Intellectual Disability

INTRODUCTION AND HISTORY

- Intellectual disability formerly known as mental retardation can be caused by a range of environmental and genetic factor that lead to a combination of cognitive and social impairments.
- The earliest reference to intellectual disability dates to the Egyptian papyrus of Thebes in 1552 B.C.(Harris 2006)
- Greek and Roman philosophers, who valued reasoning abilities, disparaged people with intellectual disabilities as barely human.

INTRODUCTION AND HISTORY

- The oldest physiological view of intellectual disability is in the writings of Hippocrates in the late fifth century B.C Who believed that it was caused by an imbalance in the four humors in the brain.

INTRODUCTION AND HISTORY

- In the 13th century, England declared people with intellectual disabilities to be incapable of making decisions or managing their affairs.

- In the 17th century, Thomas willis provided the first description of intellectual disabilities as a disease. He believed that it was caused by structural problems in the brain. According to willis, the anatomical problems could be either an inborn condition or acquired later in life.

INTRODUCTION AND HISTORY

- 18th and 19th centuries, housing and care moved away from families and towards an asylum model.

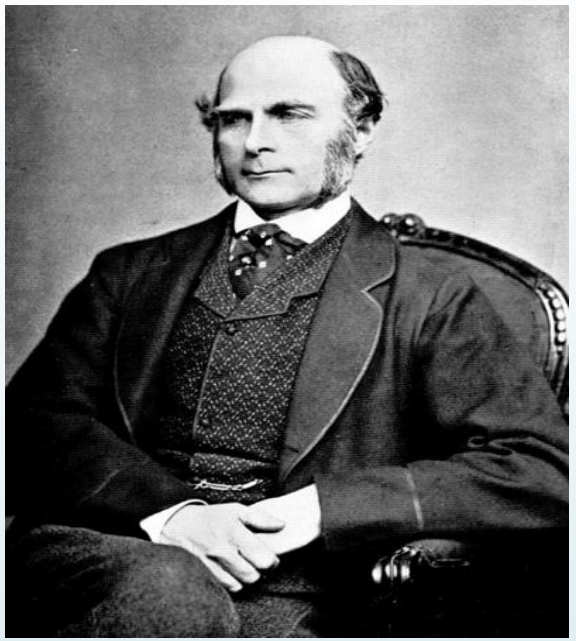
- Children with intellectual disabilities and behavioural abnormalities were removed from their families and placed in specialized institutions which provided very minimal basic education and survived on the services provided the residents.

INTRODUCTION AND HISTORY

- Jean-marc Itard is credited with creating the first systematic intervention program for a person with intellectual disability in late 18th century france, and the first residential facility was founded in the mid-19th century in switzerland.

INTRODUCTION AND HISTORY

- In the late 19th century, in response to Charles Darwin's on the origin of species, francis galton proposed selective breeding of humans to reduce intellectual disabilities.
- Psychological tests to assess intelligence were developed in the 20th century, which increased case identification.



DEFINITION

AAIDD	DSM5	ICD10
American association on intellectual and developmental disability (AAIDD) defines intellectual disability as a disability characterized by significant limitations in both intellectual functioning (reasoning,learning and problem solving) and in adaptive behaviour(conceptual,social and practical skills) that emerges before the age of 18 years.	According to **DSM5** Intellectual disability (intellectual developmental disorder) is a disorder with onset during the developmental period that includes both intellectual and adaptive functioning deficits in conceptual, social, and practical domains.	ICD 10 Mental retardation is a condition of arrested or incomplete development of the mind, which is especially characterized by impairment of skills manifested during the developmental period, which contribute to the overall level of intelligence, i.e. cognitive, language, motor, and social abilities.

ICD-10 DIAGNOSTIC CRITERIA FOR MENTAL RETARDATION

CLASS	DEGREE	IQ
F70	Mild mental retardation	50－69
F71	Moderate mental retardation	35－49
F72	Severe mental retardation	20－34
F73	Profound mental retardation	<20
F78	Other mental retardation Sensory, physical, behavioral impairments preclude standardized IQ testing.	
F79	Unspecified mental retardation	

