Autism Spectrum Disorders

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ASD
• 1/110 (CDC, 2009)
• 4:1 boys to girls ratio (1 in 70 to 1 in 94 boys)
• Typically appears in first 3 yrs of life
• Areas affected:
  – Socialization (cognitive function, social anxiety)
  – Communication (use & form of language)
  – Behaviour

Areas of concern
• Communication & socialization
• Restricted interests
• Repetitive behaviours (stereotypies)
• “Stickiness”

Epidemic?
• Milder cases dx’ed
• Changes from DSM III to DSM IV
• Younger kids dx’ed
• More awareness by clinicians & parents
BUT…
Increase in prevalence still not explained by all of that!

Genetics
• 10%: FXS (15-33% w ASD), TSC, PKU, Rett
• 5 %: rare single gene
• 7%: rare chromosomal anomalies
• ?%: one or more common gene copy number variation (multiple copies of a gene)
• ?%: multiple gene involvement
• Eventually…microarray tests for all!

S. Scherer

Epigenetics
• New field of study (5-10 yrs)
• Genes activated or turned off (methylation)
• EVERYONE has some epigenetic errors
• Environmental triggers:
  – drugs,
  – toxins,
  – assistive reproductive technology (ASD 3-4X!)

S. Scherer
**Neuroinflammation**

- Activation of neuroglial cells
- Causes: pesticides, diesel fuel, heavy metals, air pollution, autoimmune response to something?
- Oxidative stress from free radicals

**Cause?**

- Many causes
- Multi-factorial
- Complex interaction between genes & environment

**Autism Spectrum Disorders**

Impairments in reciprocal social interaction skills, communication skills & stereotyped behaviour, interests or activities.

- Autism
- PDD-NOS
- Asperger’s
- Rett’s
- Childhood Disintegrative Disorder (CDD)

**Autistic Disorder or Autism**

- Impaired development of social interaction & communication & a markedly restricted repertoire of activity & interests.
  *Wide variation of presentations:*
  
  *When you’ve seen one person with autism, you’ve seen one person with autism!*

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M. Herbert Vargas, 2005

Autism Spectrum Disorders aka Pervasive Developmental Disorders

Model of ASD by Martha Herbert

T. Broda, RN[EC], BScN, NP-PHC, CDDN
Social interaction

- Non-verbal behaviours: eye-to-eye gaze, facial expression, body postures, gestures
- Joint attention, pointing, bringing sharing objects of interest

Communication

- Delay or lack of development of spoken language (& no attempt to use gestures)
- Stereotyped or repetitive language or idiosyncratic language
- Lack of make-believe play or social imitative play (according to developmental level)

Behaviours

- Restricted, repetitive stereotyped patterns of behaviour, interests & activities
- Inflexibility (routines, rituals)
- Stereotypical motor mannerisms: hand-flapping, finger twisting
- Persistent preoccupation with parts of objects

Asperger’s Disorder

Impairment in social interaction skills:

- Non-verbal behaviours: eye-to-eye gaze, facial expression, body postures, gestures
- Failure to develop peer relationships (appropriate to developmental to age)
- Joint attention: pointing, bringing sharing objects of interest
- Lack of social or emotional reciprocity

Associated features

- No developmental delay usually
- Strengths in verbal abilities over non-verbal areas
- No delay in language acquisition but may include poor social pragmatic language skills (poor comprehension of jokes, irony, metaphors, typical give & take in a conversation) => difficulties with social interactions
- May have comorbid ADHD
**P.D.D-NOS (Not Otherwise Specified)**
- “atypical autism” do not meet criteria due to late age of onset or mild or atypical presentation of symptoms
- severe and pervasive impairment across all 3 areas but there are not enough symptoms to meet criteria of P.D.D., schizophrenia, schizotypal PD or avoidant PD

**Rett’s Disorder, DSM-IV-TR**
- Rare genetic progressive degenerative disorder, primarily in females (MECP2 gene)
- Characterized by normal prenatal & perinatal development, normal psychomotor development through 5 months of age then decline in growth and loss of skills
- Normal head circumference at birth but then deceleration of head growth btwn 5-48 months

**Rett’s Disorder, DSM-IV-TR**
- Loss of previously acquired hand skills btwn 5-30 months & subsequent development of hand stereotypies (washing, wringing)
- Loss of social engagement, but may develop social interaction later (with eyes)
- Poorly coordinated gait or trunk movements
- Severely impaired expressive and receptive language development, dysphagia
- Severely impaired psychomotor skills

**Childhood Disintegrative Disorder**
- Normal development for at least the first 2 years
- Significant loss of previously acquired skills in at least two of the following areas (before age 10):
  - Expressive or receptive language skills
  - Social or adaptive behaviour
  - Bowel or bladder control
  - Play skills
  - Motor skills

