CEREBRAL PALSY AND MENTAL RETARDATION

DEFINITION

It is a disorder of posture movement and tone due to a static encephalopathy acquired during brain growth in fetal life infancy or early childhood. Though the brain growth is unchanging the effects are dynamic as the brain matures and the child development capability extends.

- Incidence 1.5 -2.5/ 1000 live births
- Associated features –
  - Mental retardation 50-75 %
  - Ocular involvement 50-70%
  - Behavioral problem 30-50%
  - Seizures 25-35%
  - Speech and language disorder 15-20%
  - Extrapyramidal signs 10%
  - Sensory impairment
  - Feeding difficulty

ETIOLOGY:

- Prenatal:
  - Infection, anoxia, toxic, vascular, Rh disease, genetic, congenital malformation of brain
- Natal :
  - Anoxia, traumatic delivery, metabolic
- Post natal:
  - Trauma, infection, hyperbilirubinemia

Cerebral Palsy: Topographic

- Monoplegic
- Hemiplegic
- Quadraplegic
- Diplegic
Cerebral Palsy

- Athetoid
- Ataxic
- Rigid-Spastic
- Hypotonic
- Mixed

Spastic diplegia

- Perivenriular hypoperfusion occurring at 26—36 wks of gestation in utero manifesting as periventricular leukomalacia
- Almost 2/3 of CP child are spastic
- Birth asphyxia causes 1/10 spastic CP child

Hemiplegia

- Commonest in term babies
- PVL occurs in 80% of infants
- Presents in second half of first year of life with problem in pincer grasp finger movements fisting and decreased movement in the affected side.
- They tend to walk on toes and keeps the heel off the ground.
There is asymmetric growth
May be asso. with sensory loss hemianopia dyskinetic movements seizures and learning disability

**Spastic quadriplegia**
- It is the most severe form of CP child
- Associated with severe learning disorder
- 40% are preterm babies
- 90% has epilepsy
- Bulbar palsy and cortical blindness are common
- Infarcts in basal ganglia and thalamus and subcortical leukomalacia are common
- Multicystic encephalomalacia are seen in MRI

**Dyskinetic**
- All four limbs with bulbar palsy having fluctuating tone and involuntary movements
- Damage in subcortical grey matter
- Common in torch infection
- In infancy the children may be hypotonic with poor conjugate eye movements. They cannot speak and have feeding problems.
- Involuntary movements appears in the 2nd year of life
Ataxic CP

- In infancy hypotonia with delayed milestone like sitting late
- Truncal ataxia predominates

Prevention

- PROVEN
  MMR vaccination
  I supplementation
  anti D for rh−ve mother
  delivery of very preterm infants in tertiary care center
  home support for socially deprived parents
- Probable
  early routine ultra sound
  phototherapy for jaundice
  vitamin k for hemorrhage
  child abuse prevention
- Possible
  mode of delivery for preterm
  zinc and folic to prevent IUGR
  operative delivery for foetal distress
  rescue therapy for birth asphyxia
- Doubtful
  multifoetal pregnancy prevention
DIAGNOSIS:

- The diagnosis of cerebral palsy is generally based on clinical picture.
- Other conditions that should be considered when evaluating a patient with suspected cerebral palsy include, hereditary spastic paraplegias, Rett syndrome, and tethered spinal cord.
- Coagulation studies
- metabolic or genetic screening
- Lactate and pyruvate values
- Thyroid function
- ↑ ammonia levels
- Chromosomal analysis
- EEG BRAIN
- Cranial ultrasonography, CT, MRI

MANAGEMENT:

- A team of physicians from various specialties, as well as occupational and physical therapists, speech pathologists, social workers, educators, and developmental psychologists provide important contributions to the treatment of these children.
- Management should be directed at promoting the child's
  
  i. Social and emotional development  
  ii. Communication  
  iii. Education  
  iv. Nutrition  
  v. Mobility  
  vi. Maximal independence in activities of daily living  
  vii. Appearance as nearly normal as possible  
  viii. Seizures control  
  ix. Prevent contractures formation

- Physical therapy is aimed at improving infant-caregiver interaction, giving family support, supplying resources, and parental education, as well as at promoting motor and developmental skills
- Occupational Therapy (OT) focuses on the development of skills necessary for the performance of activities of daily living
- OT also addresses cognitive and perceptual disabilities
- Neurodevelopmental Therapy and Sensory Integration are specialized techniques used by the therapists to achieve these goals

FAMILY COUNSELLING

Doctor should emphasize that CP is
* Not mental illness
* Not necessarily associated with MR
* Not contagious
* Not inherited
* Not curable

Child with mild CP do well in main stream school but child with moderate to severe CP need to be educated in special school.

*Equal opportunities, protection of rights and full participation
*Non discrimination

MENTAL RETARDATION

- Mental retardation refers to a group of disorders that have in common deficits of adaptive and intellectual function and an age of onset before maturity is reached.