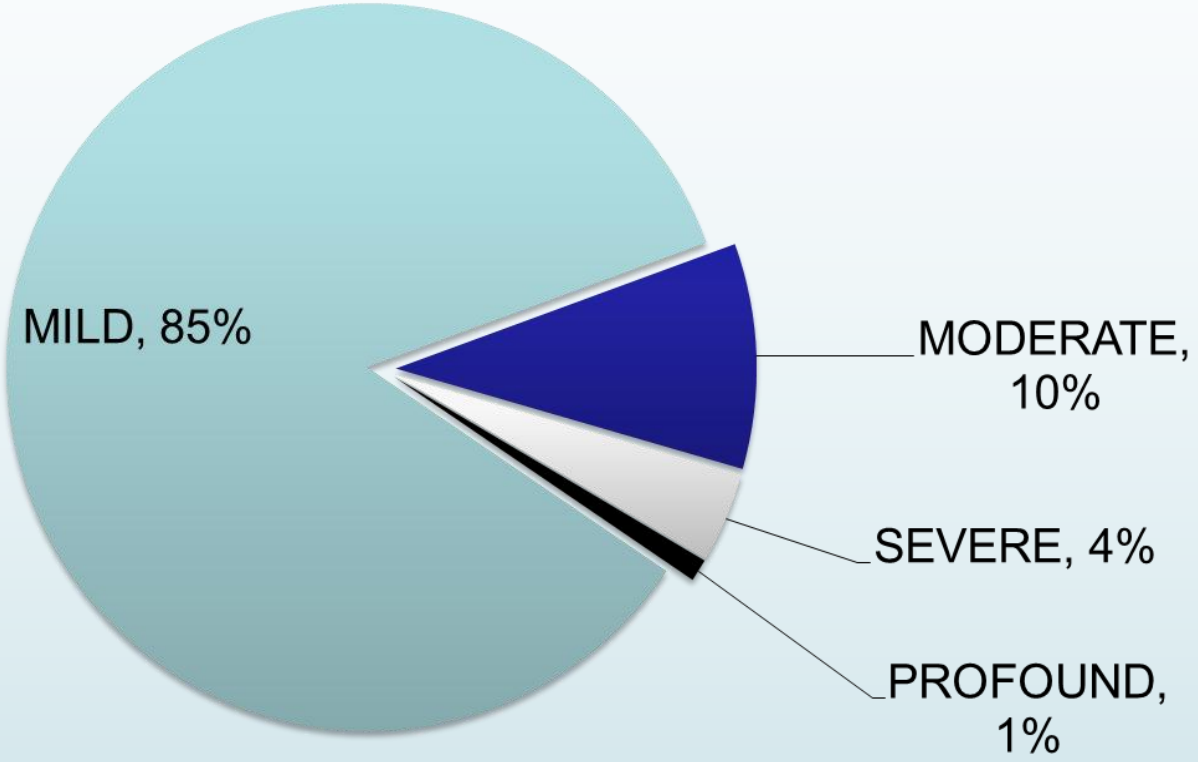
ICD-10 DIAGNOSTIC CRITERIA FOR MENTAL RETARDATION

CLASS	Specifiers for extent of behavioral impairment	
F7x.0	No, or minimal, impairment of behavior	
F7x.1	Significant impairment of behavior requiring attention or treatment	
F7x.8	Other impairments of behavior	
F7x.9	Without mention of impairment of behavior	

EPIDEMIOLOGY

- Intellectual disability affects approximately 1-4% of the population in developed countries.
- In general it is considered that 2% of the Indian population constitutes persons with this disability.
- Mental retardation is about 1.5 times more common among men than among women.

DISTRIBUTION OF DISABILITY

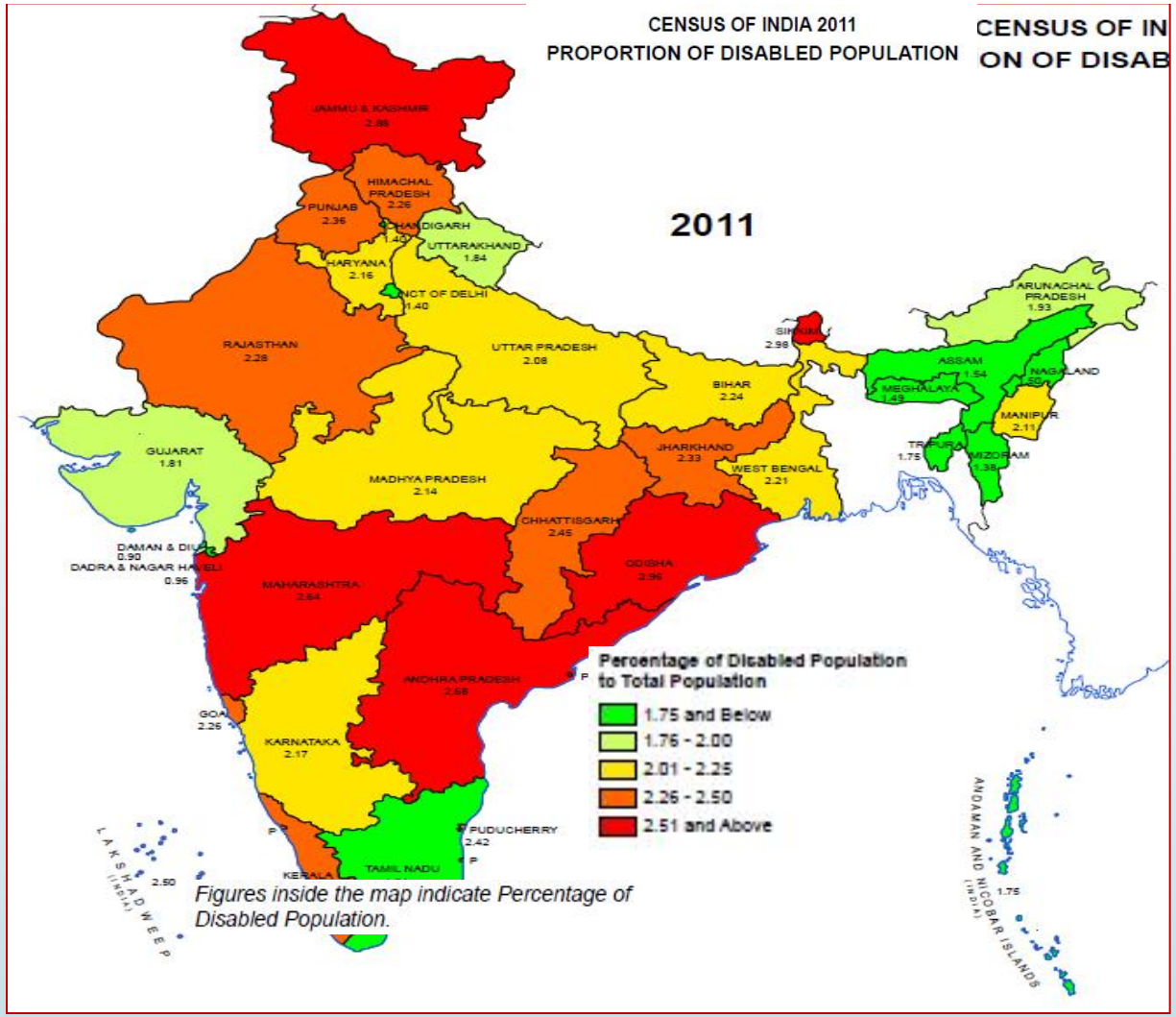


EPIDEMIOLOGY

- According to census 2011 data, there are currently 1,505,624 ‘Mentally Retarded’ people in India.
- In rural areas, the incidence of mental retardation is 3.1% and in urban, it is 0.9%.
- The national institute for the mentally handicapped (NIMH), Secunderabad mentions that 2% of the general population is intellectually disabled.
- Three quarters of them are with mild retardation and one-fourth are with severe retardation (panda, 1999).

CENSUS OF INDIA 2011

PROPORTION OF DISABLED POPULATION



CLASSIFICATION

- Mild intellectual disability (IQ 50 to 70)
- Moderate intellectual disability (IQ 35 to 50)
- Severe intellectual disability (IQ 20 to 35)
- Profound intellectual disability (IQ 20 and below)

Mild

- 85% of ID Population
- Can generally learn reading, writing, and math skills between third- and sixth-grade levels. May have jobs and live independently.

Moderate

- 10% of ID Population
- May be able to learn some basic reading and writing. Able to learn functional skills such as safety and self-help. Require some type of oversight/supervision.

Severe

- 5% of ID Population
- Probably not able to read or write, although they may learn self-help skills and routines. Require supervision in their daily activities and living environment.

Profound

- 1% of ID Population
- Require intensive support. May be able to communicate by verbal or other means. May have medical conditions that require ongoing nursing and therapy.

