Dr. Feri's Notes

PEDIATRICS

The perfect handbook for undergraduates

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PREFACE:

Hello friends, the book that you hold in your hands now is the fruit of my humble effort to compile the notes I've used during my final year university preparation. It covers previous years' questions and all the topics necessary to come out of the examination hall with flying colours.

In fact, if used appropriately, I can confidently say that this is the only guidebook you need to use from an examination point of view when you have limited time to refer or deeply immerse yourself in a particular topic. All the information included has been thoroughly cross-checked & verified from various standard sources and hence can be relied on. However, if any mistake is found out, I'll make sure it'll be rectified in the next editions.

All the best for your learning journey with Dr. Feri's Notes...!

1. GROWTH:

(from page 6)

PYQs:
1. Ponderal index.
2. Growth assessment & development in 1 yr old child.
3. Weight gain in 1st yr of life.
4. Age-independent growth parameters.
5. Microcephaly.
6. Rates of growth of different tissues.
7. FTT & its management.
8. Short stature.
9. Growth chart.

Potential questions:
1. Macrocephaly.
2. Hyperphagic short stature.

SAM (SEVERE ACUTE MALNUTRITION):

(from pages 22-27)

Criteria:
1. Symmetrical bipedal edema of nutritional origin.
2. MUAC <11.5cm (6m-59m).
3. Severe wasting <-3SD.

Types of SAM:
1. Kwashiorkar.
2. Marasmus.
3. Marasmic kwashiorkor (edematous undernutrition: underweight + edema).

KWASHIORKAR:

Pathogenesis:
- ELFS (early lactational failure syndrome).
- Protein deficiency without carbohydrate deficiency.
- Maladaptive or decompensated PEM.
- Visceral protein loss.
- Low serum albumin level.
- Poor prognosis.

Clinical features:
PEMG:
1. **P**sychiatric:
   - Mental changes.

- Apathy.
- Lethargy.
- Crying without reason.
- Irritability.

2. **E**dema.
3. **M**uscle wasting.
4. **G**rowth retardation.
5. Flag sign: alternate pigmented & depigmented hair.
6. Flaky paint/crazy pavement dermatitis/dermatosis:
    - Skin rash/hyperpigmented patches.
7. Pot belly.
8. Hepatomegaly.
9. Poor appetite.
10. 1-4 yrs.
11. Early weaning as trigger factor.
12. Skin changes:
    - Increased pigmentation.
    - Desquamation.
    - Dyspigmentation.
    - Ulcers, burns-like lesions.
    - Individual enamel spots.
    - Skin peels off.
    - Abdominal petechiae.
14. Mucus membrane lesions:
    - Cheilosis.
    - Angular stomatitis.
    - HSV stomatitis.
    - Smooth tongue.
15. Renal function: aminoaciduria.

Grading of kwashiorkar:
Grade 1: pedal edema.
Grade 2: facial edema.
Grade 3: chest & body edema.
Grade 4: ascites.

MARASMUS:

Pathogenesis:
- Adaptive or compensated PEM (protein energy malnutrition).
- Somatic protein loss.
- Both carb + protein loss.
- Low serum insulin: fat & protein breakdown.
- Good prognosis.

Clinical features:
2. Flesh & bones baby.
3. No hair (alopecia).
4. Voracious appetite, alert child.
5. Wrinkled monkey facies.
6. Old man appearance.
7. Baggy pants (loss of gluteal fat)
8. <1 yr.
9. No trigger factors.
10. Visible wasting/prominent ribs.

Grading of marasmus:
Grade 1: loose skin folds in axilla & groin.
Grade 2: wasting of thigh & buttocks.
Grade 3: wasting of chest & back.

Grade 4: wasting of buccal pad of fat.

Management of SAM:

A. Mild & moderate malnutrition:

- 7 times/d feeding.
- 150kcal/kg/d.
- 3g/kg/d protein.

B. **Uncomplicated SAM:**

- Supervised home management.

1. Nutrition therapy:
   - Energy-dense, vitamin & mineral-enriched, easily eatable & digestible food.
   - Made with peanut paste, sugar, milk solid, vegetable oil.
   - 6-8 times/d feeding.
   - 175kcal/kg/d.
2. Sensory stimulation:
   - Play.
   - Physical activity.
   - Interaction.
3. Supervision & support:
   - Peer counselor to support family.
   - Home visits initially daily, then twice wkly by health workers.
4. Monitoring by health workers (ASHA, ANM, AWW).
5. Other treatments:
   - Albendazole single dose >2 yrs.
   - Oral amoxicillin for 5ds.
   - 1 lakh units mega dose vit A.
   - RUTF: ready to use therapeutic fluid.
   - Vaccination.

