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RESEARCH ARTICLE

UPDATE TO UPGRADE AUTISM: A REVIEW OF NEURODEVELOPMENTAL DISORDER

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ABSTRACT

Background: Autism is a complex neurodevelopmental disorder characterized by impaired communication, reciprocal social interaction and restricted repetitive or stereotyped behavior. Autism cases have been increased these days before previous, due to better and broadened diagnostic criteria's with increased awareness. There are recent research articles in the literature stating about the importance of early identification of the condition with long term outcomes avoiding psychological complications. There are various treatment modalities available in the present and past literature which is often confusing and contradictory leaving the patient in the state of confusion for the best treatment modalities. Out of all, Pediatric primary health care clinicians play a very vital role for both its early detection and the continuing management of children with autism. There for it is very essential for the clinicians to update and upgrade the knowledge about the condition so to cater best of the treatment at right time. This review article will discuss and emphasize more on the topic of updating and upgrading the Autism disorder.

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INTRODUCTION

Due to constant increase in the condition of Autism and its related condition in children, Autism has become the focus of intense research (Barbaresi *et al.,* 2005; William *et al.,* 2006; Stratton *et al.,* 2001). The primary health care pediatrician plays a vital role in detection and as well as management of children affected with autism, so upgrading the knowledge about it is must to offer best treatment modalities to patient. This article is a collection of information about Autism, starting from its epidemiology to its diagnostic methodologies.

Epidemiology

There have been various epidemiological studies conducted on autism since 1980 to 1990s reported with a prevalence rate of 4 to 10 thousand children, where it has totally boomed up to 30 to 50 per 10 thousand patients in recent studies (Wing and Potter, 2002; Fombonne *et al.,* 2001; Fombonne, 2003; Yeargin-Allsopp *et al.,* 2003; Bertrand *et al.,* 2001; Gernsbacher *et al.,* 2005), due to this sudden increase in the data, a decent concern has arisen in public in context to autism. (Wing and Potter, 2002; Fombonne *et al.,* 2001; Fombonne, 2003; Yeargin-Allsopp *et al.,* 2003; Bertrand *et al.,* 2001). Before going through the epidemiology of autism, understanding autism is must. Autism was first described in 1943, as a complex developmental disorder characterized by severe impairment in reciprocal social interaction and communication and by a pattern of repetitive or stereotyped behavior (Stratton *et al.,* 2001; American Psychiatric Association, 2000). The Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV, TR) have included Autism with broader category description as (PDDNOS) pervasive developmental disorders, along with pervasive developmental disorder, not otherwise specified. PDDNOS and Asperger's disorder are often collectively referred to as the autism spectrum disorders. Various diagnostic criteria's has been mentioned but the oldest and the most important indication to autism is failure to joint development (Kanner, 1943; Filipek *et al.,* 1999; Volkmar *et al.,* 2005). Recent studies conducted in United States have shown a sudden hike in the incidence of research identified autism with individual of 21 year old from 5 to 44.9 per 1 lakh from 1983 to 1997 respectively (Newschaffer *et al.,* 2005). These incidence and prevalence studies helped a lot in development of new diagnostic criteria's and also lead to development of immunizations for prevention, several of ways of diagnosis and various methods of methods treatment approaches which increased the awareness of this neurological disorders (Nelson, 2003). There are studies conducted in

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United Kingdom that reported that the hike in the rate of improvement in diagnosis, the resulted in uncertain diagnosis of autism rather than a true case (Smeeth *et al.,* 2014).

Role of Pediatrician in the identification of Autism

The real role in the identification of the disease is in the hand of pediatrician, as at the early age the children visit the primary pediatrician for health related concerns. Thus it becomes the most important responsibility of the pediatrician to learn the identification skills to judge this neurological developmental disorder which will be more effective intervention for children with autism in comparison to other disorders (Lipkin and Schertz, 1996). Generally, the role of pediatric clinicians is to ideally follows the guidelines for the diagnosis and management of ASD's in children and recommend the effective treatment (Kanner, 1943; American Academy of Pediatrics, 2006; American Academy of Pediatrics, 2007).There are various levels of treatment approaches on the arrival of the children to clinic. A Level 2 approach is recommended for screening and diagnosing autism when a child fails normal developmental screening (Baron-Cohen *et al.,* 1992; Baron-Cohen *et al.,* 2000; Berument *et al.,* 1999; Rutter *et al.,* 2003). Child who fails autism screening, there is referral for evaluation recommended to experienced clinician for further observation. There is also referral recommended (Osterling and Dawson, 1994; Mars *et al.,* 1998; Werner *et al.,* 2000).