**Screening**
- Parental reports
- Routine Developmental Monitoring: should be done at:
  - 15 months
  - 18 months
  - 24 months

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**Failure to meet developmental milestones**

- No big smiles or other warm, joyful expressions by 6 months;
- No back-and-forth sharing of sounds, smiles or facial expressions by 9 months;
- No babbling by 12 months
- No gesturing (e.g., pointing, waving bye-bye,) by 12 months
- No single words by 16 months
- No two-word spontaneous (not just echolalic) phrases by 24 months
- Loss of any language or social skill at any age

**Screening**

- To obtain instructions and permission information for free use of the M-CHAT: www2.gsu.edu/~wwwpsy/faculty/robins.htm

**Referrals ASAP:**

- Audiology assessment concurrently w/ referral to interdisciplinary ASD team.
- Speech-language pathologist for assessment and intervention concurrently w/ referral to an interdisciplinary ASD team.
- Early intervention or developmental services upon suspicion that they may have an ASD or other developmental delay.

**Team approach:**

- Audiologists
- Behavioural Specialists / Early Interventionists
- Dieticians
- Educational Specialists
- Nurse Practitioners
- Occupational Therapists
- Psychiatrists
- Psychologists
- Social Workers
- Speech Pathologists

**Examples to view:**


**SL-P Role**

- Assessment of communication skills, speech production, dysphagia, AAC, and pragmatic language skills( => social interaction skills).

- Communication:
  1. Expressive language skills: verbal & nonverbal, PECS, use of language (what to say when), writing skills
  2. Receptive language skills: comprehension of verbal information and nonverbal cues, reading, interpretation of facial cues and language in specific contexts

(V. Prengel)
Speech Production

Absence of speech or delay (limited sounds, omissions, substitutions...)
Motor speech disorders are common within ASD (dysphagia!)
- dysarthria: impairments due to neurological systems (weakness of the musculature used to make sounds)
- apraxia of speech(AOS): sensori-motor disorder which impairs the sequence (movement patterns) and position of the muscles and structures involved in voluntary speech production (respiration, jaw, tongue, lips, teeth, palate).
NOTE: individuals with AOS can repeat verbal information yet they may be incapable of producing the same utterance spontaneously (echolalia).

Barriers to Communication

• Impairments in receptive & expressive abilities
• Cognitive impairments
• Pragmatics of language, motivation and interest in communication with others is affected by social impairments
• Communication needs & styles of individuals with ASD are frequently not understood and/or misinterpreted.
• Distraction or decreased attention due to sensory stimuli (environmental or neurological)
• Idiosyncratic behaviour patterns, atypical behaviours

Atypical Behaviours

• Strong resistance to change in routine
• Self-stimulatory behaviour
• Hyper or hyposensitivity to sounds, smells, taste, sight, etc...
• Insensitivity to pain, cold or heat
• Self-injurious behaviour
• Limited interests and activity repertoire

Additional Barriers

• Anxiety
• Impaired sensory processing (ex. not hearing ‘D’ in dog or ‘B’ in boy very well)
• Inconsistent arousal and attending skills
• Impaired speech production
• Use of augmentative and alternative communication affected by poor fine motor skills

Non verbal Communication

• Use of gestures, heads nods and shakes
• Facial expressions
• Eye gaze
• Body language: posture, proximity & orientation to communication partner
• Use of behaviours: requesting items (banging on a cupboard)

Echolalia or Attempts at Communication?

Singing or repeating commercials?
• may be a request for a certain item! (breakfast cereal, etc)

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Communication & Socialization

• AAC: augmentative & alternative communication
  – Lo-tech: use of BoardMaker images for creating a choice board (pointing), visual schedules, & PECS (expressive: get the card/image, degree of iconicity: object, representation(mini), photo of object, cartoon image (color, B & W), stick figures (BLISS board)
  – Hi-tech: computer devices: Dynavox, Oralys, iPad

V. Prengel

More Resources

• PECS: http://www.pecsproducts.com/catalog/
• Do-Watch-Listen-Say by Kathleen Ann Quill ($71.95)

Communication & Socialization

• Social stories by Carol Gray
  http://www.thegraycenter.org/social-stories/what-are-social-stories
• The New Social Stories Book, Carol Gray (10th Anniversary edition) ($39.95)
• Comic Strip conversations, Carol Gray ($12.00)

More resources:

• “Social Behavior Mapping - Connecting Behavior, Emotions and Consequences Across the Day” by Michelle Garcia Winner

Educational & Treatment Approaches

Many strategies including:
• TEACCH: Treatment & Education of Autistic & related Communication- handicapped Children
• ABA (Applied Behavioral Analysis)
  – Lovaas
• Stanley Greenspan
  – Floor time

