

Learning unit: Antidiabetics

Impact of the learning unit:

The number of diabetic patients has been growing recently. Diabetes is a chronic metabolic disease with different etiopathology. Hyperglycemia is the common feature due to the insufficient effect of insulin through its relative or absolute deficiency. More than 90% of diabetic patients have type II diabetes (i.e., with relative insulin deficiency). Treatment of this disease is associated with high health care costs, and antidiabetic (hypoglycemic) drugs are the basis of treatment. Thus, knowledge of their pharmacology is necessary to use them correctly in the clinical practice.

Relevant terms

targets affected by antidiabetic drugs

- insulin resistance

- PPAR receptors

- secretion of insulin

- renal threshold for glucose

- incretin system

oral hypoglycemic agents

- biguanides

 - metformin

 - lactate acidosis as an adverse effect

- sulfonylureas

 - glibenclamide

 - gliclazide

 - weight gain as an adverse effect, hypoglycemia as an adverse effect

 - pharmacokinetic interactions

- thiazolidinediones

 - pioglitazone**

 - PPAR receptors – types, function (overview)

- alpha-glucosidase inhibitors

 - acarbose

- meglitinides

 - repaglinide**

- SGLT2 inhibitors (gliflozines, glycosurics)

 - empagliflozin**

- DPP-4 inhibitors (gliptins)

 - sitagliptin**

 - Incretin system

injectable antidiabetic agents

- GLP1 analogues (incretin mimetics)

 - exenatide

Learning outcomes

Student differs antidiabetic agents according to their route of administration and gives advantages and disadvantages of such administration.

Student explains mechanisms by which antidiabetics influence insulin secretion or insulin resistance. Student is aware of drug groups able to induce hypoglycemia and knows other adverse effects, including potential influence on body weight.

Student knows basic pharmacological profile (mode of action, unwanted effects, indications and contraindications) of antidiabetics.

Student describes an algorithm for choosing an antidiabetic agent for a model patient.

Study materials

Rang & Dale's Pharmacology, 8th edition, 2016, chapter 31 (The control of blood glucose and drug treatment of diabetes mellitus)

Study materials for courses aVLFA0721p and aVLFA0721c.

Exam questions

Special pharmacology: 8. Antidiabetics (except insulines)

Essential drugs: 23. metformine, 24. glimepiride, 25. sitagliptin