, general practitioner or psychiatrist) - for holistic evaluation and pharmacotherapy, if indicated
- 2) *Developmental pediatrician or clinical psychologist*- for evaluation of:
 - i) Core symptoms: Autism Diagnosis Interview-Revised (ADI-R) and Autism Diagnosis Observation Schedule General (ADOS-G) are internationally recommended tools. However both are not routinely used in India due to expense and lack of specialized training providers. The Childhood Autism Rating Scale (CARS) is popularly used for assessment of severity. Two Indian tools have recently been developed for diagnostic purposes that require further evaluation. These are the INCLEN: ASD Consensus Clinical Criteria and Indian Scale for

Table 3 Recommended investigations with indications in Autism Spectrum Disorder

Routine tests in all cases	Visual and refractory assessment Hearing assessment- Brainstem Evoked response Audiometry (BERA) Thyroid function test
For co-morbid conditions	Sleeping EEG: Seizures/ epilepsy, regression of milestones, poor sleep or loss of normal previously acquired sleep pattern GERD: 24 h pH monitoring Sleep studies: significant sleep impairment refractory to behavioral intervention therapy Lead studies: significant pica or living in high-risk environment
MRI brain	In epilepsy, regression, dysmorphic, suspected neuro-cutaneous disorder, focal neurological deficits, or microcephaly

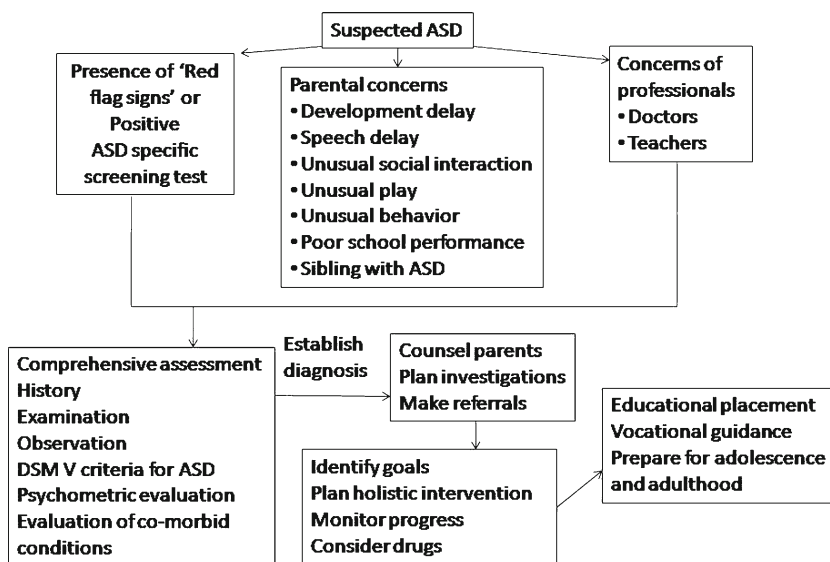
EEG Electroencephalogram; GERD Gastro esophageal reflux disease; MRI Magnetic resonance imaging

- Assessment of Autism [9, 10]. The performance of both of these is yet to be well established in children [11].
- ii) Cognitive function: Tools that assess verbal and non-verbal skills separately should be used to accurately assess cognitive capacity (i.e., Mullen’s scale and Leiter’s scale).
- iii) Adaptive function: The Vineland Adaptive Behavior Scale (second edition) rates the frequency and quality of various skills that are actually seen during activities of daily living (ADL). It is better than developmental scales that only measure whether a skill is present or not, irrespective of quality.
- 3) *Speech-language pathologist*- evaluates language, assists in feeding issues and provides speech therapy or alternative means to communicate.
- 4) *Pediatric neurologist/geneticist* - if warranted
- 5) *Occupational therapist* - develops skill based training for ADL and also provides Sensory Integration (SI) therapy,

- when warranted (predominant sensory issues present). SI provides controlled sensory inputs during play activities that are intended to change the way the child reacts to touch, sound, sight and movement.
- 6) *Behavior analyst* - for behavioral modification therapy
- 7) *Special educator* - for formulating an Individualized Educational Plan and deciding on educational placement (special, integrated/inclusive or normal school).
- 8) *Child and adolescent psychiatrist*
- 9) *Psychiatric social worker* - for providing family support

Unfortunately there are very few multi-disciplinary centers where all these services are available in India. There is paucity of trained and experienced personnel capable of provide high quality intervention. Referrals should be made to professionals who are qualified and experienced in working with children with ASD. Sometimes experts have to do multi-tasking.

Fig. 1 Algorithmic approach to management of a child with suspected Autism Spectrum Disorder



Planning Intervention

Individualized plans that suit the strengths and weaknesses of the affected child, the learning situation and the family environment should be considered [12, 13].