Senses

• Visual (spatial, color, shape, light, depth)(70% energy to process it!)
• Auditory (underR: hums, craves loud music; overR : covers ears)
• Olfactory & Gustatory (food seeking/avoidance, textures)
• Tactile (touching objects, clothing or touch from others)
• Proprioception (knowing where body parts are, info from joints, stairs in dark)
• Vestibular (human ‘level’, body in space; linear & rotary movement)
• Interoception (internal state, messages from inside the body: hunger, PAIN, bladder fullness, emotions)

A. Eustace, OT, Nfld
Sensory Issues

- Tactile hyposensitivity & proprioception
  - Deep pressure, squeeze machine, weighted vest
- Tactile hypersensitivity
  - Touch (clothes, tags, soft touch, etc)
- Altered sensory perceptions
  (synaesthesia ex: colored hearing)

Perception is Reality!

“There are no bizarre behaviors – more accurately, there are human responses that are not fully understood or appreciated.”

Carol Gray, 2007

Sensory Interventions

- Sensory integration / sensory diet
  - Brushing
  - Compressions (trampoline)
  - Swing use
  - Snoezelen room
- Music therapy

Resources

- Building Bridges through Sensory Integration by Ellen Yack, et al. ($36.95)
- Ocean Drum
- Tangle
- Cool Bananas CD ($24.95)

Screening

- Genetic testing (FraX, TSC, DS, etc) & metabolic testing (PKU) PRN (10%)
- Lead screening (DD & pica).
- Seizure disorders.
- Hearing and vision
- SLP for communication abilities
- Psychiatrist or psychologist
- OT assessment of sensori-motor function

Medical concerns

- Seizures (30-50%)
- GI issues in kids (50%): reflux, diarrhea, constipation, allergies/intolerances, “picky eaters”, dysphagia?
- Sleep problems (latency, staying asleep & duration)
- Comorbidities: CP, Tourette’s ADHD, OCD
- Individual variations: pressure sores (swings), RSI, eyestrain, H/A (computer use)
GI issues
- Picky eaters’ risks: FTT, IDA & other deficiencies (Zn, B12, Ca, protein)
- Sensory assessment & food diary: spicy, crunchy, sweet, salty
- Diarrhea: r/o constipation & food diary needed (juice ++?)
- GERD: behavioral s/s (CdLS study: bite fist, pinch chin/neck, punch chest)
- Allergic GI issues, may even be seasonal!
- Casein intolerance (Mg & Vit D for casein free diets)

Pain assessment
- Vocalizations
- Changes in appetite or sleep
- Changes in activity or behavior: SIB, change in movement, even more talkative!
- Changes in appearance
- Pain reporting? Scales?

Sleep
- Sleep hygiene: routine, bath, meals, exercise, calming activities
- Environmental: noise, lighting, blinds, warmth, comfort, sheets, socks, PJ’s
- White noise, metronome, loud clock!
- Waking d/t medical issue? (GERD? Sz?)
- BB monitor?
- Rx melatonin?

Dental Care
- Desensitization: start at age 3, visit w/ parents/siblings
- Dental mirror
- Multiple visits (smells, etc)
- Bring toys, soothing items
- Storybook (Surrey Place)
- Favorite toothbrush or paste from home

Psychiatric concerns
- Anxiety
- Depression
- Risk of suicide?
- SIB
- OCD?
- Aggression & behavioural outbursts or meltdowns

Resources:
- Social scripts, social stories by Carol Gray
- The Incredible 5-point Scale by Kari Dunn Buron & Mitzi Curtis ($24.95)
- The 5-point Scale & Anxiety Curve Poster by Kari Dunn Buron ($29.95)
- Relaxation & breathing exercises
- (Geneva Center)
### Bookstores

Parentbooks: located in Toronto!
- [http://www.parentbooks.ca/](http://www.parentbooks.ca/)

Brookes Publishing

Cherry Hill Books

### Organizations

DDNA
- [www.ddna.org](http://www.ddna.org)

AADMD
- [www.aadmd.org/](http://www.aadmd.org/)

NADD
- [www.thenadd.org/](http://www.thenadd.org/)

### Resources:

- The Autism Treatment Network at Autism Speaks:

- Autism Central:
  [www.autismcentral.ca/research/](http://www.autismcentral.ca/research/)

- Autism Connects:
  [www.autismconnects.com](http://www.autismconnects.com)

- Autism Society of Canada:
  [www.autismsocietycanada.ca/](http://www.autismsocietycanada.ca/)

### Resources:

- Canadian Autism Intervention Network: [http://www.cairn-site.com](http://www.cairn-site.com)

- Health Canada’s Autism website:
  [www.hc-sc.gc.ca/dc-ma/autism/index_e.html](http://www.hc-sc.gc.ca/dc-ma/autism/index_e.html)

- Surrey Place
  [www.surreyplace.on.ca/](http://www.surreyplace.on.ca/)

- CNSC