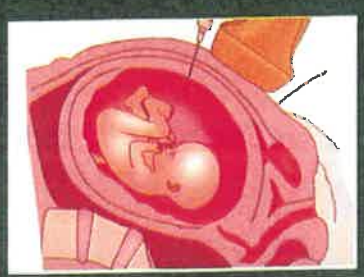
Cerebellum
Get the balance right

Cerebellum Pediatrics

For the Students
By the Teachers



Cerebellum

Get the balance right

Table of Content

List of Topics NOT SO IMPORTANT for FMGE-Aspirants

1. Growth & Development: Part 1 to part 5 (Case Presentation)
2. Neonatology Part 16- KMC, Part 17 - IVH
3. Cardiology - Part 11
4. CNS - Part 1 and 2 (Case Presentation)
5. Hematology Part 9
6. GIT / Hepatology Part 5 Hyponatremia
7. IEM - Part 8 Organic Acedemias

Section 1

Growth & Development

1.1 Chapter

CASE PRESENTATION

"Push yourself, because no one else is going to do it for you"

NORMAL & ABNORMAL GROWTH

How to approach?

- Name = important for Record, Documentation & confidence. Also, we can assume religion & eating habits e.g. Neurocystycercosis due to uncooked pork or beef.
- Age = for ex. 5-15-year-old suspect Rheumatic fever, 6 months onward pt. has come with multiple transfusions suspect sickle cell anemia & thalassemia. 5 years or younger may present with any kind of deficiency. Newborn has come with repeated infection or cyanosis suspect CCHD (MC=VSD). CCHD are TOF, TGA, Tricuspid atresia, Truncus arteriosus, TAPVC.
- Sex
- Address
- Informant

1.2 Chapter

CASE PRESENTATION

- **Age:**
  - The 1-day old baby came with cyanosis – suspect TGA
  - 4-6 weeks old baby came with some heart disease – suspect VSD (most common congenital heart)
  - 1-month old baby came with cyanosis – suspect TOF
  - 1-year-old baby came with some heart disease – suspect ASD (most common congenital heart)
- **Sex:**
  - Left to right shunt are more common in females.
  - Example of some left to right shunts are ASD, VSD, PDA
  - SAM is also more common in Females
  - Rickets is also more common in Females (spend less time outside)
- Syndrome important in Females = Turner syndrome, RETT syndrome
- Syndrome important in Males = Klinefelter syndrome (47 XXY), Fragile X syndrome
- 1st & 2nd most common non-preventable cause of mental retardation = Down syndrome followed by Fragile X syndrome
  - Color blindness is also more common in males
  - Hemophilia/DMD is also more common in males
  - Hurler (MPS 1)/hunter (MPS 2) is also more common in males
- **Address** = this information will help us to rule the disease of hilly area & goiter endemic area.
- **Informant** = is the person who presents the history on behalf of the child, mostly mother & she is reliable, who stays with the child 24 x 7

1.3 Chapter

CASE PRESENTATION

Presenting complaints:

- If patient come with Fever for 10 days, Cough since 7 days, breathing difficulty since 5 days = we will suspect LRTI, Pneumonia, Asthma
- For H/O presenting illness ask Leading questions = follow 'OPD' (Onset, progress, duration)
- Onset = example, Pt. had convulsions which was more in the morning suspect Glycogen storage disease
- Pt. had breathlessness which was more in the night time suspect PND

Onset:

- Acute: Wet beri beri (def. of thiamine). Involves her causing CNP / Cardiomegaly
- Subacute: Dry beri beri/CNS causing Neuropathy
- Insidious: nephrotic syndrome
- Chronic: TB

Progress:

- Better: thromboembolic manifest
- Worse: degenerative disorder
- Static: Cerebral palsy

Duration:

- Enteric fever >1 week
- Diarrhea/dysentery/tenesmus/hematochezia/ melena
- Demarcation point is ligament of treitz
- Diarrhea: MC viral/overall cause = Rotavirus
- Diarrhea: MC bacterial cause = E. coli
- IBD: long duration

