Objectives

- To discuss long-term follow-up studies of patients with autism.
- To identify positive and negative prognostic features that are predictive of long-term outcomes.
- To discuss how to apply this information to our patient groups.
When I trained, we knew...

- Better prognosis if:
  - Communicative speech before age 5-6
  - Higher IQ

- “Good outcome” in 5-15%
- 50% adults in residential placement
- 10% adults employed (most in menial jobs)

We also knew...

- Up to 20% show “deterioration” in functioning during adolescence
- 70% of adults and adolescents have “behavior problems”
- 90% have persisting social deficits
- Language improves with age but only 30% reach normal range for comprehension tasks

Do we know more now?

Let's look for cohorts...
N=120

- Population-based from Gothenburg, Sweden
- Autism diagnosed in childhood
- Recruited in 1980’s (DSM-III-R)
  - 76 autistic disorder
  - 42 autistic-like conditions
- Severe MR (IQ <50) in ~half, Mild MR (IQ 50-70) in ~third
- Followed prospectively for 13-22 years
- Reevaluated at ages 17-40 years

6 Died

- Status epilepticus
- Unknown but suspected status epilepticus in sleep
- Fire
- Major heart surgery (trisomy 13)
- Brain tumor
- No information

Outcomes

- Overall outcome “very poor” in 57% (of 108)
  - OBVIOUS VERY SEVERE HANDICAP, UNABLE TO LEAD ANY KIND OF INDEPENDENT EXISTANCE, NO CLEAR VERBAL OR NON-VERBAL COMMUNICATION
- Overall outcome “poor” in 21% (of 108)
  - “OBVIOUS SEVERE HANDICAP, NO INDEPENDENT SOCIAL PROGRESS, SOME CLEAR VERBAL OR NON-VERBAL COMMUNICATIVE SKILLS”
- 4 individuals "independent" (but 3 "fairly isolated")
- Correlations positive for outcome and
  - Childhood IQ
  - Communicative phrase speech at age 6
Other diagnoses

- 8 with psychosis
- 1 with depression
- 23 tics (1 Tourette)
- 32% currently taking neuroleptics
- 50% history of moderate-severe self-injury
- 33% hyperactive
- Violent behavior common
- 40% epilepsy (all onset <20 years)
- "downward shift" on IQ testing from diagnostic study to follow-up
- 12% catatonia
- 17% "clear set-back" in puberty

Conclusions

- Children with autism as diagnosed in the 1960’s, 1970’s, and 1980’s may have an even worse psychosocial outcome than previously believed!
- Autism diagnosis stable
  - Some shift between categories
  - Only 1 individual no longer met criteria for autism spectrum disorder

N=48

- Born 1975-1984
- Diagnosed ASD in childhood at Sunny Hill in Vancouver
- 76 in original group
- Data from 3 times
  - Childhood (mean age = 6.8 years)
  - Adolescent (mean age = 18.2 years)
  - Young Adult (mean age = 24 years)
- Rated work, friendships, independence
  - Issues and In (2003 and)
Outcomes

- "Good" or "very good" in 21%
- "Poor" in 46%
  - REQUIRING SPECIAL RESIDENTIAL PROVISION/HIGH LEVEL OF SUPPORT; NO FRIENDS OUTSIDE RESIDENCE
- 1 death – massive infection
- 2 worked independently, 1 supported self
- Best predictor of outcome = verbal IQ

Other diagnoses

- Many emotional problems
- 58% on medication
  - 39.5% on for behavior (most common = rispiridone)
  - 6 individuals on >3 drugs

Interventions

- High school - 69% special education, 77% aides
- 33% could not read
- 30% attended post-secondary (none complete)
- 57% ever employed
  - Volunteer, sheltered or part-time (average 5h/week)
- 56% live with parents, 35% supported living
Relationships

- 33% report at least one friendship
- 30% regular attendance at social, church, club
- 10% have had romantic relationship
- No current marriage or cohabitation

N=140

- 70 Asperger disorder (males)
- Mean age at diagnosis 11.3 years (5.5-24.5)
- Criteria included IQ>70 (~normal)
- Compared to 70 with autism

  - Understood et al (J Autism Dev Disord 2011)