- If the child fails to use gesture or babble till the age of 12 months
- If there is no verbal response by the age of 16 months, if there are no two word phrases by 24months.
- Loss of social and language skills.
- Failure in Joint attention in infants
- Mental retardation or other abnormal developments like loss of eye contact, improper orientation to name, unable to show or point fingers.
- Lack of pretend play and imitation, abnormal nonverbal communication, and disproportionate language delays differentiate autism from other developmental disorders at the toddler age group.

All these behavior including stereotyping motor mannerisms, behavioral outburst, atypical sensory do not differentiate with a proper marking between autism and other disorders in early developmental phase. There have been modification in the checklist for autism; one of them is M-CHAT: Modified Checklist for Autismin Toddlers, this is a specific screening tool developed for the age group of 24 month children (Baird *et al.,* 2000; Chouieri and Bridgemohan, 2005; Robins *et al.,* 2001). This list consists of twenty three points that is totally based upon parental report which justifies the efficiency of the checklist that is used effectively at primary health center. Pervasive Developmental Disorders Screening Test–II37 and the Screening Tool for Autism in Two-Year Olds have been also considered as a promising tool for autism for the age group 2 year old (Stone *et al.,* 2004). Child can also be identified with autism with the early developmental characteristic profile with weakness in language and visuomoter response (Lockyer and Rutter, 1970; Happe and Wechsler, 1994; Dennis *et al.,* 1999; Joseph *et al.,* 2002; Ehlers *et al.,* 1997; Klin *et al.,* 1995; Mayes and Calhoun, 2004 & 2003; Shah A, Frith, 1993; Voigt *et al.,* 2000). The child older than 4 years or more, questionnaire of social communication is used as a screening method (Berument *et al.,* 1999; Rutter *et al.,* 2003). The capture scales like Cognitive Adaptive Test/Clinical Linguistic and Auditory Milestone Scale also helps at primary health care in quantifying information in language and visuomoter problems solving (Accardo, 2005).

What are medical assessments needed for children with Autism

Medical assessment is very essential for the children with Autism. Following are the points which should be assessed:

- Audio logical assessment
- Lead screening until pica resolves (Lead toxicity is common in autism so evaluation should be done on lead level) (Shannon and Graef, 1997).
- Detailed history and physical examination which will guide diagnosis of medical workup (Gillberg C, Coleman, 1996; Challman *et al.,* 2003; Voigt *et al.,* 2000; Shevell *et al.,* 2001; Chudley *et al.,* 1998; Kielinen *et al,* 2004).
- Checkup for tuberous sclerosis.
- Wood's lamp examinations for identifying hypo pigmented associated macules (Curatolo *et al.,* 2004).
- Routine CT scan or MRI, due to studies stating abnormal brain growth patterns (Redcay and Courchesne, 2005).
- Checkup for other syndromes as many syndromes like de lange syndrome, angelman syndrome, down syndrome and more are associated with autism (Rapin, 1997; Cohen *et al.,* 2005).
- DNA testing for fragile X syndrome with high resolution chromosome analyses is recommended for children with congenital anomalies, mental retardation (Muhle *et al.,* 2004).
- Fluorescent in situ hybridization testing, if initial investigations produce negative results (Muhle *et al.,* 2004; Wassink *et al.,* 2004; Dykens *et al.,* 2004).
- Metabolic testing

Diagnostic Methods for Autism:

