

Autism – Evaluation and Treatment

The LADDERS Model



Margaret L. Bauman, MD
Boston University School of Medicine
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Pervasive Developmental Disorders- DSM IV (1994)

- Autism
- Asperger's Syndrome
- Rett Syndrome
- Childhood Disintegrative Disorder
- Pervasive Developmental Disorder - not otherwise specified.

DSM-V (2013)

- Asperger's syndrome removed as separate
- Asperger's syndrome now subsumed under the Autism Spectrum Disorders (ASDs)
- ASD categorized as mild, moderate, severe.
- New category of Social Pragmatic Disorder.
- How might this change impact service provision and clinical research going forward?

Core features of Autism

- Impaired social interaction
- Delayed and disordered language
- Isolated areas of interest

Inconsistent Clinical Features

- Atypical prosody, intonation
- Echolalia, scripting, pronoun reversals
- Repetitive and stereotypic behavior
- Need for routine; difficulty with novelty
- Hypotonia, poor motor coordination
- Atypical information processing
- Sensory dysfunction

Infant Toddler Data-Baby Sibs Studies

- The socially serious baby
- Decreased social reciprocity
- Limited babbling/vocalization.
- No pointing for communication at 12 months
- Absent joint attention at 12 months
- Limited or absent imaginary play
- Visual gaze
- The presence of head lag at 6 months

Baby Autism Sibs data - cont.

- Atypical motor patterns
- Abnormal response to maternal “still face”.
- “Is this baby like the last one?”
- Earliest diagnosis now at 12-14 mos. Can we do better without a biomarker?
- Diagnostic “stability” said to be 30-34 mos. The time when a diagnosis can be certain.

Possible Etiologies

- Genetics/epigenetics
- Infection - bacterial/viral
- Environmental factors – dietary factors, toxins, endocrine disruptors, paternal age, prematurity, other.
- Immune/autoimmune factors.
- Current consensus - ASD is heterogeneous clinically, biologically and etiologically.

Neurological Assessments of the Child with Autism

1. Obtain a medical and developmental history
2. Neurological examination and behavioral observation
3. Consider need for additional studies:
 - a. Chromosomal/DNA analysis
 - b. Electroencephalogram (EEG)
 - c. Imaging studies (MRI, CT)
 - d. Metabolic (blood/urine) studies

What have we been missing?

- ASD classically defined on the basis of cognitive, behavioral, language and processing modalities.
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- But ASD may be more than a disorder of information processing, language and behavior.
- ASD children, adolescents and adults can and often do have medical issues that have largely gone unrecognized and unaddressed.

Disruptive Behaviors

- Atypical and/or disruptive behaviors of varying descriptions and severity have often been seen as just “part of the Autism”.
- But are they???

What is the definition of “behavior”?

- The manner in which an organism behaves in reaction to social stimuli or inner need.
- Observable activity in response to an external or internal stimulus.
- Anything that the organism does that involves action or response to stimulation.

What do we know?

- Research indicates that typically developing children often show elevated rates of problem behavior in association with physical illness.
- Physical illness is common in persons with developmental disabilities (DD).
- Studies have documented significantly higher rates of acute and chronic medical conditions in DD persons as compared to the general population.

What medical conditions have been documented?

- Problem behaviors have been linked to conditions such as constipation, allergies, premenstrual syndrome, ear infections and urinary tract infections.
- Plausible explanation relates to degree of pain or discomfort experienced by the individual at the time rather than to the physical illness per se.

Common Medical Conditions

- Seizures
- Sleep disorders
- Gastrointestinal dysfunction
- Metabolic disorders
- Anxiety
- Urinary tract disorders

Seizures

- Major motor seizures, complex partial seizures
- May difficult to diagnose
- EEG (Electroencephalogram)
- 24 – 48 hour EEG may be useful.
- Obtain a video of the event if possible

Sleep Disorders

- Trouble getting to sleep or staying asleep
- May be related to atypical sleep cycle
- Possible effect of Gastrointestinal Reflux
- Allergies
- Sensory Processing disorders

Gastrointestinal Disorders

- Limited diet
- Constipation, diarrhea
- Abdominal pain
- Cyclic vomiting
- Tight rectal sphincter

Clinical Signs of GI Disorders

- Gulping and facial grimacing
- Tapping on the chest or stomach
- Putting pressure on the abdomen
- Constant chewing on non-edible items - shirt sleeves, shirt neck lines, etc
- Frequent eating/drinking
- Any unexplained negative behavioral change, including aggression, self-injurious behavior, with or without GI symptoms.

Reason for Urology referral

- Previously continent child becomes incontinent
- Usually a preteen
- May be a “spastic bladder”
- Treatment with Ditropan may be helpful

“Red Flags” for Metabolic Work-up

- Poor physical endurance
- Late walking (i.e. 24 months)
- Repeated regressions after age 2 1/2 years
- Dysmorphic features
- Making poor progress despite excellent services
- Qualitatively “different”
- Involvement of multiple organ systems

Mitochondrial Disorders

- Weissman, et al., December 2008
- 25 patients with ASD
- All later determined to have enzyme or mutation-defined mitochondrial dysfunction.
- 21 subjects had non-neurological medical problems
- 19 subjects had constitutional symptoms, primarily excessive fatigue

Mitochondrial Disorders

- 32% - delayed motor milestones
- 40% - unusual patterns of regression
- 76% - abnormal levels of blood lactate
- 36% - abnormal levels of blood alanine
- 52% - abnormal levels liver function studies
- Most common electron transport chain disorders were Complex I (64%) and Complex III (20%)

Mitochondrial Disorders

- Although initially all subjects were identified as having Essential (Idiopathic) Autism, careful clinical and biochemical assessment identified features that differentiated them from children with Idiopathic Autism.
- This preliminary data suggests that a disturbance in mitochondrial energy production may underlie pathophysiologic mechanisms in a subset of ASD persons.

