Diabetes mellitus in elderly patients

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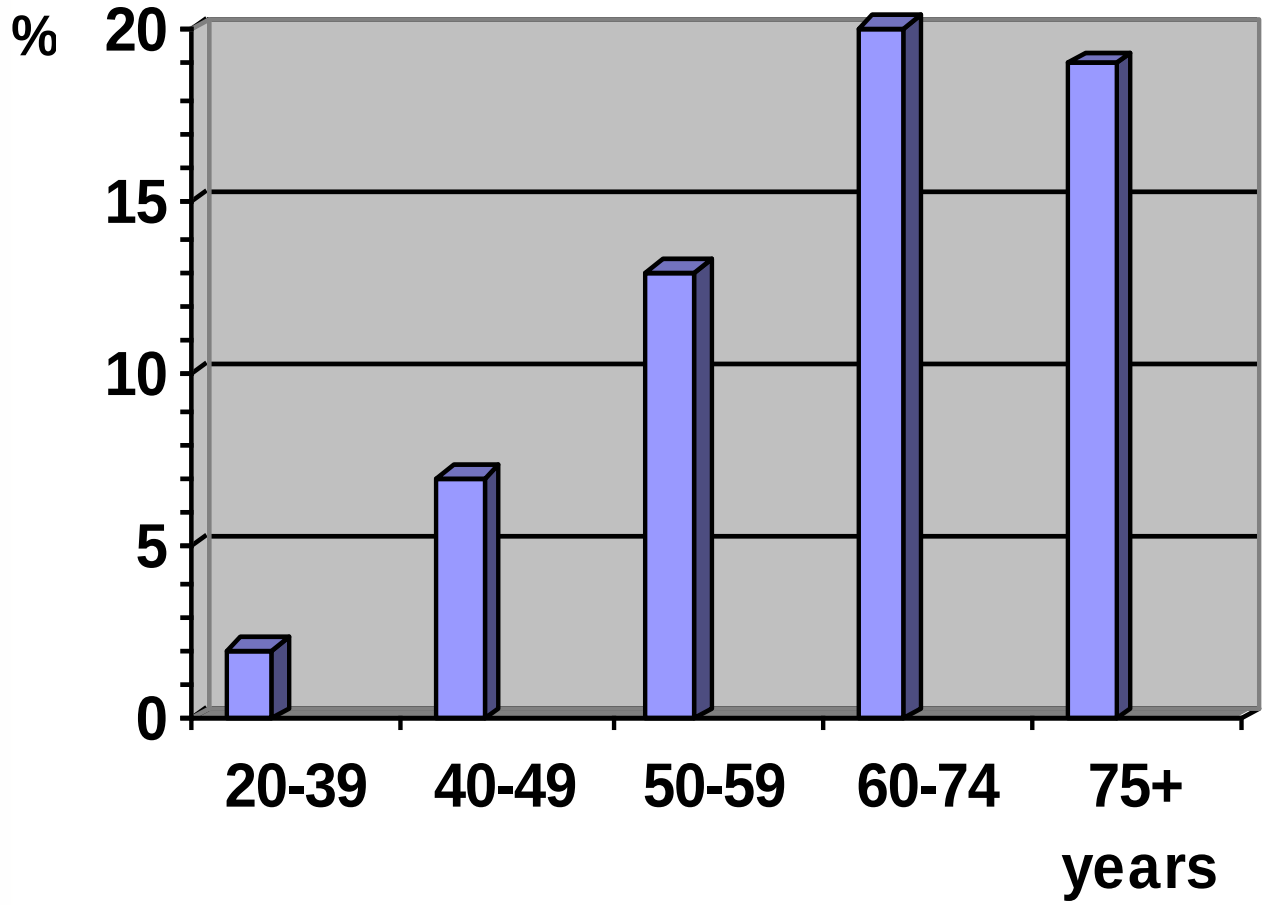
Diabetes mellitus in elderly

- one of the most common chronic diseases
- cause of complications
- could seriously worsen the quality of life
- incidence and prevalence of diabetes are increasing with age.

The most important variables (that affect the prevalence of DM) :

- age, aging
- sex (males more than females)
- country of residence (more in towns)
- race and ethnicity (blacks more than whites)
- socioeconomic status
- obesity (doubles the risk of having diabetes)
- sedentary lifestyle

Prevalence of abnormal glucose tolerance



Physiology

- Alterations in glucose metabolism with age:
- 1/ glucose-induced insulin release (decresed beta-cell response to the incretin hormons glucose-dependent insulinotropic peptid GIP and glucagon-like peptid GLP-1)
- 2/ increasing of insulin resistance, i.e.resistance to insulin-mediated glucose disposal (less of muscle volume, more of intraabdominal fat)

Physiological worsening of insulin resistance in ageing process

- Decrease in total muscle volume (30% in 70s and 40-45% of muscel volume in 80s) - sarcopenia
- Less physical activity
- Quality of nutrition is worse

Loss of muscle volume

causes 2 implications :

- **Limited glucose processing** = disposal of absorbed glucose is dependent on the muscle volume
- **The volume of total body fat is increasing,** as well as the propotion of visceral fat is increasing (metabolically active visceral fat - lipolysis, ↑ FFA (Randl´s pathway)

The result: IR is increasing

Physiology :

- Fasting glucose level rises about 0.055 mmol/l with every decade of age.
- Postprandial glucose level rises about 0.3-0.7 mmol/l with every decade of age.