As autism shows wide clinical features, diagnosis of autism needs comprehensive and multidisciplinary approach for child's assessment for differentiating from other developmental disorder (Volkmar *et al.,* 2005; Lord *et al.,* 2001). As there are no specific diagnostic tests for autism, there is general follow of DSM-IV, TR criteria, this is the considered as Gold standard for the diagnosisdisorder (Volkmar *et al.,* 2005; Lord *et al.,* 2001). Students assessed at the early school by intervention staff can be excluded for this diagnostic assessment. The clinical diagnosis of an ASD is facilitated by the use of rating scales and direct assessment tools specifically developed for this purpose (Lord *et al.,* 1994; Schopler *et al.,* 1988). More than 60 percent of the children affected with autistic have cognitive skills in the mentally retarded range (Barbaresi *et al.,* 2005; Stratton *et al.,* 2001). Child with autism demonstrates solving skills, visual problems and fewer intelligence quotients with language problems ((Lockyer and Rutter, 1970; Happe and Wechsler, 1994; Dennis *et al.,* 1999; Joseph *et al.,* 2002; Ehlers *et al.,* 1997; Klin *et al.,* 1995; Mayes and Calhoun, 2004 & 2003; Shah A, Frith, 1993; Voigt *et al.,* 2000; Lord *et al.,* 2001). The

cognitive assessment should be concluded using instruments that have been demonstrated to be appropriate (Bayley, 1993; Mullen, 1997; Elliot, 1990; Thorndike *et al.,* 1986; Wechsler, 2003 & 1997; Roid and Miller, 1997; Stutsman, 1948). Often the affected child uses pragmatic language which mean avoided social use of language. A proper observation of the child is needed in the natural environment to judge the pragmatic language (Stratton *et al.,* 2001; Kanner, 1943; Volkmar *et al.,* 2005). Social-adaptive behavioral evaluations must include assessment of functional skills such as sleeping, eating, toileting and problem outburst behaviors and self-injury. The Vineland Adaptive Behavior Scales and the Scales of Independent Behavior are considered as potential formal questionnaires and rating scales to asses this (Sparrow *et al.,* 1984; Bruininks *et al.,* 1996).The most important is assessment of parental resources which will help provide the appropriate support to family.

Therapies for affected children:

There is no drug treatment approved by Food and Drug Administration for autism, especially for the communication and social interaction till date, although psychopharmacologic therapies are recommended for them (Aman *et al.,* 2004). Furthermore, when similar target behaviors are treated with psychotropic medications proves to be inefficient with adverse reactions. However, there are studies available in literature which states risperidone as a drug to control outburst behaviors and self-injury (McCracken *et al.,* 2002; Research Units on Pediatric Psychopharmacology, 2005). There are various other drug therapy which can be beneficial like selective serotonin reuptake inhibitors, 2-adrenergic agonists, but have shown insufficient result and hence more clinical trials are needed to prove more efficient result (DeLong *et al.,* 1998; Jaselskis *et al.,* 1992). Psychotropic medications must be avoided in isolation but utilized only in conjunction with behavioral, educational, and habilitative therapies (American Academy of Pediatrics, 2005). If psychotropic medications are chosen for the treatment, it should be used in a minimum dose with gradual increase till you find the positive outcome to avoid complications or adverse effect.

Conclusion

On completion of the review article on the update to upgrade autism, there is still a strong need of clinical trials to find effective medication therapy for the patients. There is also need of research towards finding new methods or criteria's, protocols for assessment of autism. In addition, there is more need of awareness for general practicing clinician to refer the child as soon as possible to avoid future complication.

REFERENCES

Accardo PJ, Capute AJ, eds. *The Capute Scales.* Baltimore, Md: Brookes Publishing Co; 2005.

Aman MG, Novotny S, Samango-Sprouse C, *et al*. Outcome measures for clinical drug trials in autism. *CNS Spectr*. 2004;9:36-47.

American Academy of Pediatrics, Committee on Children with Disabilities. The pediatrician's role in the diagnosis and management of autistic spectrum disorder in children. *Pediatrics*. 2001;107:1221-1226.

American Academy of Pediatrics, Committee on Children With Disabilities. Technical report: the pediatrician's role in diagnosis and management of autistic spectrum disorder in children. *Pediatrics*. 2001;107:1221-1226. http: //www. pediatrics.org/cgi/content/full/107/5/e85. Accessed October 1, 2005.

American Academy of Pediatrics, Council on Children with Disabilities. Identifying infants and young children with developmental disorders in the medical home: an algorithm for developmental surveillance and screening. *Pediatrics,* 2006;118:405-420.

American Psychiatric Association. *Diagnostic and Statistical Manual of MentalDisorders, Fourth Edition, Text Revision.* Washington, DC: American Psychiatric Association; 2000.

