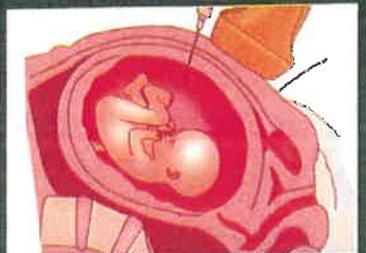




Cerebellum
Get the balance right

Cerebellum Pediatrics

For the Students
By the Teachers





Cerebellum

Get the balance right



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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. Neurocystercosis 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
- o **Continuous** = always above the baseline & does not fluctuate more than 1 degree Celsius. Ex: Viral fever /Typhoid / UTI / brucellosis
- o **Intermittent** = temp. fluctuation is >1 degree Celsius and it touches the baseline also. Ex: malaria/kala azar/empyema/septicemia/filarial fever

- o **Remittent** = always above the baseline. Temp. fluctuation > 2 degree Celsius. Ex: enteric/Infective endocarditis
- o **Saddleback** = alternative febrile and afebrile period of 2-3 days each. Ex: Dengue fever
- o **Pel ebstein bar** = alternative febrile and afebrile period of 3-10 days each. Ex: Hodgkin's Lymphoma
- o **Undulant fever** = fever is like a wave
- o **Tertian** = Every 48 hrs
- o **Quartan** = Every 72 hrs
- o **Undulant Fever** Brucellosis
- o **Tertian** (3rd) P. vivax
- o **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 str.
- **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: $7 \times -5/2$
- Expected height formula = $\text{age} \times 6 + 77$ (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

- 1 yr: 75cm*
- 2 yr: 90cm
- 4 yr: 100cm *
- 12 yr: 150 cm
- Formula: $\text{age} \times 6 + 77$
- 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.

- 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

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

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

1.7

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

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

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

- Measured 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



- 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.