C. **Complicated SAM:**

- Medical complications + poor appetite + anasarca/severe edema + 1 or more danger signs as per IMNCI.
- Hospital management.
- Total duration of treatment = 6 wks.
- 1st wk (stabilisation phase): initial restoration of homeostasis + treating medical complications.
- 2-6 wks (rehabilitation phase): rebuilding wasted tissues & may take several wks.
- Complete nutritional rehabilitation: 3-5m.
- Hospitalisation optimal for : 6-8 wks.

Correction of:

1. Dehydration.
2. Hypothermia.
3. Hypoglycemia.
4. Infections.

5. Electrolytes:
   - Hypokalemia.
   - Hypomagnesemia.
   - Hypernatremia.
6. Micronutrient deficiency:
   - Give twice RDA.
   - Micronutrient never given in 1st wk of SAM mx: oral F. Because of:
   - Fenton reaction: free radical damage.
   - Malnutrition + infections reduce Fe absorption.
7. Sensory stimulation:
   - Age-appropriate structured play for at least 15-30mins/d.
   - Age-appropriate physical activity.
   - Love & care.

Dehydration in SAM:

- Resomal (ORS: rehydration solution for malnutrition).
- 45mOsmol/l Na+ & 40mOsmol/l K+.
- No shock -> oral fluids for 12hrs.
- Shock (cold, clammy skin) -> RL in 5% dextrose IV fluid or 10ml/kg NS as IV bolus.

Signs of overhydration:

- RR increases by 5/min.
- PR increases by 15/min.

Total 24hrs fluid:

- No edema -> 130ml/kg/d.
- Edema present -> 100ml/kg/d.

Hypothermia in SAM:

- Rectal temperature <35.5 degrees or axillary temperature <35 degrees.
- Immediately breastfeed & clothe child with warm clothes.
- Skin contact & overhead warmer for heat.
- Apt antibiotics for sepsis.

Hypoglycemia in complicated SAM:

A. **Symptomatic hypoglycemia:**

- Blood glucose <54mg%.
- Give 5ml/kg 10% dextrose IV.
- Then 50ml 10% dextrose via NGT.
- Glucose checked every 30mins.

B. **Asymptomatic hypoglycemia:**

- Give 50ml 10% glucose.
- Then start 2hrly feeding regimen with F-75 day & night.

Infections in SAM:

- For all from day 1 -> broad-spectrum antibiotics: oral amoxicillin or cotrimoxazole.
- If infection -> IV ampicillin + gentamicin × 7ds + oral amoxicillin × 5ds.
- Skin infection -> + cloxacillin.
- Septic shock/meningitis -> + 3rd generation cephalosporin.

Initial feeding:

- Initiate as early as possible.
- If unable to take orally -> give via NG tube.
- Continue breastfeeding.
- Start with F-75 feed every 2hrly.
- Persistent diarrhea -> give cereal-based low lactose F-75 as starter diet.
- If diarrhea still persists -> give lactose-free F-75 diet (rarely needed).
- Cautious feeding recommended during 1st wk to prevent refeeding syndrome: very high calorie & protein foods -> high insulin levels -> hypokalemia + hypophosphatemia.

Types of feed:

1. F-75 (75 kcal in 100ml packet) formula:
   - 75 kcal + 0.9g proteins.
   - Given in stabilisation phase over 2-3hrs.

2. F-100 (100 kcal in 100ml packet):
   - 75 kcal + 2.5-3g proteins.
   - Given in rehabilitation phase.
   - Never give F-100 for <6 months child (dilute it with 30% water).

Catch-up growth:

- When appetite returns, increase intake.
- Seen beyond stabilisation phase.
- Gradually shift from F-75 to F-100 feed.
- Continue breastfeeding.

Monitoring of weight gain:

- >10g/kg/d -> good, continue same feeding.
- 5-10g -> screen for systemic infections + recheck food intake.
- <5g/kg/d -> relook feeding.

Follow-up:

1. Primary failure to respond:

- Failure to gain appetite by day 4.
- Failure to start losing edema by day 4.
- Failure to gain at least 5g/kg/d by day 10.
- Presence of edema on day 10.

2. Secondary failure to respond:
   - Failure to gain at least 5g/kg/d for consecutive days during rehabilitation phase.

Discharge criteria:

1. No edema for 2 wks.
2. MUAC at least 12.5cm.
3. Weight-for-height reached (2SD).

NOTE:

- POSHAN abhiyaan (Feb 2018): PM Overarching Scheme for Holistic Nutrition.