Also include Fever

1.4 Chapter

CASE PRESENTATION

"Keep chasing your dreams weather you are tired or frustrated"

Duration of fever:

- Short duration = Viral fever
- Long duration fever = TB/enteric fever/ malaria/granulomatous disease

Rise of fever:

- Abrupt onset: Malaria /UTI/Pneumonia
- Gradual Onset: typhoid fever

Types:

- Type of fever
  - Continuous
  - Intermittent
  - Pemittent
  - Saddle bock fever
  - Pel ebstein fever
    - Continuous = always above the baseline & does not fluctuate more than 1 degree Celsius. Ex: Viral fever /Typhoid / UTI / brucellosis
    - Intermittent = temp. fluctuation is >1 degree Celsius and it touches the baseline also. Ex: malaria/kala azar/empyema/ septicemia/filarial fever
    - Remittent = always above the baseline. Temp. fluctuation > 2 degree Celsius. Ex: enteric/Infective endocarditis
    - Saddleback = alternative febrile and afebrile period of 2-3 days each. Ex: Dengue fever
    - Pel ebstein bar = alternative febrile and afebrile period of 3-10 days each. Ex: Hodgkin's Lymphoma
    - Undulant fever = fever is like a wave
    - Tertian = Every 48 hrs
    - Quartan = Every 72 hrs

      Undulant Fever Brucellosis

      Tertian (3rd) P.vilax

      Suartan (4th) P. malariae

- Chills & Rigor:
  - Chills is feeling of cold
  - Rigor: shivering
  - Ex: Malaria/UTI/tonsillitis/filaria
- Fever with altered sensorium - suspect Meningitis
- Fever with Convulsions - suspect CNS infection.

1.5 Chapter

CASE PRESENTATION

Important aspects of Past History:

- CVS causes:
  - Acute rheumatic fever
  - Cyanotic spells
- GIT:
  - Past history of jaundice/blood transfusions
  - Infective hepatitis
  - Chronic diarrhea
- CNS:
  - History of recent vaccination/ear discharge/ convulsions

- **History of contact:**
  - If any person is in contact with the pt. who is an open case of TB and on rx or has completed rx within 2 years of life
  - History of contact on the basis of hours
  - Person who has shared an air space with a person having TB in household or any other indoor setting for > 15 hrs per week or > 180 hours total during an infectious period than consider than person as a contact positive

- **Antenatal history:**

Ask her about

- Diabetes Mellitus/IDM dis.
- Weight of baby
- Hairy pinna
- Hyperglycemic mother & hypoglycemic baby
- Baby of mother with Pregnancy induced HTN can have IUGR/thrombocytopenia/Premature delivery
- Baby of mother with SLE can have heart block/ spontaneous abortion/lupus syndrome
- Baby of mother with UTI can have Preterm delivery
- Baby of mother with hyperparathyroidism can have Tetany
- Baby of mother with PKU can have Microcephaly/ heart defect
- Baby of mother with H/O alcohol consumption can have fetal alcohol syndrome
  - Short palpebral fissure
  - Smooth philtrum
  - Microcephaly
  - Thin upper lip
    - 500 millirads of radiation is allowed in entire pregnancy period

- **Trimester history:**

1. Radiations & viral infection (TORCH infection & congenital rubella infection)
2. there is inc. in size and no. of cells
3. only inc. in size of fetal cells

