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RICKETS—'WRICKKEN'—TO TWIST

It is the failure in mineralization of growing bone or osteoid tissue.
FUNCTIONS OF VIT.D

- Facilitation of intestinal absorption of Ca & P

- Reabsorption of P in the kidneys and

- A direct effect on mineral metabolism of bone (deposition & reabsorption)

- In conjunction with parathormone and calcitonin, homeostasis of Ca & P in body fluids and tissues.
Vit. D deficiency

Decrease in serum calcium & phosphate

Lack of normal growth of epiphyseal cartilage & its calcification

Growth at distal end of epiphyseal plate continues

epiphyseal plate is enlarged & swollen due to accumulation of osteoid tissue

Wide irregular, frayed end of shaft of long bone is produced
Metabolism of Vit. D

Two forms of vitamin D are of practical importance. Vitamin D2, or **calciferol**, and Vitamin D3, (naturally present in human skin in the provitamin stage as 7-dehydrocholesterol.)

- activated photochemically
- Cholecalciferol
- hydroxylated in the liver
- 25-OH-cholecalciferol
- hydroxylated in the renal cortical cells
- 1, 25-dihydroxycholecalciferol,
- which functions as a hormone.
ETIOLOGICAL CLASSIFICATION

1. Nutritional rickets
2. Intestinal malabsorption
3. Hepatic rickets
4. Renal rickets
   * Chronic renal failure
   * Renal tubular acidosis
   * Fanconi’s syndrome
5. Hereditary
   * Hereditary type I Vit.D resistant rickets
   * Hereditary type II Vit.D dependant rickets
   * Familial X-linked hypophosphosphatemic rickets.
CLINICAL FEATURES

GENERAL
Failure to thrive, Listlessness
Protuding abdomen, Muscle weakness
Fractures

HYPOCALCEMIC SYMPTOMS
Tetany, Seizures
Stridor due to laryngeal spasm

HEAD
Craniotabes, Frontal bossing
Delayed fontanelle closure
Delayed dentition
CHEST
  Rachitic rosary, Harrison groove
  Respiratory infections and atelectasis

BACK
  Scoliosis, Kyphosis, Lordosis

EXTREMITIES
  Enlargement of wrists and ankles
  Valgus or varus deformities
  Bowing of Legs
Diagnosis:

**X-Ray wrist** - Fraying, flaring & Cupping of the epiphysis of long bones.

The serum Ca, P, Alk. Phosphatase.

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<tr>
<th>Serum Calcium</th>
<th>Serum phosphate</th>
<th>Serum alkaline phosphatase</th>
<th>Vit.D</th>
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DIFFERENTIAL DIAGNOSIS:

1. **Craniotabes** - hydrocephalus and OI

2. Enlargement of the costochondral junctions
   scurvy & chondrodystrophy.

3. **Other epiphyseal lesions**
   Blounts disease
   Renal osteodystrophy
PREVENTION:

*Exposure to ultraviolet light or oral Vit. D

*The daily requirement of Vit. D is 10 mg or 400 IU.

*Premature infants or breast-fed infants whose mothers are not exposed to adequate sunlight should receive supplemental vitamin D daily.

*Vitamin D should also be administered to pregnant & lactating mothers
TREATMENT:

1. **Inj. Vit.D3**- 6 Lakh units single dose

2. **Alpha Leo drops**
   (I, Alpha hydroxy cholecalciferol)--liver--
   I,25 dihydroxy cholecalciferol

   Drops-0.1ug(2ug/ml)
   Solution-0.2ug/ml
   Injection- 2ug/ml I/v
   Dose <20Kg -- 0.05ug/Kg/day
   >20Kg -- 1ug/day

Healing on X-ray within 2–4 wks
zone of preparatory calcification
COMPLICATIONS:

* Respiratory infections
* Anemia
* CPVD
PROGNOSIS:

Healing begins within a few days and progresses slowly until the normal bony structure is restored.

Rickets in itself is not a fatal disease, but complications and intercurrent infections such as pneumonia, tuberculosis, and enteritis are more likely to cause death of rachitic children.
THANK YOU
SOURCES OF VIT. D

Exposure to sunlight (ultraviolet light);
Fish oils, fatty fish,
Egg yolks, and
Vit. D–fortified formula, milk, cereals, and bread.
Hypervitaminosis D:

*Symptoms develop after 1-3 mo of large intakes of vitamin D.

*Symptoms include
  hypotonia, anorexia, irritability,
  constipation, polydipsia, polyuria, and pallor.
  Aortic valvular stenosis, vomiting, hypertension,
  retinopathy, & clouding of the cornea and conjunctiva may occur.

*Hypocalcemia and hypercalciuria are notable.

*The urine may show proteinuria.
  renal damage and metastatic calcification occur.

*X-ray of the long bones - metastatic calcification and generalized osteopetrosis.