Mild intellectual disability

- It is most common with 85% of the population with intellectual disability.
- They are often not identified until 1st or 2nd grade, when academic demand increase.
- By late adolescence, they often acquire academic skills at approximately a 6th grade level

Mild intellectual disability

- **Developmental characteristics of Mild Intellectual disability**

- **Preschool age (0-5 yrs) Maturation and development-** Can develop social and communication skills, minimal retardation in sensorimotor areas often not distinguished from normal age until late.
- **School age(6-20 yrs) training & education-** Can learn academic skills up to approx. 6th grade level by late teens; can be guided toward social conformity

Mild intellectual disability

- **Adult(21 yrs & above) social and vocation adequacy-** Can usually achieve social & vocational skills adequate to minimal self-support, but may need guidance & assistance when under unusual social or economic stress

Moderate Intellectual Disability

- 10% of the people with intellectual disability have moderate intellectual disability.
- Most children with moderate intellectual disability acquire language and can communicate adequately during early childhood.
- They are challenged academically and can not achieve above a second or third grade level.

Moderate Intellectual Disability

- During adolescence, socialization difficulties set them apart, social and vocational support is beneficial.
- As adults, may be able to perform semiskilled work under appropriate supervision.

Moderate Intellectual Disability

- **Developmental characteristics of moderate intellectual disabilities**
- Preschool age(0-5yrs)- can talk or learn to communicate; poor social awareness; fair motor development; profits from training in self-help; can be managed with moderate supervision
- School age(6-20yrs)- can profit from training in social & occupational skills; unlikely to progress beyond second-grade level in academic subjects; may learn to travel alone in familiar places

Moderate Intellectual Disability

- Adult(21yrs & above)- may achieve self-maintenance in unskilled or semi-skilled work under sheltered conditions; needs supervision & guidance when under mild social or economic stress

Severe Intellectual Disability

- Severe Intellectual Disability represents 4% of individuals with intellectual disability.
- They may be able to develop communication skills in childhood and often can learn to count as well as able to recognize words that are critical to functioning.
- They may adapt well to supervised living situations such as group homes and may be able to perform work-related tasks under supervision.

Severe Intellectual Disability

- **Developmental characteristics of severe intellectual disability**
- Pre-school age(0-5yrs)- poor motor development; speech minimal; generally unable to profit from training in self-help; little or no communication skills
- School age(6-20yrs)- can talk or learn to communicate; can be trained in elemental health habits; profits from systematic habit training; unable to profit from vocational training

Severe Intellectual Disability

- Adult(21yrs & above)- may contribute partially to self-maintenance under complete supervision; can develop self-protection skills to a minimal useful level in controlled environment

Profound Intellectual Disability

- Profound Intellectual disability constitute approximately 1-2% of individuals with intellectual disability.
- Most people have identifiable causes for their condition.
- They may be taught some self-care skills and learn to communicate their needs given the appropriate training.

Profound Intellectual Disability

- **Developmental characteristics of profound intellectual disability Pre-school** age(0-5years)- gross disability; minimal capacity for functioning in sensorimotor areas; needs nursing care; constant aid and supervision required
- School age(6-20yrs)- some motor development present; may respond to minimal or limited training in self help
- Adult(20yrs & above)- some motor and speech development; may achieve very limited self-care; needs nursing care

Unspecified Intellectual Disability

- It is included in the DSM 5 and is reserved for individuals over the age of 5 years who are difficult to evaluate but are strongly suspected of having intellectual disability.
- They may have sensory or physical impairment such as blindness or deafness, or concurrent mental disorders, making it difficult to administer typical tools to aid in determining adaptive functional impairment.

Causes of Intellectual Disability

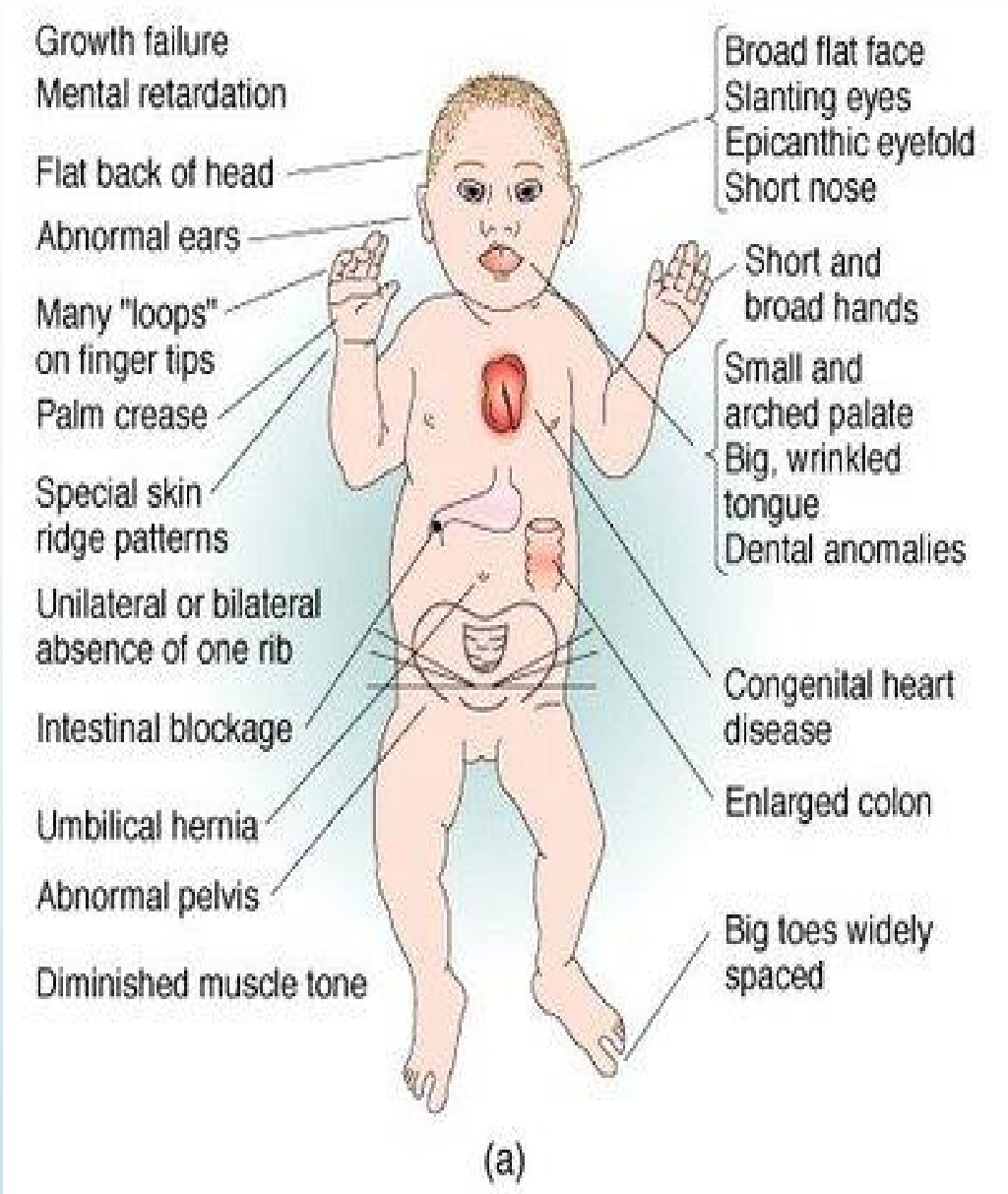
Prenatal causes	
• Chromosomal disorders	Down syndrome
Monogenic mutations	Tuberous sclerosis,PKU,Fragile x syndrome
Multifactorial	Familial mental retardation
Malformation syndrome due to microdeletions	Prader willi Williams,Angelman syndrome
• **Congenital malformations**	
Malformations of CNS	Neural tube defects
Multiple malformations syndromes	Cornelia de lange syndrome
• Exposure	
Maternal infections	Congenital Rubella,HIV
Teratogens	Fetal alcohol syndrome
Toxemia placental insufficiency	Prematurity