- In people with inherited predisposition could worsening of glucose metabolism cause the development of diabetes

Pathophysiology :

- For developing of diabetes in older people are important following factors :
- * genetic factors
- * change of lifestyle in old people - sedentary lifestyle, decreased physical activity
- * obesity
- * drugs intake (beta-blockers, thiazid diuretics, oestrogens)
- * diet high in saturated fats and simple sugars and low in complex carbohydrates
- * deficiencies of trace elements (Cr, Zn, Mg) or vitamins (antioxidant vitamins C and E, vitamin D)

Types of diabetes in elderly :

- 90% people who develop diabetes have Type 2.
- about 10% people over 40 years have Type 1 (high titres of islet-cell antibodies and antibodies to glutamic acid decarboxylase (GAD).

Manifestation:

- asymptomatic
- typical clinical features of hyperglycaemia: polyuria, nocturia, excessive thirst, polydipsia, weakness, weight loss and fatigue
- nonspecific symptoms: mild to moderate weight loss, fatigue.
- manifestation of diabetes-related complications such peripheral nerve abnormities, visual loss, painful shoulder periarthrosis, poor wound healing, recurrent infections
- presence of ischemic heart disease, congestive cardiac failure, peripheral vascular or cerebrovascular disease.
- manifestation by hyperosmolar non-ketotic hyperglycaemia or diabetic ketoacidosis with severe dehydration, coma, seizures with high mortality rates.

Diabetes /IGT/IFG - risk factors :

- 1/ obesity : body mass index (BMI) more than 30
- 2/ abdominal obesity : waist circumference more than 88cm in women and more than 102cm in men
- 3/ positive family history od Type 2 diabetes in direct relatives
- 4/ hypertension
- 5/ presence of any vascular disease
- 6/ dyslipidemia

Diabetes /IGT/IFG - risk factors :

- 7/ positive history of glucose intolerance
- 8/ obstetrical history of babies over 4 kg at birth
- 9/ certain racial groups - Arab, Asian migrants, Hispanic Americans
- 10/ use of diabetogenic drugs - corticosteroids, oestrogens, thiazids, beta-blockers, phenytoin

Management of the elderly patient with IGT/IFG :

- an increased chance of developing diabetes and the cardiovascular complications
- goals for these patients are to normalize blood glucose levels and decrease risk factors for cardiovascular disease

Management of the elderly patient with IGT/IFG :

- 1/ weight reduction, diet and exercise (a nutritionally balanced diet and reduce their intake of simple sugars and fat. Recommended diet is a diet composed of 15-20% of total energy intake as protein, 25-30% as fat, 50-60% as complex carbohydrates and less than 10% as simple sugar)
- 2/ treatment of hypertension, dyslipidaemia and avoiding of smoking
- 3/ avoiding of diabetogenic drugs

Management of the elderly patient with diabetes :

- To control the degree and symptoms of hyperglycaemia
- To avoid large swings in glucose levels
- To avoid hypoglycaemia,
- To prevent or delay complications,
- to maintain the patients general well-being and independence