MENINGITIS:

(from pages 140-142)

Types:

1. Acute bacterial/pyogenic meningitis.
2. Tuberculous meningitis.
3. Viral meningitis.

Differential diagnoses of meningitis:

1. Bacterial meningitis.
2. Viral meningitis.
3. Fungal meningitis: cryptococcal.
4. Tubercular meningitis.
5. Other infections:
   - Leptospirosis.
   - Lyme disease.
   - Brucellosis.
   - Syphilis.
6. Parameningeal foci of infection:
   - Subdural empyema.
   - Brain abscess.
7. Brain tumor.
8. Subarachnoid hemorrhage.
9. CNS vasculitis.
10. Encephalitis.

ACUTE BACTERIAL MENINGITIS:

Etiology:

<2m:

- Gram negative bacteria.

- Group B streptococcus.
- Staphylococcus aureus.
- Listeria monocytogenes.

2m-2 yrs:

- Hemophilus influenza B.
- Pneumococcus.
- Meningococcus.

>2 yrs:

- Pneumococcus.
- Meningococcus.
- H. influenza B.

Clinical features:

1. Newborn & young infants:
   - Lethargy.
   - Seizures.
   - Poor feeding.
2. Older infants:
   - Fever.
   - Irritability.
   - Photophobia.
   - Tense bulging AF.
   - Meningeal signs (Kernig's sign & Brudzinski sign) (seen in >2 yrs old).
3. Older children:
   - Abrupt onset of high grade fever.
   - Anorexia.
   - Unrelenting headache.
   - Myalgia.
   - Photophobia.
   - Projectile vomiting.
   - Papilledema.
   - Altered sensorium or coma.
   - Neck stiffness & nuchal rigidity.
   - H/o unimmunisation.
4. Cushing's triad (due to high ICT) in late meningitis:
   - Respiratory depression.
   - Bradycardia.
   - Hypertension.

Diagnosis:

1. CSF analysis by LP (lumbar puncture):
   - Low sugar (<40% concomitant blood glucose): hypoglycorrhachia.
   - Raised protein.
   - Raised CSF pressure.
   - Turbid/purulent fluid.
   - Increased cells: 1000s of neutrophils (PMNL).
2. Gram staining.
3. Blood culture.

Treatment:

1. ICP high -> immediately start empirical antibiotics.
2. ICP normal -> do CSF study -> start empirical antibiotics:
   - 3rd generation cephalosporins.
   - If no clinical response within 1st 48-72hrs -> add vancomycin.
3. Steroids (dexamethasone):
   - To reduce SNHL.

- To reduce ICP.
- Short-term neurological sequelae.
- Inflammation.
- To increase penetrating power of drugs.

4. Seizures:
   - Midazolam.
   - Lorazepam.

TUBERCULOUS MENINGITIS:

- Most severe form.

Pathogenesis:

- Rich's focus/TB focus in brain (meningeal seeding in TB) ruptures -> tuberculous meningitis (basal thick exudates) + blocking of subarachnoid space -> obstructive hydrocephalus.

Clinical features:

1st stage (prodormal)**:**

- Fever.
- Irritability.
- Anorexia.

2nd stage (neurological)**:**

- Focal neurological deficits.
- Seizures.
- Meningeal signs.

3rd stage (coma)**:**

- GCS <11.
- Decerebrate rigidity or decorticate posturing.

Investigations:

1. CSF analysis:
   - Turbid/viscous appearance.
   - Increased CSF pressure.
   - Increased protein >100mg%.
   - Low sugar.
   - Lymphocytic predominance: 100s.
   - Cobweb coagulum: due to very high fibrinogen.
2. Neuroimaging:
   - Hydrocephalus.
   - Infarction.
   - Thick basal exudates.
3. Confirmatory test:
   - PCR or CSF culture +ve for M. tuberculi.

Treatment:

1. ATT (anti-tubercular therapy):
   - Total 12m: 2HRZE + 10HR.
2. Corticosteroids ×4 wks: only if associated with HIV.

VIRAL MENINGITIS:

- Most common etiology: JE in India.
- Most common worldwide: enterovirus.

Diagnosis:

1. CSF analysis:
   - Clear/turbid fluid.
   - Increased lymphocytes (10-300).

- mildly elevated or normal protein.
- Normal glucose.

2. IgM ELISA.

Treatment:

- Supportive only.

Normal CSF findings:

- Normal pressure: 50-180mm H20.
- Cells: 0-5 lymphocytes.
- Protein: 20-45 mg% (<50mg%).
- Glucose: 66% of blood sugar (40-60/70mg%).
- Clear appearance.