Baird G, Charman T, Baron-Cohen S, *et al*. A screening instrument for autism at 18 months of age: a 6-year follow-up study. *J AmAcad Child Adolesc Psychiatry*, 2000; 39:694-702.

Barbaresi WJ, Katusic SK, Colligan RC, Weaver AL, Jacobsen SJ. The incidence of autism in Olmsted County, Minnesota, 1976-1997: results from a population- based study. *Arch PediatrAdolesc Med*., 2005;159:37-44.

Baron-Cohen S, Allen J, Gillberg C. Can autism be detected at 18 months? The needle, the haystack, and the CHAT. *Br J Psychiatry*. 1992;161:839-843.

Baron-Cohen S, Wheelwright S, Cox A, *et al*. Early identification of autism by the Checklist for Autism in Toddlers (CHAT). *J R Soc Med*. 2000;93:521-525.

Bayley N. *Bayley Scale of Infant Development.* 2nd ed. San Antonio, Tex: Psychological Corp; 1993.

Bertrand J, Mars A, Boyle C, Bove F, Yeargin-Allsopp M, Decoufle P. Prevalence of autism in a United States population: the Brick Township, New Jersey, investigation. *Pediatrics*. 2001;108:1155-1161.

Berument SK, Rutter M, Lord C, Pickles A, Bailey A. Autism screening questionnaire:diagnostic validity. *Br J Psychiatry*. 1999;175:444-451.

Bruininks R, Woodcock R, Weatherman R, Hill B. *Scales of Independent Behavior–Revised (SIB-R)*. Chicago, Ill: Riverside Publishing Co; 1996.

Challman TD, Barbaresi WJ, Katusic SK, Weaver A. The yield of the medical evaluation of children with pervasive developmental disorders. *J Autism DevDisord*. 2003;33:187-192.

Chouieri R, Bridgemohan C. To make the biggest difference, screen early for autism spectrum disorders. *Contemp Pediatr*. 2005;22:54-64.

Chudley AE, Gutierrez E, Jocelyn LJ, Chodirker BN. Outcomes of genetic evaluation in children with pervasive developmental disorder. *J DevBehavPediatr* 1998;19:321-325.

Cohen D, Pichard N, Tordjman S, *et al*. Specific genetic disorders and autism: clinical contribution towards their identification. *J Autism DevDisord*. 2005; 35:103-116.

Curatolo P, Porfirio MC, Manzi B, Seri S. Autism in tuberous sclerosis. *Eur JPaediatr Neurol*. 2004;8:327-332.

DeLong GR, Teague LA, McSwain Kamran M. Effects of fluoxetine treatment inyoung children with idiopathic autism. *Dev Med Child Neurol*. 1998;40:551-562.

Dennis M, Lockyer L, Lazenby AL, Donnelly RE, Wilkinson M, Schoonheyt W. Intelligence patterns among children with high-functioning autism, phenylketonuria, and childhood head injury. *J Autism DevDisord*. 1999;29:5-17.

Dykens EM, Sutcliffe JS, Levitt P. Autism and 15Q11-Q13 disorders: behavioral, genetic, and pathophysiological issues. *Ment Retard DevDisabil Res Rev*. 2004;10:284-291.

Ehlers S, Nyden A, Gillberg C, *et al*. Asperger syndrome, autism, and attentiondisorders: a comparative study of the cognitive profiles of 120 children. *J Child Psychol Psychiatry*. 1997;38:207-217.

Elliot C. *Differential Abilities Scale (DAS).* New York, NY: Psychological Corp; 1990.

Filipek PA, Accardo PJ, Baranek GT, *et al*. The screening and diagnosis of autistic spectrum disorders [published correction appears in *J Autism DevDisord*. 2000;30:81]. *J Autism DevDisord*. 1999;29:439-484.

Fombonne E, Simmons H, Ford T, Meltzer H, Goodman R. Prevalence of pervasive developmental disorder in the British nationwide survey of child mental health. *J Am Acad Child Adolesc Psychiatry*. 2001;40:820-827.

Fombonne E. The prevalence of autism. *JAMA*. 2003;289:87-89.

Gernsbacher M, Dawson M, Goldsmith H. Three reasons not to believe in an autism epidemic. *CurrDirPsychol Sci*. 2005;14:55-58.