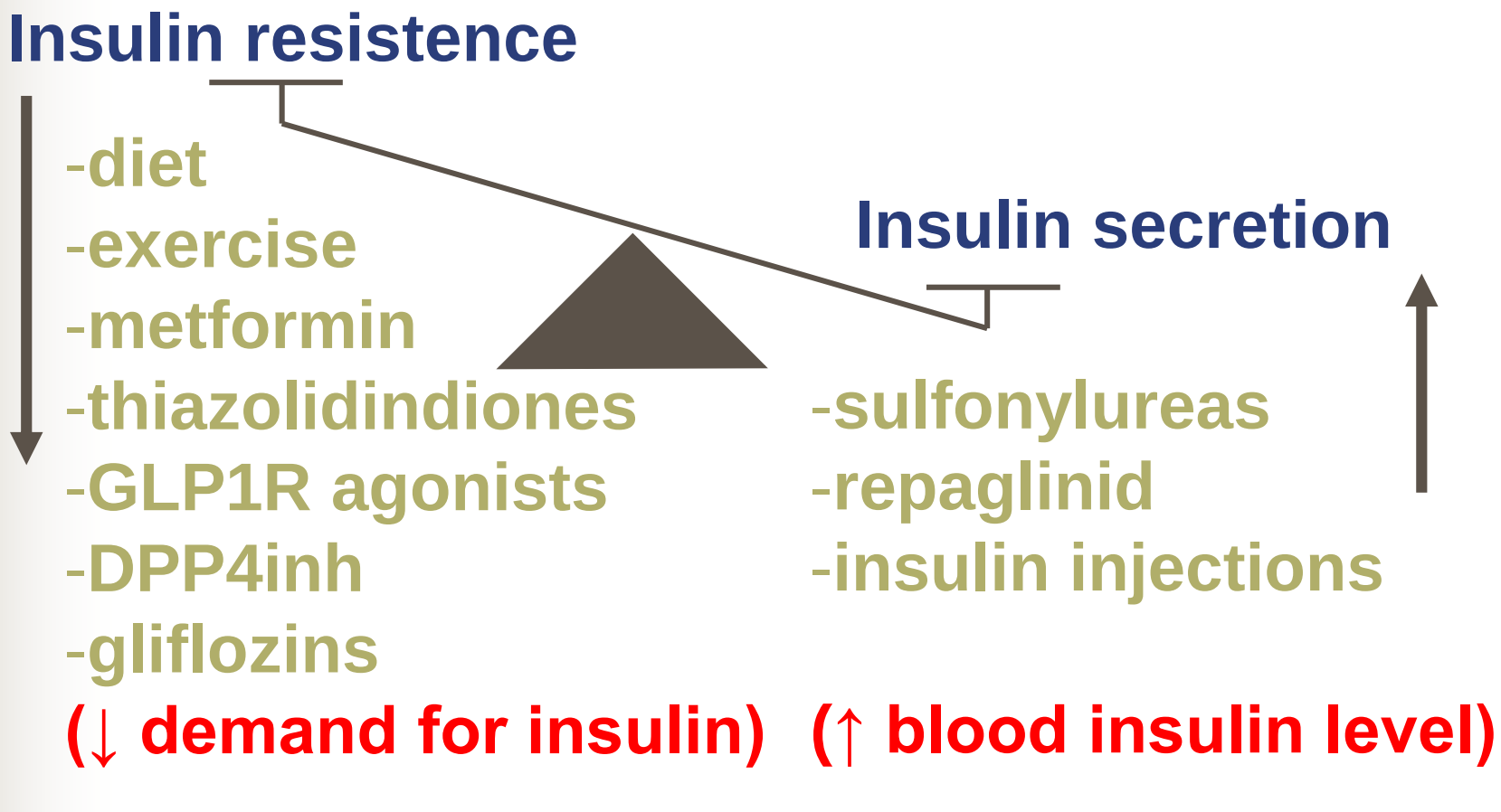
WHO criteria for ideal glycaemic control – targets:

- < 5.5 mmol/l fasting and < 7.8 mmol/l 2-hours postprandial = suitable for younger diabetic people and are too strong for many elderly people.
- fasting plasma glucose level of < 7.8 mmol/l fasting and < 11.1 mmol/l 2-hours postprandial is more appropriate in this age group.

Management of the elderly patient with diabetes :

- 1/ weight reduction, diet and exercise
- 2/ oral hypoglycaemic agents
- 3/ insulin
- 4/ Reduction of all risk factors for atherosclerosis
- 5/ Screening for diabetic complications

Type 2 diabetes mellitus treatment



oral hypoglycaemic agents

Increasing the insulin secretion: insulin secretagogues:

- Sulphonylureas - nonobese patients. Shorter-acting sulphonylureas are preferred (gliclaside, glimepiride)
- Short insulin secretagogues - repaglinide (Novonorm 0,5 or 1mg or 2mg 3x1) - rapid onset and shorter duration of action than sulphonylureas

Decreasing the insulin resistance:

- Metformin (Glucophage 850mg 2-3x1) - obese patients. contraindicated in the presence of cardiac, renal or hepatic impairment because of the risk of lactic acidosis.
- Thiazolidindiones increase insulin sensitivity . Pioglitazon (Actos 30mg 1x1)

- alfa-glucosidase inhibitors(Glucobay 3x1)

Insulin

- If diet, exercise and oral hypoglycaemic agents are still inadequate in controlling hyperglycaemia and its symptoms
- Insulin carries the risk of hypoglycaemia and should be used at the lowest dose that is effective to keep the blood glucose levels in an acceptable range.
- The insulin therapy is strong indicated in patients with Type 1 diabetes or in T2DM patients in acute situations

Management of risk factors for atherosclerosis

- Hypertension
- Dyslipidemia
- Coronary heart disease
- Weight reduction, regular physical activity, reduction in alcohol and salt intake are important parts of hypertension management. Angiotensin.converting enzyme (ACE) inhibitors and calcium-channel blockers are considered as the first-line drugs for treating hypertension in diabetic patients.

Summary :

- Early diagnosis is important to improve glycaemia, correct hyperglycaemic symptoms, prevent complications, and maintain quality of life and independence.
- Routine screening for diabetes by primary physicians is recommended for all persons 65 years of age or older, as well as in younger people there are in risk of diabetes
- Non-pharmacological measures are often successful in improving glucose tolerance in the patient with IGT/IFG and lowering their atherosclerosis risk.
- Oral hypoglycaemic agents and insulin must be used with caution in the elderly because of the increased risk of hypoglycaemia and drug toxicity.
- Regular screening for diabetic complications and risk factors for atherosclerosis should be performed in all persons with diabetes