OSTEOPENIA

• OSTEOPOROSIS

• OSTEOMALACIA
VITAMINE D PRODUCTION

- VIT D2
- VIT D3
- 25-OH-VIT D3
- 1,25-OH VIT D3 VS. 24,25-OH VIT D3
OSTEOMALACIA - CLINICAL PRESENTATION

• Diffuse pain (away from joints)
• Muscle weakness (waddling gait)
• Hx of prior fx (rib/spine/long bone)
OSTEOMALACIA
X-RAY IN ADULTS

• Code fish vertebrae
• Looser Zone
OSTEOMALACIA - LAB.

- Ca, P, Akp, PTH, 25-vit D, 1,25-Vit D
# Osteomalacia – Lab.

<table>
<thead>
<tr>
<th>Disease</th>
<th>CA</th>
<th>P</th>
<th>Akp</th>
<th>PTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vit. D Dep. Ricket</td>
<td>L</td>
<td>L</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>VDRR (hypophosphotomemic Ricket) * X link dominant</td>
<td>NI</td>
<td>L</td>
<td>H</td>
<td>N</td>
</tr>
<tr>
<td>Renal osteodystrophy</td>
<td>H</td>
<td>H</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>Hypophosphatasia *AR</td>
<td>nl</td>
<td>nl</td>
<td>L</td>
<td>nl</td>
</tr>
<tr>
<td>Hyperparathyroid</td>
<td>H</td>
<td>L</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>Idiopathic Juvenil Osteop.</td>
<td>nl</td>
<td>nl</td>
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</tbody>
</table>
OSTEOMALACIA-TREATMENT

- Find the cause and treat it.
# Osteoporosis

<table>
<thead>
<tr>
<th>Type</th>
<th>I</th>
<th>II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cause</td>
<td>postmenopause</td>
<td>age</td>
</tr>
<tr>
<td>age</td>
<td>51-70</td>
<td>&gt;70</td>
</tr>
<tr>
<td>F : M</td>
<td>6:1</td>
<td>2:1</td>
</tr>
<tr>
<td>Bone loss</td>
<td>trabeculae</td>
<td>Trabeculae + corticle</td>
</tr>
<tr>
<td>Fx sites</td>
<td>Crushed vert.</td>
<td>Wedge vert.</td>
</tr>
<tr>
<td></td>
<td>IT fx, wrist</td>
<td>Femoral neck.</td>
</tr>
</tbody>
</table>
OSTEOPOROSIS - HISTORY

- Menopause
- Periods of amenorrhea
- Nutrition
- Inactivity
- Smoking
- Alcohol
OSTEOPOROSIS-LAB

- CBC, ESR, CHEM20, SPEP, TSH, PTH
OSTEOPOROSIS - IMAGING

- DXA (Dual-energy x-ray absorptiometry)
- Classification I to IV levels (compare to peak bone mass of young same gender)
- Two fold increase of Fx. Rate with each standard deviation.
OSTEOPOROSIS-TREATMENT

• CALCIUM
  • Young adult = 1200 Mg/day
  • Premenopause = 1000 Mg/day
  • Postmenopause = 1500 Mg/day
OSTEOPOROSIS-TREATMENT

• VIT D
  • 400 IU/DAY
  • 800 IU/DAY MAX.
OSTEOPOROSIS-TREATMENT

• ESTROGEN
  • 0.625 MG/DAY
  • Contraindication:
    • Breast Cancer
    • Uterine Cancer
    • Thromboembolic disorders
  • Raloxifene(selective estrogen-receptor modulator) 60mg/day
OSTEOPOROSIS - TREATMENT

• Bisphosphonates
  • 1st generation: Etidronate
  • 2nd generation: Alendronate
    • 5mg/day prevention
    • 10mg/day treatment
    • Instruction and side effects.
  • 3rd generation: Risedronate
OSTEOPOROSIS TREATMENT

- Calcitonin
  - Salmon 200 IU/day
  - Has both analgesic and protective effects
OSTEOPOROSIS TREATMENT

- Flouride
  - Increase bone formation but impair bone mineralization. (May increase bone density but increase rate of fractures)
OSTEOPOROSIS TX. PROTOCOL

• Premenopause
  • Eumenorrheic
    • Ca 1000, Vit D 400, exercise
  • Amenorrheic
    • Above + estrogen or ocp
OSTEOPOROSIS TX. PROTOCOL

- Postmenopause
  - BMD <2.5
    - Ca 1500, Vit D. 400, estrogen
  - BMD >2.5 or fracture
    - Above + calcitonin
CONCLUSION

- Best treatment of osteoporosis is prevention.
- Best treatment of osteomalacia is to treat the cause.