This is phocomelia due to Thalidomide

- Anti-malarial – deafness
- Alcohol – fetal alcohol syndrome/limb abn.
- Carbamazepine – spina bifida
- Carbimazole – scalp defects, choanal atresia, esophageal atresia
- Cocaine – microcephaly, LBW, IUGR
- Danazol – virilization
- Lithium – Ebstein anomaly, macrosomia
- Misoprostol – Mobius syndrome – cranial neuropathies
- Phenytoin – fetal hydantoin syndrome, neuroblastoma, bleeding (vit. K def.)
- Quinine – abortion, thrombocytopenia, deafness
- **Statins – VACTERL anomalies**
  - V: vertebral anomalies
  - A: anal atresia
  - C: cardiac anomalies
  - T: trachea esophageal anomalies
  - E: esophageal
  - R: Renal/radial anomalies
  - L: limb anomalies
- Tetracyclines – teeth pigmentation, cataract
- Vitamin D – Supravalvular aortic stenosis
- Warfarin – fetal bleeding, hypoplastic nasal strs.
- **Birth history:**
  - Birth order: why do u want to know that it's her 3rd baby? Because in Indian scenario, this baby can lead to malnutrition
  - If 2 deliveries in < 2 years, in India, this baby can lead to malnutrition
  - Twin preg. or not? Because 2nd twin will always have some insult. It will depend on:
    - MOD
    - Time/place of delivery
    - Who conducted – dai or doctor
    - Term/preterm – Why preterm is imp. – PDA

1.6 Chapter

IMPORTANT DATES, DEFINITION, ANTHROPOMETRY, LEGAL AGE DEFINITION

"Stay positive, staying negative will not help"

Important dates:

- World Doctors Day - 1st July
- World Malaria Day - 25th April
- World Rabies Day - 28th Sept
- World Autism Day - 2nd April
- Autistic Pride Day - 18th June
- Children's Day - 14th November
- Breastfeeding Week - August 1st Week
- World No Tobacco Day - 31st May
- World Environment Day - 5th JUNE
- National Neonatology Week - 15th-21st Nov

What Is Pediatrics?

- Pedo = child, iatros = healer
- Age group: 0-18 yrs
- Modern concept of pediatrics means Continuous and preventive care of whole child *

Periods Of Growth:

- Ovum/zygote: 0-2 weeks
- Embryo: 3-8 weeks
- Fetus: 8w-birth
- Perinatal period: 22-7 days after birth
- Neonate: 0-28 days of life
- Early neonate: 0-7 days
- Late neonate: 7-28 days
- Infant: 29 days till 1 year
- Toddler: 1-3
- Preschool: 3-6
- **School: 6-12**

Adolescence:

- **Early: 10-13**
- **Middle: 14-16**
- **Late: 17-20**

Anthropometry

- Normal weight: 2.5-4kg
- Average Indian baby wt.: 3kg
- Normal length: 48-50cm (inc. by 50% at 1st yr. = 75cm)
- Normal HC: 33-35cm
- Normal CC: 31cm (-3), HC = CC by 9-12months
- CC is measured at the level of:
  - Nipples in mid inspiration
  - 2 yrs: standing position
  - < 2 yrs: lying position
    - 2kg/year for next 7 years
    - After 7 years: 3kg/year
- **Legal age**

Legal age definitions	
Definition of child	< 18 years
Minimum age of marriage	B <21 yrs, G <18 yrs
Responsibility of crime	12 yrs
Juvenile Criminal	12-18 yrs
Compulsory free education	6-14 yrs

- Expected weight formula = Weech's Formula
  - 3m - 12 months: 9 + x/2
  - 1-6 year: 2x + 8
  - 7-12 year: 7 x -5/2
- Expected height formula = age x 6 + 77 (for 2-12 yr)
- Weight doubles at = 5 month
- Weight triples at = 1 year
- Height doubles at = 4 years

AGE	
5 months	Weight doubles of birth weight
1 yr.	Triples
2	4 times
3	5 times****
5	6 times
7	7 times
10	10 times

- Newborn baby with weight of 2540 grams at birth come on Day 5 with weight of 2240 grams
- How to proceed? Just do conservative management because Term newborn loses 10 % of its birth weight in 3-5 days and regained by 10th day of life
- Length increases by 50% In the 1st year of life

Normal Growth Instruments

- Length: Infantometer <2 yr
- Height: Stadiometer > 2 yr
- HC: non-stretchable measuring tape
- Skin fold thickness: Harpenden Calipers
- Height
  - At birth: 50cm
  - 3 months: 60 cm
  - 6 months: 65cm
  - 9 months: 70cm

- 1 yr: 75cm*
- 2 yr: 90cm
- 4 yr: 100cm *
- 12 yr: 150 cm
- Formula: age x 6 + 77
- 5 & 4: weight doubles at 5 months, ht. by 4 year
- Total gain in 1st year is 25 cm
- Half of that means 12.5 cm will be the gain in 2nd year.
- Beyond 2 years a child gains about 6 cm per year.

