METABOLC DISORDERS

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OSTEOPOROSIS

- Fully mineralised bone
- Abnormally porous structure
- Week to that age
- Abnormal diminution of bone mass per unit volume
- Increased fragility
- More resorption less formation leads to porous trabeculae
- Increased tendency to fractures

OSTEOPOROSIS

• PRIMARY-

age related gonadal

• SECANDARY-

metabolic neoplastic



7.10 Osteoporosis Fine-detail x-rays of iliac crest biopsies and femoral head slices, showing the contrast between trabecular density at the age of 40 (a, b) and aged 70 (c, d). No wonder old bones break easily.

PRIMARY OSTEOPOROSIS POSTMENOPAUSAL

• Physiological, age related change in bone mass and structure In case of severe changes condition becomes pathological

- Fractures can occur on minor trauma
- Women after menopause suffer from this disease

POSTMENOPAUASAL OSTEOPOROSIS

- Women after menopause loose 3% of bone mass every year as compared to 0.3% of pre menopausal period
- Increased resorption, oestrogen withdrawal Leeds to enhanced osteoclastic activity make bone porous and week
- Various contributary factors are heredity, premature menopause, early hysterectomy, cigarette smoking, alcoholism etc

POSTMENOPAUSAL OSTEOPOROSIS

Clinical features are back pain and increasing thoracic kyphosis

X-ray shows wedging of vertebras

Ground glass appearance of bones

Loss of trabecular pattern of hip and calcanium

POSTMENOPAUSAL OSTEOPOROSIS

• Photon absorptiometery show marked reduced bone contents

• Biochemical tests are usually normal



7.11 Osteoporosis (a) This woman noticed that she was becoming more and more 'round-shouldered'; she also had chronic backache and her x-rays (b) show compression of vertebral bodies. (c) The spine of a similar patient who, 6 years after this film was taken, fell in her kitchen and sustained the fracture shown in (d). The fracture incidence in women rises steeply after the menopause (e).

POSTMENOPAUSAL OSTEOPOROSIS TREATMENT AND PREVENSSION

Women at risk should take adequate diet rich in calcium at least 1500mg per day High level of activities Morning walk Avoid smoking Avoid alcohol

POSTMENOPAUSAL OSTEOPOROSIS TREATMENT

• OSTEOGEN replacement therapy for patients having early menopause and hysterectomy with ophrectomy

Calcitonin

• Bisphosphates are helpful

RICKETS AND OSTEOMALACIA

RICKETS AND OSTEOMALACIA

- Both terms means same disease. Rickets in children and osteomalacia in adults
- Inadequate mineralisation of bone in general
- In children it affects areas of active endochondral growth near major joints

In adults affect it whole Skelton, as a result bone softens and rate of bone formation is slow and unmineralized osteoid accumulates along surface of new bone

RICKETS AND OSTEOMALACIA CAUSES

- Calcium deficiency
- Hypophosphatemia
- Vit. D deficiency
- Under exposure to sun light
- Liver diseases
- Mal-absorption syndrome
- Renal disease- nephrectomy

RICKETS AND OSTEOMALACIA CLINICAL FEATURES

- In infants may presents as tetany and convulsions, failure to thrive, listlessness and muscular flaccidity
- In children early deformities of skull bones (craniotabes)
 Thickness of knees ankles and wrists and epiphysial over growth
 Enlargement of costochondral junction (rickety rosary)

Lateral indentation of chest (Harrisons sulcus)

RICKETS AND OSTEOMALACIA CLINICAL FEATURES

Internal bowing in children siting cross legged

Stunted growth

In severe cases coxa - vara, altered spinal curvature, bending or fractures are seen

RICKETS AND OSTEOMALACIA CLINICAL FEATURES

- OSTEOMALACIA has insidious course and patient experiences bone pain
- Backache
- Loss of height
- Kyphosis
- Knock knees
- Stress fractures etc

RICKETS AND OSTEOMALACIA RADIOLOGICAL FINDINGS

Thickening and widening of growth plate Cupping of metaphysis Bowing of diaphesis Looser zones, thin band of rarefacation in normal bone Stress fractures Biconcave vertebra Trefoil pelvis





b

7.15 Osteomalacia Three characteristic features of osteomalacia: (a) indentation of the acetabula producing the trefoil or champagne-glass pelvis; (b) Looser's zones in the pubic rami and left femoral neck; (c) biconcave (codfish) vertebrae.

RICKETS AND OSTEOMALACIA BIOCHEMISTRY

Decreased levels of serum calcium and phosphate

Increased levels of alkaline phosohatase

Diminished urinary calcium

25-HCC levels are low

RICKETS AND OSTEOMALACIA CLINICAL VARIETIES

	Vitamin D deficiency	Renal tubular	Renal glomerular
Family history	-	+	-
Myopathy	+	-	+
Growth defect	±	++	++
Serum: Ca P Alk. phos.	↓ ↓	N ↓ ↑	↓ ↑
Urine: Ca P	↓ ↓	↓ ↑	ţ
Osteitis fibrosa	±	+	++
Other	Dietary deficiency or malabsorption	Amino- aciduria	Renal failure Anaem

RICKETS AND OSTEOMALACIA TREATMENT

- Vit-D 400 to 2000 IU per day
- Calcium 1000 mg per day
- High protein diet