Causes of Intellectual Disability

Perinatal causes	
Infections	Meningitis
Delivery problems	Asphyxia
others	Hyperbilirubinemia
Postnatal causes	
infections	Encephalitis
Toxins	Lead poisoning
other	Trauma,Brain tumors
Psychosocial problems	Poverty,Psychotic illness
Unkown causes	

DOWN SYNDROME

- Down syndrome (trisomy 21)- children with down syndrome as observed to have characteristic physical attributes, including slanted eyes, epicanthal folds and a flat nose.
- Prevalence of down syndrome is 15 in every 10,000 live births,
- For women older than 32 years of age, the risk of having a child with down syndrome increases. (1 in 100 live births)



DOWN SYNDROME

- Most children with down syndrome have mild-moderate intellectual disability.
- Children with down syndrome have typical placid, cheerful and co-operative and adapt easily at home.
- Adolescents with Down's syndrome may experience more social and emotional difficulties and behavior disorders and there is increased risks for psychotic disorders.

DOWN SYNDROME

- Down syndrome is characterized by deterioration in language , memory, self-care skills and problem-solving by the 3rd decade of life.

FRAGILE X SYNDROME

- It is the second most common single cause of intellectual disability.
- The syndrome results from a mutation on the X chromosome at what is known as fragile site
- It occur in about 1 of every 1000 males and 1 of every 2000 females.

FRAGILE X SYNDROME

- The typical phenotype includes a large, long head, and ears short stature, hyperextensible joints and postpubertal macroorchidism.
- Associated Intellectual Disability range from mild to severe.
- There is a high rate of ADHD, Learning Disorders and autism-spectrum disorders

- normal structure
- broad forehead
- elongated face
- large prominent ears
- strabismus (crossed eyes)
- highly arched palate
- hyperextensible joints
- hand calluses (from self-abuse)
- pectus excavatum (indentation of chest)
- mitral valve prolapse (benign heart condition)
- enlarged testicles
- hypotonia (low muscle tone)
- soft, fleshy skin
- flat feet
- seizures (in about 10 percent)

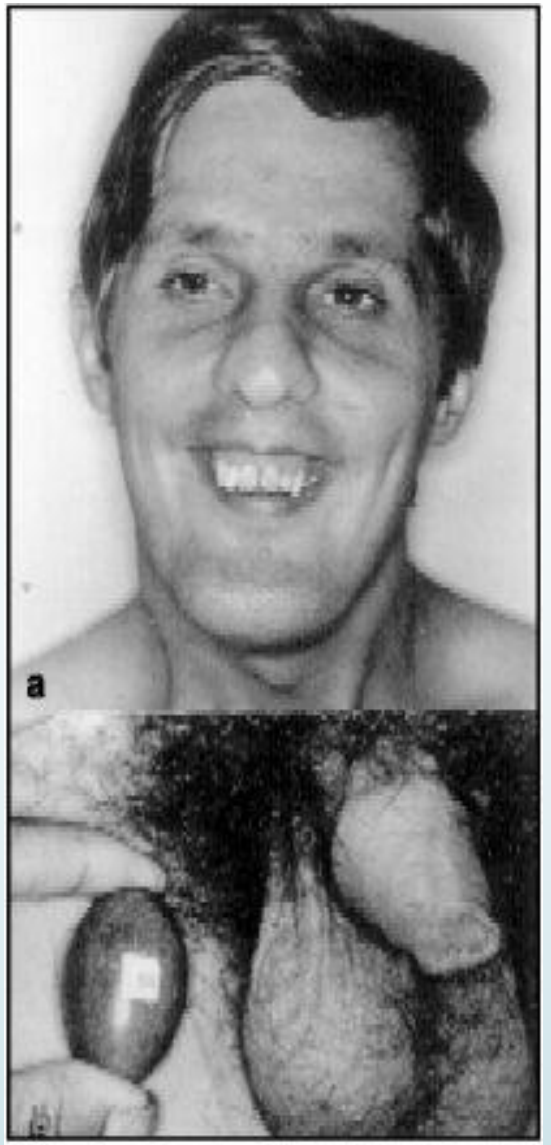


Fig 3. (a) Patient III3 (family 1) with long and narrow face and (b) macro-orchidism (testicular volume= 56 ml).