After 4 years the child gains 6cm/ year height every year till 12 years.

Always measure height in Frankfort plane only

- Orbito tragion line
- Lower margin of the orbit
- External auditory meatus

1.7 Chapter

HEAD CIRCUMFERENCE

- Max. increase in height occurs in 1st yr. * followed by puberty *
- After 4 years, the child gains 6cm/year height every year till 12 years.
- During 6-11 yrs, weight averages 3-3.5kg/yr* and height 6-7 cm/yr.
- Upper segment: lower segment ratio
  - Upper segment = Vertex to pubic symphysis
  - Lower segment = Pubic symphysis to heel
  - Normal US:LS ratio at birth = 1.7:1
  - 3 years: 1.3:1
  - 7-10 years: 1:1

Head Circumference

- Normal head circumference = 33-35cm

0-3 months	2cm/month
3-6 months	1 cm/ month
7-12 months	0.5 cm/ month
1-3 yr	0.2/month

- Measurer by putting Non-stretchable tape over Occipital protuberance to supraorbital ridge.
- Repeat it thrice.
- Microcephaly <-3 SD* below the mean for age & sex
- Macrocephaly: >2SD*, >95th percentile

Age	HC
Birth	34-35
2 months	38
3 months	40
4 months	41
6 months	42-43
1 yr	45-46
2 yr	47-48

- Squint
- Low set ears
- Macrocephaly

Due to hydrocephalus Macrocephaly

- Growth of a child is cephalocaudal and distal to proximal
- During fetal life, head grows before the neck
- Distal parts of the body such as hands increase in size before the upper arms.

1.8 Chapter

MICROCEPHALY VS MACROCEPHALY

CAUSES OF MICROCEPHALY

- Mnemonic = Rubin & Smith family crying for eating corn at pattaya beach
  - R: Rubinstein taybi syndrome
  - S: Smith Lemli Opitz syndrome
  - F: Familial
  - C: Cri du chat syndrome
  - E: Edward syndrome
  - C: Cornelia de Lange syndrome
  - P: Patau syndrome
- **Secondary Causes:** CMA
  - **Congenital infection:** Toxoplasmosis, CMV, Rubella,
- Maternal Causes:
  1. Alcohol*
  2. Smoking
  3. Phenytoin
  4. Radiation
  5. Phenylketonuria*

Acquired microcephaly:

1. RETT syndrome*
2. Angelman syndrome
3. Seckel syndrome

RETT syndrome

- Seen in females
- MECP 2 gene mutation
- Acquired Microcephaly
- Developmental regression
- HALLMARK: a period of normal development followed by regression
- Criteria for diagnosis: period of normal development 0-6 months
- Loss of purposeful hand movements (9 month-2yr)
- Gait dyspraxia (2-4yr) difficulty in activities requiring coordination and movement.
- **Variants:**
  1. Zappella variant
  2. Hanefeld variant
  3. Rolando variant
- **Stages of RETT syndrome:**

Early onset stagnation phase

Rapid destructive stage

Pseudo stationary stage

Late motor deterioration stage

- Hand wringing, child is initially normal and then there is regression
- Most common cause of death is Cardiac arrhythmia [torsade de pointes]
- Apraxia: difficult to do motor movements

Macrocephaly

- Causes: ARO Saves My Health
  - A: Anemia (chronic)
  - R: Rickets
  - O: Osteogenesis imperfecta
  - S: subdural hematoma
  - M: Megalencephaly
  - H: Hydranencephaly
  - H: Hydrocephalus.