Gillberg C, Coleman M. Autism and medical disorders: a review of the literature. *Dev Med Child Neurol*. 1996;38:191-202.

Happe FGE. Wechsler IQ profile and theory of mind in autism: a research note. *J Child Psychol Psychiatry*. 1994;35:1461-1471.

Jaselskis CA, Cook EH Jr, Fletcher KE, Leventhal BL. Clonidine treatment of hyperactive and impulsive children with autistic disorder. *J ClinPsychopharmacol,* 1992; 12:322-327.

Joseph RM, Tager-Flusberg H, Lord C. Cognitive profiles and social communicative functioning in children with autism spectrum disorder. *J Child Psychol Psychiatry*. 2002; 43:807-821.

Kanner L. Autistic disturbances of affective contact. *Nervous Child*. 1943;2:217- 250.

Kielinen M, Rantala H, Timonen E, Linna SL, Moilanen I. Associated medical disorders and disabilities in children with autistic disorder: a population-based study. *Autism*. 2004;8:49-60.

Klin A, Volkmar FR, Sparrow SS, Cicchetti DV, Rourke BP. Validity and neuropsychological characterization of Asperger syndrome: convergence with nonverbal learning disabilities syndrome. *J Child Psychol Psychiatry*. 1995;36: 1127-1140.

Lipkin PH, Schertz M. An assessment of the efficacy of early intervention programs. In: Capute AJ, Accardo PJ, eds. *Developmental Disabilities in Infancy and Childhood* 2nd ed. Baltimore, Md: Brookes Publishing Co; 1996:525-547.

Lockyer L, Rutter M. A five- to fifteen-year follow-up study of infantile psychosis, IV: Patterns of cognitive ability. *Br J SocClin Psychol*. 1970;9:152-163.

Lord C, McGee JP, eds, for the Committee on Educational Interventions for Children with Autism, Division of Behavioral and Social Sciences and Education, National Research Council. *Educating Children With Autism.* Washington, DC: National Academy Press; 2001.

Lord C, Rutter M, Le Couteur A. Autism Diagnostic Interview–Revised: a revised version of a diagnostic interview for caregivers of individuals with possible pervasive developmental disorders. *J Autism DevDisord*. 1994;24: 659-685.

Mars AE, Mauk JE, Dowrick P. Symptoms of pervasive developmental disorders as observed in prediagnostic home videos of infants and toddlers. *J Pediatr*. 1998;132:500-504.

Mayes SD, Calhoun SL. Ability profiles in children with autism: influence of age and IQ. *Autism*. 2003;7:65-80.

Mayes SD, Calhoun SL. Analysis of WISC-II, Stanford–Binet IV, and academic achievement test scores in children with autism. *J Autism DevDisord*. 2003; 33:329-341.

Mayes SD, Calhoun SL. Similarities and differences in Wechsler intelligence Scale for Children, third edition (WISC-III) profiles: support for subtest analysis in clinical referrals. *ClinNeuropsychol*. 2004;18:559-572.

McCracken JT, McGough J, Shah B, *et al*; Research Units on Pediatric Psychopharmacology Autism Network. Risperidone in children with autism and serious behavioral problems. *N Engl J Med*. 2002;347:314-321.

Muhle R, Trentacoste SV, RapinI. The genetics of autism. *Pediatrics*. 2004;113: e472-e486.

Mullen E. *Mullen Scales of Early Learning.* Los Angeles, Calif: Western Psychological Services; 1997.

Nelson KB, Bauman ML. Thimerosal and autism? *Pediatrics*. 2003;111:674-679.

Newschaffer CJ, Falb MD, Gurney JG. National autism prevalence trends from United States special education data. *Pediatrics*. 2005;115:e277-e282.

Osterling J, Dawson G. Early recognition of children with autism: a study of first birthday home videotapes. *J Autism DevDisord*. 1994;24:247-257.

Rapin I. Autism. *N Engl J Med*. 1997;337:97-104.

Redcay E, Courchesne E. When is the brain enlarged in autism? ametaanalysis of all brain size reports. *Biol Psychiatry*. 2005;58:1-9.