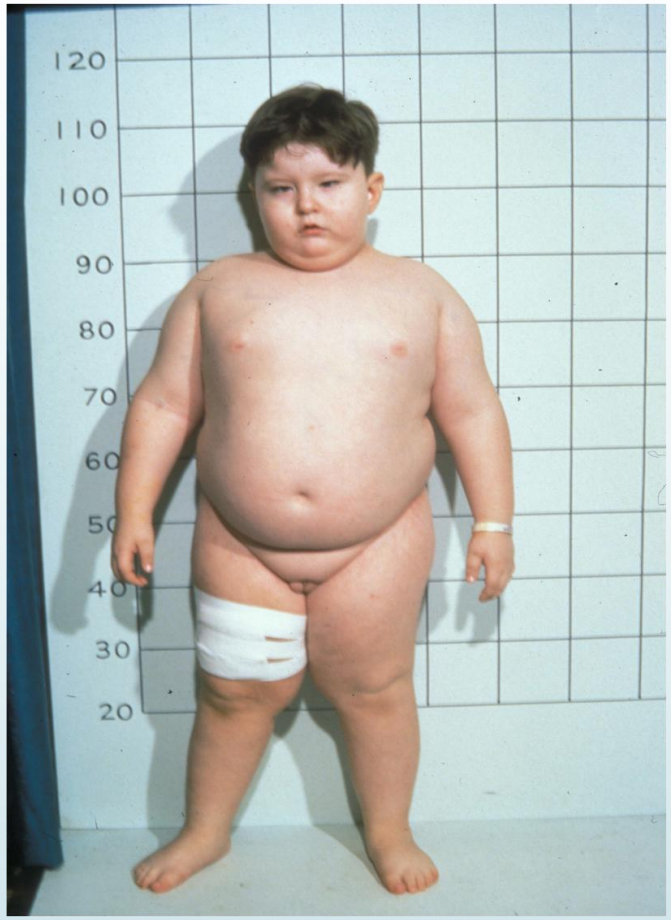
FRAGILE X SYNDROME

- Deficits in language function include rapid perseverative speech with abnormalities in combining words into phrases and sentences.
- They have strong skills in communication and sociallisation,their intellectual functions seem to decline in pubertal period.

PRADER-WILLI SYNDROME

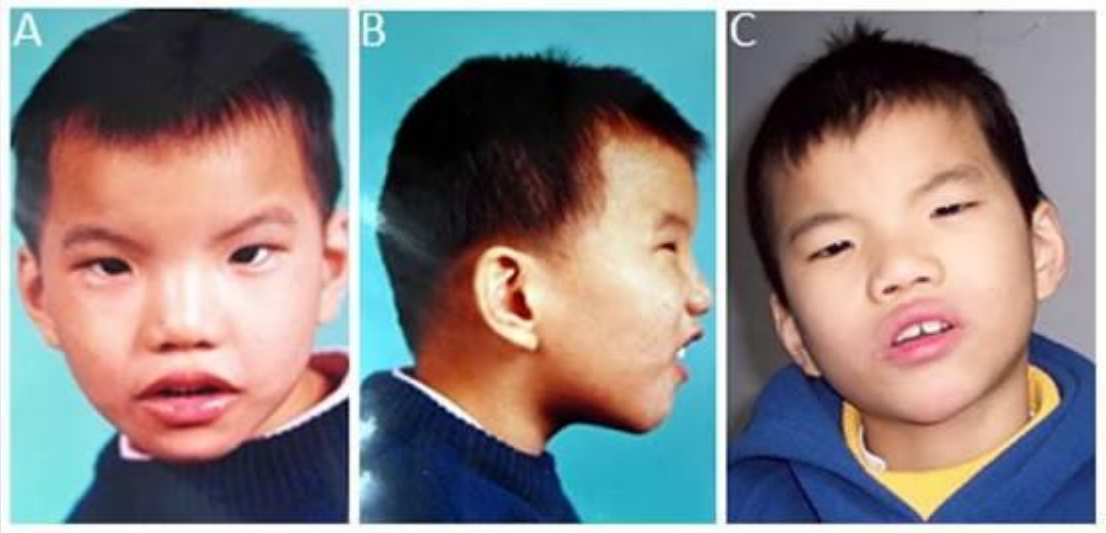
- It is postulated to result from a small deletion involving chromosome 15, usually occurring sporadically.
- Its prevalence is less than 1 of 10,000.
- Persons with the syndrome exhibit compulsive eating behavior and often obesity, mental retardation, hypogonadism, small stature, hypotonia, and small hands and feet.
- Children with the syndrome often have oppositional and defiant behavior.

PRADER-WILLI SYNDROME



CAT'S CRY (CRI-DU-CHAT) SYNDROME

- Children with cat's cry syndrome lack part of chromosome 5. They are severely retarded and show many signs often associated with chromosomal aberrations
- Severe retardation
- Microcephaly
- Low-set ears
- Oblique palpebral fissures
- Hypertelorism
- Micrognathia.

