ENDOCRINE DISORDERS IN THE ELDERLY (part 1)

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INTERNAL MEDICINE: ENDOCRINOLOGY
Outline of talk:

- **Introduction**: Endocrinology
- **Diabetes mellitus**: - Type 1
  - Type 2
- **Osteoporosis**
- **Thyroid disorders**: - Hyperthyroidism
  - Hypothyroidism
- **Hypogonadism**: – Male
  – Female
- **Growth hormone deficiency** in adults
INTRODUCTION

Endocrine system:

- The bodily system that consists of the endocrine glands and the hormones that they secrete.
- Endocrine system is composed of ductless glands that secrete hormones directly into the blood.
- = the major controller of the flow of information between different cells and tissues of the body.
Hormones = chemical messengers, produced and stored in endocrine glands

Controls and regulates the activity of certain cells or organs (generate a response)

When secreted, they exert effects on target tissues or glands distant from the source

They bind to specific receptors

Hormones regulate various human functions, including metabolism, growth and development, tissue function, and mood
A gland secretes a chemical, which is transported by blood to an organ and tissue. Changes occur in these locations.
General principles

- Must distinguish between endocrine conditions **caused by aging** (e.g., gonadal failure) from **age-associated conditions** (e.g., thyroid problems more common in the elderly).
- All organs have different **reserve capacities**; endocrine diseases often present with symptoms in the **most compromised organ system**.
- The elderly often have multiple diseases and take many medications that may **mimic or mask** the usual presentation of an endocrine disease.
DIABETES MELLITUS

Definition

☆ Diabetes mellitus - “Honey urine”

☆ Clinical condition characterised by a chronically ELEVATED BLOOD SUGAR LEVEL

☆ Caused by an absolute or relative insulin deficiency

- **Absolute** = insulin not produced by pancreas
- **Relative** = insufficient insulin or insulin action for the body’s requirements
☆ Disease which affects the metabolism of carbohydrates, protein and fat
☆ Results in complications in every tissue and organ of the body
Insulin actions

- Liver
- Muscle
- Adipose tissue
Classification

- **Type 1 diabetes mellitus**
  - autoimmune
  - idiopathic

- **Type 2 diabetes mellitus**

- **Gestational diabetes mellitus**

- **Other** - includes endocrinopathies, exocrine pancreatic problems, genetic defects of beta cell function, drug-induced diabetes & genetic syndromes associated with diabetes
Type 1 diabetes mellitus

- State of **absolute** insulin deficiency
- Secondary to pancreatic $\beta$-cell destruction
- Dependent on **insulin** for survival
- Altered fat metabolism results in **ketone** production
Presentation type 1 DM

- 10 - 20% of all diabetics
- Usually presents in childhood
- Marked **loss of weight**
- Polyuria
- Polydipsia
- Blurred vision
- Diabetic ketoacidosis
Type 2 diabetes mellitus

- Insulin resistance → hyperinsulinaemia
- Varying degree of $\beta$-cell dysfunction
- Classic type 2 diabetic:
  - Obese $> 80\%$ → insulin resistance
  - Non-obese $< 20\%$ → $\beta$-cell dysfunction
Insulin Resistance

**Definition:**

A state where a given concentration of insulin is associated with a subnormal glucose response as a result of insensitivity of the peripheral tissue to the effect of insulin. This gives rise to hyperinsulinaemia.
Clinical risk factors for type 2 diabetes mellitus

- Age
- Obesity
- Lack of physical activity
- Family history of diabetes
- Previous gestational diabetes
- Secondary causes: drugs, endocrinopathies
- Race / geography
Clinical picture

- Disease of lifestyle
- Do not need insulin to survive, but later on may develop ↓ insulin secretion
- Usually incidental finding, or following a long period of subclinical illness
- May present with complications e.g. neuropathy, myocardial infarction, diabetic foot
- Usually present in a mild form for 5-10 years before diagnosis; strong family history
- Presentation may be precipitated by pregnancy, drugs, illness
Acanthosis nigricans
Subacute and may present with:

- Chronic tiredness

- **Pruritis** – balanitis or vaginitis secondary to candidiasis

- Recurrent **skin infections, other infections, muscle cramps in legs**

- **Blurred vision** secondary to osmotic changes in the lens
<table>
<thead>
<tr>
<th>Type 1</th>
<th>VS</th>
<th>Type 2</th>
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<tbody>
<tr>
<td>Younger, thinner</td>
<td></td>
<td>Older, often obese</td>
</tr>
<tr>
<td>Symptoms: weeks</td>
<td></td>
<td>Months to years</td>
</tr>
<tr>
<td>Weight loss: +++</td>
<td></td>
<td>Weight loss: +/−</td>
</tr>
<tr>
<td>HLA DR3/DR4</td>
<td></td>
<td>No HLA links</td>
</tr>
<tr>
<td>30 - 40% concordance twins</td>
<td></td>
<td>90% concordance in identical twins</td>
</tr>
<tr>
<td>Autoimmunity, association with other autoimmune diseases</td>
<td></td>
<td>No evidence of immune disturbance</td>
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<tr>
<td>Insulin deficient, DKA, insulin essential</td>
<td></td>
<td>Partial insulin deficiency, may require insulin late in disease</td>
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<tr>
<td>Eventual disappearance of C-peptide</td>
<td></td>
<td>C-peptide persists</td>
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Diabetic complications

- Mainly **vascular:**
  - **Microvascular** (more prominent in type 1)
  - **Macrovascular** (more prominent in type 2)

- Also:
  - Diabetic foot
  - Infections
  - GIT
  - Skin
  - Connective tissue and joint involvement
  - Bone and mineral metabolism
Microvascular complications

- Diabetic retinopathy
- Diabetic nephropathy
- Diabetic neuropathy
MICROVASCULAR:

1. Diabetic retinopathy and other eye involvement
Diabetic retinopathy / Cataracts

- Normal retina
- Retinopathy

- Macula
- Optic disk
- Hemorrhage
- Aneurysms

Eye with cataract
2. Renal complications