Research Units on Pediatric Psychopharmacology (RUPP) Autism Network. Randomized, controlled, crossover trial of methylphenidate in pervasive developmental disorders with hyperactivity. *Arch Gen Psychiatry*. 2005;62:1266-

Robins DL, Fein D, Barton ML, Green JA. The modified checklist for autism in toddlers: an initial study investigating the early detection of autism and pervasive developmental disorders. *J Autism DevDisord*. 2001; 31:131-144.

Roid G, Miller L. *Leiter International Performance Scale-Revised.* Wood Dale,Ill: Stoelting Co; 1997.

Rutter M, Bailey A, Lord C. *SCQ: Social Communication Questionnaire.* Los Angeles,Calif: Western Psychological Services; 2003.

Schopler E, Reichler R, Rochen-Renner B. *The Childhood Autism Rating Scale(CARS).* Los Angeles, Calif: Western Psychological Services; 1988.

Shah A, Frith U. Why do autistic individuals show superior performance on the block design task? *J Child Psychol Psychiatry*. 1993;34:1351-1364.

Shannon M, Graef J. Lead intoxication in children with pervasive developmental disorders. *J ToxicolClinToxicol*. 1997;34:177-182.

Shevell MI, Majnemer A, Rosenbaum P, Abrahamowicz M. Etiologic yield of autistic spectrum disorder: a prospective study. *J Child Neurol*. 2001;16: 509-512.

Smeeth L, Cook C, Fombonne PE, *et al*. Rate of first recorded diagnosis of autism and other pervasive developmental disorders in United Kingdom general practice, 1988 to 2001. *BMC Med*. 2004;2:39.

Sparrow S, Balla D, Cicchetti D. *Vineland Adaptive Behavior Scales, ExpandedEdition.* Circle Pines, Minn: American Guidance Service; 1984.

Stone WL, Coonrod EE, Turner LM, Pozdol SL. Psychometric properties of the STAT for early autism screening. *J Autism DevDisord*. 2004;34:691-701.

Stratton K, Gable A, Shetty P, McCormich M, eds. *Immunization Safety Review: Measles-Mumps-Rubella Vaccine and Autism.* Washington, DC: National Academy Press; 2001.

Stutsman R. *The Merrill-Palmer Scale of Mental Tests.* Chicago, Ill: Stoelting Co; 1948.

Thorndike R, Hagen E, Sattler J. *The Stanford-Binet Intelligence Scale: Guidefor Administering and Scoring.* 4th ed. Chicago, Ill: Riverside Publishing Co; 1986.

Voigt RG, Childers DO, Dickerson CL, *et al*. Early pediatric neurodevelopmental profile of children with autistic spectrum disorders. *ClinPediatr (Phila)*. 2000; 39:663-668.

Voigt RG, Dickerson CL, Reynolds AM, Childers DO, Rodriguez DL, Brown FR.\ Laboratory evaluation of children with autistic spectrum disorders: a guide for primary care pediatricians. *ClinPediatr (Phila)*. 2000;39:669-671.

Volkmar F, Chawarska K, Klin A. Autism in infancy and early childhood. *AnnuRev Psychol*. 2005;56:315-336.

Wechsler D. *Wechsler Adult Intelligence Scale* . 3rd ed. San Antonio, Tex: Psychological Corp; 1997.

Wassink TH, Brzustowicz LM, Bartlett CW, Szatmari P. The search for autism disease genes. *Ment Retard DevDisabil Res Rev*. 2004;10:272-283.

Wechsler D. *Wechsler Intelligence Scale for Children.* 4th ed. San Antonio, Tex: Psychological Corp; 2003

Werner E, Dawson G, Osterling J, Dinno N. Brief report: recognition of autism spectrum disorder before one year of age: a retrospective study based on home videotapes. *J Autism DevDisord*. 2000;30:157-162.

William J. Barbaresi, MD; Slavica K. Katusic, MD; Robert G. Voigt, MD, A Review of the State of the Science for Pediatric Primary Health Care Clinicians Arch PediatrAdolesc Med. 2006;160:1167-1175.

Wing L, Potter D. The epidemiology of autistic spectrum disorders: is the prevalence rising? *Mental Retard Dev Dis Res Rev*. 2002;8:151-161.

Yeargin-Allsopp M, Rice C, Karapurkar T, Doernberg N, Boyle C, Murphy C. Prevalence of autism in a US metropolitan area. *JAMA*. 2003;289:49-55.

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