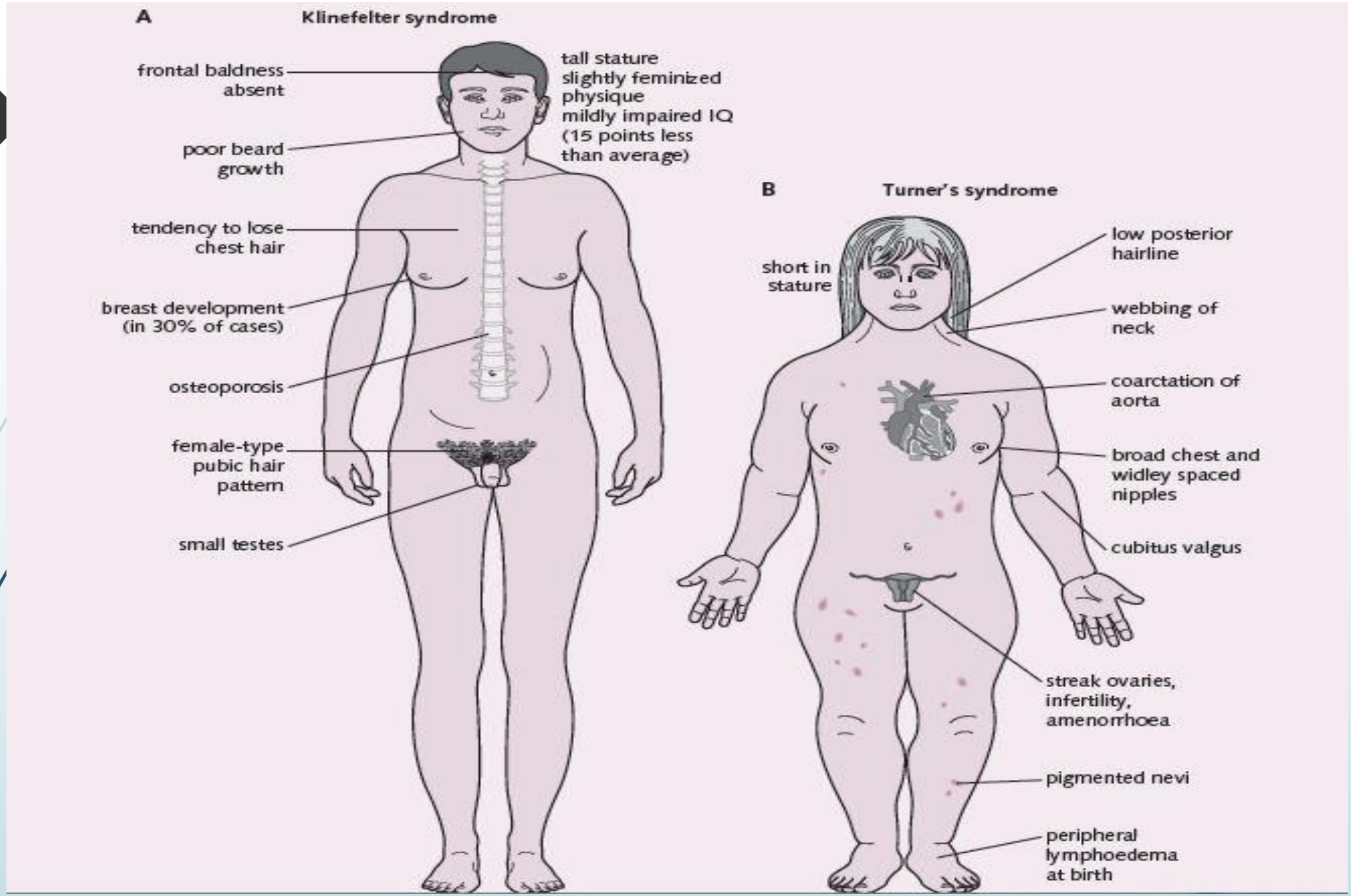


CAT'S CRY (CRI-DU-CHAT) SYNDROME

- Difficulty swallowing and sucking
- Low birth weight and poor growth
- Hyperactive, aggressive, and repetitive movements
- The characteristic cat-like cry caused by laryngeal abnormalities that gave the syndrome its name gradually changes and disappears with increasing age.

KLINEFELTER'S SYNDROME & TURNER'S SYNDROME

- Turner syndrome occurs in 1/2500 live births. It is caused by a partial or complete absence of one of the X chromosomes in a female
- In the case of Klinefelter syndrome, the male has 2 X chromosomes and 1 Y chromosome


A
Klinefelter syndrome
frontal baldness absent
poor beard growth
tendency to lose chest hair
breast development (in 30% of cases)
osteoporosis
female-type pubic hair pattern
small testes
tall stature
slightly feminized physique
mildly impaired IQ (15 points less than average)
B
Turner's syndrome
short in stature
low posterior hairline
webbing of neck
coarctation of aorta
broad chest and widley spaced nipples
cubitus valgus
streak ovaries, infertility, amenorrhoea
pigmented nevi
peripheral lymphoedema at birth

WILLIAM'S SYNDROME

- Williams' syndrome is caused by a microdeletion on chromosome 7 that includes the gene for elastin, a protein that provides strength and elasticity to certain tissues such as the heart, skin, blood vessels, and lungs. The condition affects 1 in 7,500 individuals

WILLIAM'S SYNDROME

PHYSICAL FEATURES

- Short stature
- Elfin like facies
  - Broad forehead
  - Depressed nasal bridge
  - Stellate pattern of the iris
  - Widely spaced teeth
  - Full lips
- Renal and cardiovascular abnormalities
- Thyroid abnormalities
- Hypercalcemia

BEHAVIOURAL FEATURES

- Anxiety
- Hyperactivity
- Verbal skills > visual spatial skills

PHENYLKETONURIA

- It was 1st described in 1934 by Ivar Asbjorn Folling as an inborn error of metabolism.
- It occurs in about 1 in every 10000-15000
- It is transmitted as a simple recessive autosomal Mendelian trait.
- PKU is largely preventable with a screening for it, which, if positive, should be prescribed by a phenylalanine diet.

PHENYLKETONURIA

- Most patients with PKU are severely intellectually disabled but some are reported to have borderline or normal intelligence.
- Typically, patients with PKU are reported to be hyperactive and irritable.
- Verbal and non-verbal communication is commonly severly impaired or non-existent and the children's co-ordination is poor.

PHENYLKETONURIA

- Gutherie inhibition assay is the screening test using a bacteriological procedure to detect phenylalanine in blood.
- A low PKU diet does not reverse intellectual disability in untreated older children but can decrease irritability and abnormal EEG changes.
- It increases social responsiveness and attention span.

OTHER GENETIC CAUSES OF INTELLECTUAL DISABILITY

- **Neurofibromatosis**-Most common of the neurocutaneous syndromes caused by a single dominant gene, which may be inherited or be a new mutation.1 in every 5000 births. Mild intellectual disability occurs in 1/3rd of pts with this disease.
- **Tuberous Sclerosis-**Tuberous sclerosis is the second most common of the neurocutaneous syndromes; a progressive mental retardation occurs in up to two thirds of all affected persons. 1 in every 15,000 births. Intellectual Disability occurs in about 2/3rd of the pts with this disease.
- **Lesch-Nyhan Syndrome-** Caused by a deficiency of an enzyme involved in purine metabolism. Patients have mental retardation, microcephaly, seizures, choreoathetosis, and spasticity

OTHER GENETIC CAUSES OF INTELLECTUAL DISABILITY

- **Adenoleukodystrophy**-characterized by diffuse demyelination of the cerebral white matter resulting in visual and intellectual impairment, seizures, spasticity, and progression to death.
- Clinical onset is generally between 5 and 8 years of age, with early seizures, disturbances in gait, and mild intellectual impairment.
- Abnormal pigmentation reflecting adrenal insufficiency sometimes precedes the neurological symptoms, and attacks of crying are common. Spastic contractures, ataxia, and swallowing disturbances are also frequent.

OTHER GENETIC CAUSES OF INTELLECTUAL DISABILITY

- **Maple Syrup Urine disease-** Survivors of this disease have severe intellectual disability. Some variants have transient ataxia and only mild intellectual disability.

ACQUIRED AND DEVELOPMENTAL FACTORS

Prenatal period-

- **Rubella-** It is the major cause of congenital malformations and intellectual disability caused by maternal infections. When mother is infected in the 1st trimester, 10-15% of the children are affected, but it is upto 50% when the infection occurs in 1st month. Maternal Rubella can be prevented by immunization.