Outcomes – Asperger group

- 84% met diagnostic criteria
  - 12% not met “clinical diagnosis in autism spectrum”
- Average IQ = 103 (only 1 <70)
  - No decline seen as is reported for autism groups
- 27% “good outcome”
  - Employment/Higher education AND independent living or friendship/relationship
- 26% “restricted” or “poor”
- In comparison - Autism group
  - No good outcome, 93% “restricted”, “poor” or “very poor”
  - Lower intellectual level contributed to poorer outcome
More outcomes

- Living independently
  - 64% of those over 22 in Asperger group
  - 8% of those over 22 in autism group
- Long term relationship
  - 13 current or past in Asperger group
  - 2 current or past autism group
- Psychosis
  - 3 in Asperger group
  - 4 in autism group

N=68

- Adults with autism or Asperger syndrome
- IQ >60
- 8 year period
- UK – supported work preparation, job finding and support
- 68% employed
  - Majority permanent contracts
  - Most administrative, technical, computing work
  - Tanwitz et al (Autism 2009)

Are we further ahead?

Maybe we’re asking the wrong questions...
Q: How can early, intensive training help a genetic disorder?

- Autism is genetic. Environmental intervention improves outcome.
- Brain plasticity?
  - Overcome genetically determined defects with intensive training when children have most reactivity to activity-dependent-regulation.
- Ashwood and Ashwood (Publication year)

Q: Can children with autism “recover”?

- Incorrect original diagnosis?
- Forms of ASD that are alleviated with maturation alone?
- Other biologic changes?
- Optimal response to intervention?

Can children with autism “recover”?

- 3-15% “lose ASD diagnosis”
  - Normal cognitive, adaptive and social skills
- Predictors: ↑ IQ, receptive language, verbal and motor imitation, motor development
- NOT – overall symptom severity or head growth
  - Miletto (Neuropsychol Rev 2003)
Also

- "Favorable"
  - Earlier diagnosis
  - PDD-NOS

- "Unfavorable"
  - Seizures
  - MR
  - Genetic Syndromes

Mechanisms

- Normalizing input
  - Forcing attention outwards or enriching environment
- Promoting reinforcing value of social stimuli
- Preventing interfering behaviors
- Mass practice of weak skills
- Reducing stress and stabilizing arousal

Q: What predicts response to EI?

- Frequency of social initiations
- Level of social avoidance
- Imitation ability
- Core autism symptom severity
- Imitation
- Dysmorphic features
- Pretreatment IQ
- Level of toy play
- Use of language
- Level of social engagement
- Level of intellectual ability
- Language impairment
Q: What about mental illness?

- Depression and anxiety
- ADHD
- Reporting and diagnosis issues
- Huge impact on functioning

Q: Is there a best intervention?

- What “format”?
- How much time?
- Who should administer?
- How much training?
- Who should get the intervention?

Psychosocial Interventions

- Umbrella review
  - Krebs et al (Dev Med Child Neurol 2009)
  - Heterogeneity
    - Methodological quality (weak, prone to bias)
    - Consensus to support “intervention”
    - Little info re: relative effectiveness
Common features of successful interventions

- Comprehensive curriculum focusing on initiation, language, toy play, social interaction, vision and adaptive behavior
- Sensitivity to developmental sequence
- Supportive, empirically validated teaching strategies (applied behavior analysis)
- Behavioral strategies for reducing interfering behaviors
- Involvement of parents
- Gradual transition to more naturalistic environments
- Highly trained staff
- Supervisory and review mechanisms
- Intensive delivery of treatment (eg 52 hr/week for at least 2 years)
- Initiation by 2-4 years

What does it all mean?

- Outcome is better if:
  - Higher IQ
  - Early language
- Cohorts show differences over time but more with differences between groups of patients
- Be careful with interpretation of groups compared with each other...
  - Do worse with no intervention
  - Short term and small size outcomes matter!
- Need better data!

Back to the Beginning
What should we tell families?

- Individual and complex
- Severe group
- IQ and early language
- Early intervention
- Shopping list
- HOPE

My Worries

- Broadened definition
- Heterogeneous disorders
- Bias
- Outcome not as improved as it appears
- Apples, oranges and bananas
- Asking the wrong questions

Down Syndrome

No, I have not included slides from the wrong talk...
Think about Down Syndrome

- Is it genetic?
- Does early intervention improve outcome?
- Is there a difference in cohorts over time in terms of living arrangements, work, etc...?
- What are the predictors of outcome?
- What do you tell families?
- So what is the difference?

References