Psychopharmacology

- Approach to medication management
 - Rule out potential medical disorders first
 - Should never be first line of defense - should be used as an adjunct to other interventions.
 - Consider specific symptoms - depression, anxiety, OCD, impulsivity, ADHD, etc
 - Consider the risks and benefits of choosing and using any medication.

Psychopharmacology

- Family should find a psychopharmacologist with whom they are comfortable.
- Choice of medications may be influenced by training of provider
- Health care insurance may influence choice of medication.
- Consider medical risks, cost to the patient, potential invasive procedures (blood draws), tolerance of side effects, possible drug interactions and methods of administration.

Other medical conditions

- Obesity
- Osteoporosis
- Otitis media
- PANDAS
- LYME Disease
- Dental
- Injuries/fractures

The LADDERS Team – Why?

- Autism is a complex disorder – it's not just about the brain.
- All ASD individuals are not the same.
- What works for one may not work for another.
- Need to find the right intervention for each client
- Need many perspectives to determine and guide coordinated effective services for each patient.

Putting Together a Team – The LADDERS Model

- Neurology
- Child Psychiatry
- Developmental Pediatrics
- Internal Medicine
- Gastroenterology
- Neuropsychology
- Education Specialist

The LADDERS Model – cont.

- Social Worker
- Family Resource Coordinator
- Occupational Therapy
- Physical Therapy
- Speech and Language
- Audiology
- Clinical Manager

External Associated Services

- Dental
- Behavioral Psychology
- Orthopedics
- Endocrinology
- Medical Genetics
- ENT (Ear, Nose and Throat)
- Developmental Optometry/Ophthalmology

External Associated Services

- Sleep Disorders
- Nutrition/dietary management
- Urology/nephrology
- Assistive Technology
- Legal assistance
- Parent support groups
- 501C3 team

LADDERS approach

- Social worker – obtains reason for visit, sends out intake packet, schedules appointment with doctor.
- Doctor visit – confirm diagnosis, make referrals.
- Patient evaluated by referral providers.
- Reports from referrals sent to doctor and parents.
- Parents meet with doctor, review results of evaluations. Therapy & school plans started.

Advantages of Multiple Disciplines located at the same site

- 1) Disciplines learn from each other
- 2) Observations & approaches can be shared
- 3) Efficient consultation between disciplines
- 4) A one-stop “shop” for patients and families.
- 5) Reduces the risk of fragmented care.
- 6) Provides opportunity for interdisciplinary clinical research

The Autism Treatment Network (ATN)

Began in fall 2003. Modeled after LADDERS
multidisciplinary/interdisciplinary program

Originally consisted of five academic sites

– U. Wash (Seattle), Baylor, Columbia, OHSU, MGH

Involves multidisciplinary medical teams

Involves use of common protocols

Commitment to data sharing across/between sites

Why a consortium?

- Evaluate potential “red flags” - are they valid?
- Are there other “red flags” as yet to be identified?
- What proportion of ASD population affected?
- Accurate identification of medical disorders
- What interventions are most effective?
- Establish scientifically sound and meaningful standards of care

Where are we now?

- In January 2007 and again in 2013, Autism Speaks initiated a Request for Proposals - to expand the ATN initiative
 - As a result, there are now a total of 14 multidisciplinary medical sites associated with academic centers.
 - Sites are providing standard medical assessments and care for ASD persons, sharing protocols and submitting data into a common database. Medical studies can be funded by ATN and AIR-P.

ATN Sites -2014

- Alberta, CA
- Arkansas
- Cincinnati
- Denver
- LADDERS.LFAC
- Nationwide Childs
- Pittsburgh
- Toronto, CA
- U. Missouri, Columbia, MO
- U. Pennsylvania, Philadelphia
- U. Rochester, NY
- UC Irvine, California
- USC
- Vanderbilt

Goals of the ATN

- To establish evidence based data with regard to medically related conditions in ASD.
- To establish standards of health care for children, adolescents and adults on the spectrum.

Summary

Medical Co-morbidities are important

- Improve quality of life.
- Better health leads to better outcomes.
- Subsets of ASD persons may be more specifically identified - genetically and/or metabolically.
- Understanding associated medical conditions could enhance our understanding of the neurobiology of ASD.

Future Directions

- Efforts to identify diagnostic biomarkers
- Identification of ASD subgroups
- Expansion of use of assisted technology
- Explicit correlation between imaging and postmortem brain studies and clinical phenotypes
- Longitudinal studies in same population
What is the natural life history of the disorder?

Future Directions – cont.

- Correlations between genetics and clinical phenotypes. Differences in males vs females.
- Studies of the gastrointestinal and brain connections. Studies of the microbiome and enteric nervous system .
- Meaningful employment for ASD adults
- Studies of aging – where are the ASD seniors?

- THERE IS HOPE

- Early diagnosis and intervention result in improved outcomes.
- Some ASD children lose their diagnosis
- Rx for medical disorders results in better outcomes
- Identification of ASD subgroups
- Better availability of services
- Some symptoms improve with age (adults)