ACQUIRED AND DEVELOPMENTAL FACTORS

Cytomegalic Inclusion Disease- Children with intellectual disability with this disease have cerebral calcification, microcephaly, or hydrocephalus.

× **Syphilis-** Syphilis in pregnant women was once the main cause of various neuropathological changes in their offspring, including mental retardation.

ACQUIRED AND DEVELOPMENTAL FACTORS

- **Toxoplsmosis-** Toxoplasmosis can be transmitted by the mother to the fetus. It causes mild or severe mental retardation and, in severe cases, hydrocephalus, seizures, microcephaly, and chorioretinitis

- **Herpes simplex-** The herpes simplex virus can be transmitted transplacentally, although the most common mode of infection is during birth. Microcephaly, mental retardation, intracranial calcification, and ocular abnormalities may result

ACQUIRED AND DEVELOPMENTAL FACTORS

- **Human Immunodeficiency Virus(HIV)**- A subset of infant born infected with HIV may develop progressive encephalopathy, intellectual disabilities and seizures within 1st years of life.
- **Fetal alcohol syndrome-** It results from prenatal alcohol exposure. FAS in US occurs in 0.2-1.5 per 1000 live births. It is one of the leading preventable causes of intellectual disability.

ACQUIRED AND DEVELOPMENTAL FACTORS

- **Prenatal drug exposure-** Exposure to opioids. Withdrawal symptoms appear within 2 days of life. Symptoms include irritability,hypertonia,tremor, vomiting. Seizures are unusual. Diazepam, phenobarbital,chlorpromazine have been used to treat neonatal opioid withdrawals.

ACQUIRED AND DEVELOPMENTAL FACTORS

- **Complications of Pregnancy-** Toxemia of pregnancy and uncontrolled maternal diabetes can potentially result in intellectual disability.
- **Perinatal period-** Premature and low birth wt individuals are at high risk for intellectual impairment.

ACQUIRED CHILDHOOD DISORDER

- **Infection**- The most common infections causing intellectual disabilities are meningitis and encephalitis.
- Head trauma
- **Asphyxia**- Brain damage due to asphyxia is common cause of intellectual disability.
- Long-term exposure- Long-term exposure to lead can cause intellectual disability.

ENVIRONMENTAL AND SOCIO-CULTURAL FACTORS

- Mild ID is associated with deprivation of nutrition.
- Prenatal environment compromised of poor medical care and poor maternal nutrition may cause mild intellectual disability.
- Teenage pregnancies are at risk for ID due to increased risk of obstetrical complications.
- Poor postnatal medical care, malnutrition, exposure to toxic substances such as lead and potential physical trauma are additional risk factors for mild ID.

COMMON COMORBID PSYCHIATRIC DISORDERS

- Intellectual disability is a significant risk factor for psychopathology in general.
- Psychiatric disorders are three to four times higher in people with an ID diagnosis than in the general population.
- The prevalence of psychiatric disorders in individuals with id is estimated to be between 30% and 60%

COMMON COMORBID PSYCHIATRIC DISORDERS

- **Schizophrenia –**
- Prevalence 1%
- If IQ <45 it is difficult to diagnose schizophrenia, In these cases the diagnosis of psychosis NOS should be considered .
- Some individuals display presumptive evidence of response to hallucinations (e.g., striking or shouting at empty space, throwing imaginary peers from furniture) or adopt catatonic postures that can appear to be psychotic in origin.
- Some of the symptoms of underlying brain damage such as stereotyped movements ands social withdrawal may wrongly suggest schizophrenia.
- It is always necessary to compare behavior before and after the onset of suspected psychiatric disorder.

COMMON COMORBID PSYCHIATRIC DISORDERS

Mood disorder-

- **D**epression- diagnosis has to be made mainly on appearance of sadness,changes in appetite and sleep, and behavioral changes of retardation or agitation.
- Mania- has to be diagnosed mainly from over activity and behavioral signs of excitement, irritability, or nervousness.

COMMON COMORBID PSYCHIATRIC DISORDERS

Anxiety disorder-

- Frequent at the time of stress,
- Post traumatic stress disorder have been reported in people with ID who have suffered physical or sexual abuse.
- Common symptoms of anxiety in the population with intellectual disability include aggression, agitation, compulsive or repetitive behaviors, self-injury, and insomnia. Panic may be expressed as agitation, screaming, crying

COMMON COMORBID PSYCHIATRIC DISORDERS

- **Eating Disorders-** Pica is perhaps the most common eating disorder among persons with intellectual disability. Over eating and obesity are features of prader-willi syndrome.

- **Dementia-** Adult with down syndrome are more likely to develop dementia than general population.

COMMON COMORBID PSYCHIATRIC DISORDERS

Attention-deficit/hyperactivity disorder-

- The rates of ADHD in individuals with intellectual disability are estimated to be between 9 and 18 percent.
- Diagnosis of ADHD is based on developmental considerations, namely, hyperactivity, impulsivity, and inattention significantly greater than that expected for a given developmental age, and thus the threshold for diagnosis in persons with severe to profound intellectual disability should be elevated.

COMMON COMORBID PSYCHIATRIC DISORDERS

Oppositional defiant disorder/conduct disorder-

- Affect about 30 per cent of young people with mild/borderline intellectual disability, more in males.
- Not applicable in non-verbal children with a more severe level of ID.

Tic disorders-

- It difficult in persons with profound intellectual disability. Frequently, these individuals display stereotyped or other movements, and it is difficult to discriminate intentional from unintentional movements or sounds or to distinguish vocal tics from spontaneous, stereotyped, or echolalic vocalizations in individuals who are frequently incapable of functional speech. The diagnosis of stereotyped movement disorder might be considered in such circumstances.

DIAGNOSIS

- History collection from parents and caretakers.
- Psychiatric interview.
- Structured Instruments, Rating Scales and Psychological Assessment
- Physical examination
- Neurological examination- sensory impairments occur frequently among persons with intellectual disabilities

PSYCHOLOGICAL ASSESSMENT

The intellectual functioning and adaptive behavior in a mentally retarded are assessed using a combination of test and schedules. The important are:

a) Measurement of the overall level of general intellectual functioning (IQ)

b) Assessment of adaptive behavior

c) Developmental assessment(DQ)

PSYCHOLOGICAL ASSESSMENT

- **Goodenough Draw-a-Person Test**
- **Kohs Block Test**, and **Geometric puzzles** all may be used as quick screening tests of visual-motor coordination.
- **Gesell and Bayley scales**
- **Cattell Infant Intelligence** Scale are most commonly used with infants.
- For children, the **Stanford-Binet Intelligence Scale** and the third edition of the **Wechsler Intelligence Scale for Children (WISC-III)** are those most widely used .
- The tests often found useful in detecting brain damage are the **Bender Gestalt Test** and the **Benton Visual Retention Test** .