For Young Children: Behavioral modification and teaching strategies have been merged into developmental models so that spontaneous communication, socialization and play are learnt. Maximal benefit is seen when intervention is intensive (15 to 25 h per wk), home-based, and incorporated into the daily routine with the parents assuming the main role after training. Learned skills are gradually generalized from the home to the community. A popular example is the Early Start Denver Model. Early intervention leads to marked improvements in social communication skills, imitation and cognitive and adaptive function.

For Older Children: Most international educational intervention programs are based on Applied Behavior Analysis (ABA) which focuses on reducing significant maladaptive behaviors and developing appropriate skills required for social functioning, communication and gaining independence in ADL. ABA focuses on analyzing behavior, designing and implementing strategies that modify the environment (primarily parental responses) with the intent of producing meaningful changes in behavior [14].

An objective assessment of the target behavior is performed by obtaining descriptions from multiple sources to understand the underlying reason (like avoiding a task, getting a desired object, seeking attention, *etc*). It is believed that a behavior is shaped by the immediately preceding event or the event that immediately follows, the Antecedent-Behavior-Consequence (ABC) principle. This analysis links the identified reason to an appropriate strategy. Once the target behaviors are identified treatment goals are established in accord with the family. The focus is to establish small changes in behavior that gradually evolve into larger, more significant changes. This principle of ‘Discrete trial training’ is used to teach skills (attention, compliance, *etc*) as small, individually acquired tasks. Caregivers are trained in intervention with emphasis on consistency of response across settings. Substantial improvement in intelligence, language, adaptive behavior, academic performance and better social behavior is reported. The ‘Floor-time model’ is a play based intervention in which adults play with children on the floor with the goal of achieving social and emotional milestones. Substantial functional improvement has been reported when practiced for 15 h a wk over 8–12 mo. Training and education of autistic and related communication handicapped children (TEACCH) is a structured teaching method involving organizing the environment, predictable sequences, visual schedules, flexible routines and structured activities.

Though there are numerous approaches and educational techniques that are being used globally, the ground reality in

India is that there is dearth of trained personnel capable of delivering high quality therapy. Services are expensive and not easily accessible even in cities. Ultimately, selection of an intervention depends on accessibility, logistics, distances, cost and convenience. Culturally appropriate home-based low-cost intervention programs have been developed in some centers which should become available in the public domain soon.

Role of Medication

There is no cure for ASD. However, a number of drugs are available that significantly improve challenging behaviors that prove refractory to behavior modification or when they endanger the child. Atypical antipsychotics like ‘risperidone’ and ‘aripiprazole’ may reduce aggression, irritability and self-injurious behavior in children older than 5 y, but require careful monitoring of adverse effects [8, 13]. Co-morbid conditions are treated as per standard care.

Prognosis

Good prognostic factors include absence of cognitive impairment, underlying genetic or metabolic disorder, early diagnosis and timely and appropriate intervention, upper socioeconomic strata and higher levels of parental education [15].

Parental Counseling

Multiple sessions are required to get parents to overcome denial, understand the disorder and attain acceptance so that they can plan for the future positively. Details of illness, management strategies, intervention programs, pharmacotherapy, educational placement, prognosis, preparation for the future, advocacy and benefits need to be discussed in depth. Resource material should be provided as a lot of inaccurate material is available on the net. Genetic counseling includes explaining the recurrence risk. When there is no identifiable etiology, recurrence risk is 10–19% in families with one affected child and 33% if \geq two are affected [16]. The use of pre-conceptual folate in women reportedly decreases the likelihood of ASD in progeny [17].

It is the clinician’s responsibility to make parents aware of existing advocacy and legislation related to ASD. ‘The National Trust for the Welfare of Persons with Autism, Cerebral Palsy, Mental Retardation and Multiple Disabilities Act’ is a statutory body of the Government of India [18]. Its main objectives are to enable and empower this group and to

facilitate realization of equal opportunities, protection of rights and full participation. It runs several schemes that include DISHA (for early intervention and school readiness), VIKAAS (a day care centre that teaches vocational skills), NIRAMAYA (health insurance), SAHYOGI (caregiver training) and GYAN PRABHA (educational support). A manual on inclusive education for children with ASD is in use in the Sarva Siksha Abhiyan.

To conclude, ASD is common in Indian children. Screening for ASD should be universally practiced in all young children. A high degree of suspicion must be kept in children with developmental or speech delay, problem behavior or poor school performance. Evaluating a child with suspected ASD is not difficult if a systematic approach is used. Early identification translates into timely intervention and better prognosis. It is important to build up a network of reliable and competent multi-disciplinary professionals for the management of affected children and their families. There is a strong need to improve quality service provision in India. Several Government schemes are in place. Compared to international standards of care we have a very long way to go.

Compliance with Ethical Standards

Conflict of Interest None.

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