Cognitive & Behavioral Issues Following Epilepsy Surgery

Outline

- Areas of functioning in the brain
- Pediatric Neuropsychology
- Domains of testing
- Effects of epilepsy & surgery
- Recommendations

Outline

- Brain Functions and Learning Disorders

Function
- Phonological Processing
- Executive Functions
- Spatial Cognition
- Social Cognition
- Long-term Memory

Localization
- Left Perisylvian
- Prefrontal Area
- Posterior Right
- Limbic, Orbital, Right
- Hippocampus, amygdala

Neuropsychology

is a clinical specialty concerned with the cognitive, behavioral, and emotional problems that may arise from known or suspected brain dysfunction.
Pediatric Neuropsychological Evaluation: Before & After Surgery

- Intellectual Functioning
- Academic Achievement
- Attention and Concentration
- Verbal and Visual Memory
- Problem Solving Skills
- Receptive and Expressive Language
- Visual-Perceptual Abilities
- Sensorimotor Skills
- Personality and Emotional Status
- Behavioral Functioning

Intellectual Functioning

- Verbal Functioning - comprehension, reasoning, expression (“crystallized”)
- Nonverbal Functioning - visuospatial processing, reasoning (“fluid”)

Academic Achievement

- Reading recognition & comprehension
- Mathematical calculation & application
- Spelling & dictation
- Written expression
- Academic fluency

Memory Functions

- Attention
- Immediate verbal/auditory retention span
- Immediate visual retention span
- Learning & efficacy of retrieval
- Intermediate or long-term memory
- Remote memory
- Tactile memory
Facial Recognition

Visual Perceptual Skills
- Visuoconstruction
- Patterns/sequences
- Location in space
- Facial recognition/Facial expressions
- Visual abstract reasoning
- Personal space
- Integration/organization
- Attention to visual details

Language Functions
- Auditory & verbal comprehension
- Vocabulary
- Verbal fluency, volume, rate
- Articulation
- Naming
- Pragmatic skills, prosody, gestures
Executive Functioning

• Goal formulation
• Initiate, maintain, switch, & stop
• Mental flexibility
• Planning & decision making
• Monitor, self-correct, & persist
• Nonverbal problem-solving

Motor

• Grip Strength
• Fine Motor
  – Tapping Speed
  – Coordination/Dexterity
• Gross Motor
  – Running, skipping, jumping, balance, throwing, catching, up/down stairs

Psychosocial Functioning

• Personality
• Emotions
• Behavior
• Family dynamics
• Social network
• Situational influences

Learning & Epilepsy

• Left temporal – verbal memory deficits
• Right temporal – visual memory deficits
• Bifrontal – word or design retrieval deficits
• Generalized – variable attention
• FLE – story & sentence recall without cues, behavioral change (impulsivity, difficulty multi-tasking, limited organizational skills), possible motor issues
• Parietal – sensory changes, math calculation, visual perception, awareness of body in space
• Occipital – visual changes
• Effects of medication on learning & behavior
Other Cognitive & Behavioral Effects of Epilepsy

- Greater risk for LD
- Disruptions in attention & school attendance
- Higher rates of mood/affect disturbance
- Slower processing speed
- Selective attention more affected in focal
- Sustained attention more affected in generalized
- Executive dysfunction
- Most of these are still present post-surgery

Rehabilitation Issues After Surgery

- Depends upon location of surgery
- Depends upon age of child
- Medication effects
- Changes in behavior
- School intervention (IEP, 504 Plan)
- Supplemental therapies (OT, ST, PT)
- Psychotherapy – individual & family

Case Study

- 13 yo, left handed female
- Partial focal szs at 18 mos.
- GTC szs at 3 years
- Regression of milestones – speech & right hand
- Tried on multiple medications but continued intractible szs
- MRI revealed extensive cortical malformation - L temporal
- EEG – L temporal spike/wave discharges
- Underwent L temporal lobectomy with mesial structures
- Taking Tegretol & Lamictal currently & seizure-free

Recommendations

- IEP under OHI
- Verbal reinforced with visual
- Tutoring in reading and writing
- Scaffold/multiple choice to aid word retrieval deficits
- Break down verbal information & utilize repetition
- Visual support (picture schedules, picture memory book)
- Work with a therapist to help her express feelings
- Minimize oral response in class
- Extended time on written tests

Thank you!