LABORATORY EXAMINATION

- It include chromosomal analysis
- Urine and blood testing for metabolic disorders,
- Neuroimaging
- Chromosomal abnormalities are the single most common cause of mental retardation found in individuals for whom a cause can be identified.

LABORATORY EXAMINATION

- **Chromosomal studies-** current techniques are able to find chromosomal regions with specific FISH markers, leading to microscopic deletions being identified in up to 70% of persons with moderate to severe intellectual disability.
- Amniocentesis in which small amount of fluid is removed from amniotic cavity transabdominally at about 15 weeks of gestation is useful in diagnosing pre-natal chromosomal abnormalities

LABORATORY EXAMINATION

- Urine and blood analysis- Lesch-nyhan syndrome, Galactosaemia PKU can be identified through assays of the appropriate enzyme or amino-acids
- EEG- is indicated whenever a seizure disorder is considered
- CT scan or MRI- in patients with microcephaly, cerebral palsy and profound disability and in Tuberous screlosis
- Thyroid function tests- when cretinism is suspected

TREATMENT

- Based on an assessment of social, educational, psychiatric and environmental needs.
- The optimal approach includes primary, secondary and tertiary interventions

PRIMARY PREVENTION

- It comprises actions taken to eliminate or reduce the conditions that lead to intellectual disability. eg screening babies for PKU.
- Additional steps include education of general public about strategies to prevent intellectual disabilities such as abstinence of alcohol during pregnancy.
- Family and genetic counseling helps reduce the incidence of intellectual disability in a family with history of a genetic disorder.

SECONDARY AND TERTIARY PREVENTION

- Prompt attention to medical and psychiatric complications of intellectual disability can diminish the course (secondary prevention) and minimize the sequelae or consequent disabilities (tertiary prevention).
- Hereditary metabolic and endocrine disorders like PKU and congenital Hypothyroidism can be treated in early stage by dietary control or hormone replacement therapy.

PARENTS COUNSELLING

Following points are noteworthy in this contest (Madhavan,1990).

- The child's actual condition should be explained in simple words to the parents.
- Enough time must be taken while counseling.
- Misleading, giving false information or building false hopes in parents must be avoided.
- Information regarding professional help for treating associated conditions like seizures, hyperactivity, psychosis etc. must be made available to the parents.
- Attitude such over protection ie., doing everything for the child and shielding them from any challenging situation, should be corrected as it hinders the development of whatever capacities the child may have.

PARENTS COUNSELLING

- The attitude of rejection, that is ignoring the child thinking that he is good for nothing should be changed so that the child can be helped to learn by systematic training.
- The parents should be made aware of what they may expect of their child
- Some parents suffer from guilt feeling assuming that they are responsible for their child's condition. It should be explained that the condition is due to causes over which parents have no direct control.
- The counselor should explain the effectiveness and role of the parents and other family members in training a mentally retarded.

PARENTS COUNSELLING

- Some parents believe that training a mentally retarded child needs specialized skills and they may not be able to train their child. Parents should be explained that training a mentally retarded child does not need complex skills and repeated training in simple steps, they can be taught.
- Parents should be helped to learn the skills in training through demonstrations and observations.

PHARMACOTHERAPY

- **Antidepressants-** Cardiac anomalies are common in some intellectual disability syndromes, and the anticholinergic side effects of some medications may be particularly significant in persons with down syndrome; due to lowering seizure threshold, clomipramine is generally not a first-line treatment for compulsive behaviour.

- **Anticonvulsants**- Carbamazepine and valproic acid have been used clinically for aggressive behavior in children and adolescents. Persons with PWS treated with the anticonvulsant topiramate, whose skin-picking behavior improved.

- **Mood stabilizer** -Lithium has shown to be effective in reducing outbursts of aggression, particularly where there is irritability and explosiveness.

PHARMACOTHERAPY

- **Antipsychotics-** Greater risk of developing tardive dyskinesia than the general population. Considerable evidence of effectiveness of **RISPERIDONE** in treating severe disruptive behavior in children and adolescents with cognitive disability.

- Trials have found that at daily doses ranging from **.02 to .06 mg/kg**, children and adolescents with various disruptive behavior disorders, the majority of whom also had attention deficit hyperactivity disorder, improved significantly.

- **Psychostimulants-**Despite reports of paradoxical responses to stimulant medications in persons with intellectual disability, with higher-than-expected rates of emergent motor tics and emotional lability, a growing body of literature supports the use of stimulant drugs for the treatment of ADHD in the context of intellectual disability.

PHARMACOTHERAPY

- **Opioid Antagonists-** Naltrexone is the opioid antagonist most widely used for SIB, but the literature is mixed. Typical daily doses range from .5 to 2.0 mg/kg in children and up to 200 mg in adults.
- **Nootropics-** Drugs that positively affect cognition. Lobaugh and colleagues recently reported the first controlled trial of **Piracetam** in children with down syndrome.Piracetam was associated with a number of side effects, including aggression, agitation, sexual arousal, poor sleep, and diminished appetite. There were no consistent benefits of Piracetam over placebo identifiable in this study.

CONCLUSION

- Although the underlying intellectual impairment does not improve,
- In most cases of intellectual disability, level of adaptation increases with age and can be influenced positively by an enriched and supportive environment.
- In general, persons with mild and moderate mental intellectual disabilities have the most flexibility in adapting to various environmental conditions.
- Comorbid psychiatric disorders negatively impact overall prognosis. When psychiatric disorders are superimposed on intellectual disability, standard treatments for the comorbid mental disorders are often beneficial
- However, less robust responses and increased vulnerability to side effects of psychopharmacologic agents are often the case.

REFERENCES

- Kaplan & sadock’s comprehensive textbook of psychiatry, 9th edition
- Kaplan & sadock's synopsis of psychiatry
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4040055/
- ICD 10
- (DSM5)Diagnostic and Statistical Manual of Mental Disorders

THANK YOU