Diagnostic Criteria for Mental Retardation

- Significantly subaverage intellectual functioning: an IQ score of approximately 70 or below on an individually administered clinical judgment of significantly subaverage intellectual functioning).
- Concurrent deficits or impairments in present adaptive functioning (i.e., the person's effectiveness in meeting the her age by his or her cultural group) in at least two of the following areas: communication, self-care, home living, community resources, self-direction, functional academic skills, work, leisure, health, and safety.
- The onset is before age 18 years.

- Code based on degree of severity reflecting level of intellectual impairment:
  - **Mild Mental Retardation**: IQ level 50-55 to approximately 70.
  - **Moderate Mental Retardation**: IQ level 35-40 to 50-55.
  - **Severe Mental Retardation**: IQ level 20-25 to 35-40.
  - **Profound Mental Retardation**: IQ level below 20-25.

**Mild Mental Retardation**

- Largest group of MR patients (about 85%)
- Used to be referred to as "educable"
- As a group, they often develop social, communication, and motor skills during the preschool years without concern.
- At a later age, the MR becomes apparent.
- Can usually learn to live independently or in supervised settings.

**Moderate Mental Retardation**

- About 10% of the MR population
- Most acquire communication skills during early childhood.
Can benefit from vocational training and with moderate supervision, attend to personal care.

Unlikely to progress beyond 2nd grade in academic subjects.

May learn to travel independently in familiar places.

Difficulties in social skills and recognizing social conventions can interfere with peer relationships in adolescence.

Can live in the community, usually with supervision.

**Severe Mental Retardation**

- 3-4% of the MR population
- During early childhood, acquire little or no communicative speech
- During school-age period, may learn to talk and be taught elementary self-care skills.
- Unlikely to progress beyond pre-academic skills (e.g., letter recognition, simple counting)

**Profound Mental Retardation**

- About 1-2% of the MR population
- Most of these individuals have an identifiable neurological condition that accounts for their MR
- Considerable impairments in early childhood in sensorimotor functioning.
- Optimal development may occur in highly-structured environments.
- Motor development, self-care, and communication skills may improve if appropriate training is provided.

**CAUSES OF MENTAL RETARDATION:**

- Chromosomal disorders.
- Genetic syndromes.
- Developmental brain abnormality.
- Inborn errors of metabolism.
- Neurodegenerative disorders.
- Congenital infections.
- Familial retardation.
- Perinatal causes e.g. infections like rubella, CMV, toxoplasmosis, HIV.

**Common Presentations of Mental Retardation:**

- Newborn Dysmorphisms.
- Major organ system dysfunction (e.g., feeding and breathing) Early infancy (2-4 mo).
- Failure to interact with the environment, Concerns about vision and hearing impairments Later infancy (6-18 mo)
- Gross motor delay Toddlers (2-3 yr)
- Language delays or difficulties Preschool (3-5 yr)
- Behavior difficulties, including play
• Delays in fine motor skills: cutting, coloring, drawing School age (over 5 yr)
• Academic underachievement  Behavior difficulties (attention, anxiety, mood, conduct, and so on)

DIAGNOSIS
• The formal diagnosis of mental retardation requires the administration of individual tests of intelligence and adaptive functioning.
• The most commonly used intelligence tests are the Bayley Scales of Infant Development (BSID-II), the Stanford-Binet Intelligence Scale, and the Wechsler Intelligence Scales.
• Rates of comorbid mental disorders in individuals with MR is 3-4 times greater than in the general population
• Common comorbidities: ADHD, Mood Disorders, Stereotypic Movement Disorders
• MR due to Down syndrome at a higher risk for Dementia of the Alzheimer’s Type.
• The most commonly used test of adaptive behavior is the Vineland Adaptive Behavior Scale (VABS).
• This test involves parental and/or caregiver/teacher semistructured interviews that assess adaptive behavior in four domains: communication, daily living skills, socialization, and motor skills.

WORKUP
• The examiner must determine the nature and extent of the laboratory investigation following a history and physical examination.
• Neuroimaging.
• metabolic testing.
• molecular and chromosomai blood testing.
• electroencephalography (EEG)
• Auditory evoked potentials.
• Visual evoked potentials.

MANAGEMENT
• Although mental retardation is not treatable, many associated impairments are amenable to intervention and may benefit from early identification.
• To maximize the individual’s functional independence, the following areas should be addressed by the physician at least annually:
• Treatment of associated impairments
• Pharmacotherapy
• Behavior management
• Educational services
• Recreational needs
• Family counseling
• Because obesity is more prevalent in those with MR, regular physical activity should be included in the management plan.
• No specific pharmacologic treatment is available for cognitive impairment in the developing child or adult with MR.
• Medications, when prescribed, are targeted to specific comorbid psychiatric disease or behavioral disturbances.

Thankyou