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Diploma in Pharmacy 1st Year
Pharmaceutical Chemistry
Important Questions
Chapter 9 : Hypoglycemic Agents

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Chapter 9
Hypoglycemic Agents
IMPORTANT Questions

Q1. What are the Hypoglycemia Agent and write about insulin and its Uses.

Ans.

HYPOGLYCEMIC AGENTS

→ Hypoglycaemic agents are used in the treatment of diabetes mellitus by lowering the blood glucose levels.
→ With the exceptions of insulin, exenatide, liraglutide and pramlintide, all the other hypoglycaemic agents are administered orally and are therefore known as oral hypoglycaemic agents or oral anti-hyperglycaemic agents.

Insulin

→ Paul Langerhans (a German medical student) in 1869 studied that the pancreas has two different groups of cells, i.e., the acimer cells that secrete digestive enzymes, and islets (cells clustered in islands) that serve a second function.
→ Banting, Macleod, Bert, and Collip isolated insulin from bovine pancreas and used it for treating diabetes mellitus.
→ Insulin is a hormone produced in pancreas and permits the body to utilise sugar (glucose) from carbohydrates in the food.
→ Insulin restricts the blood sugar levels from getting too high (hyperglycaemia) or too low (hypoglycaemia).
→ Insulin occurs as a white or almost white coloured crystalline powder.
→ It is faintly soluble in water; soluble in dilute solution of mineral acids and with degradation in solutions of alkali hydroxide; and almost insoluble in alcohol, chloroform, and ether.

Uses

Insulin has the following uses:

i. It is used for controlling diabetes mellitus (uncontrollable by diet alone) or for treating insulin dependent diabetes mellitus,
ii. It is used for regulating carbohydrate metabolism.
iii. It is used for treating hyperkalemia.
iv. It is used for treating severe ketoacidosis or diabetic coma.

Q2. Write short note on metformin, Glibenclamide.

Ans.

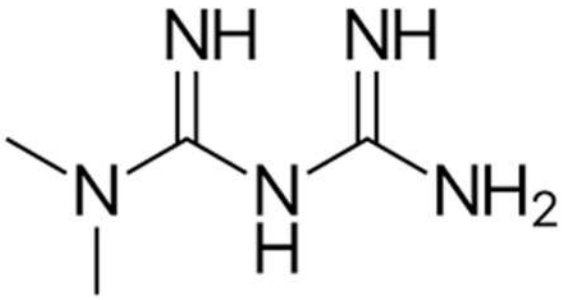
Metformin

→ Metformin is a biguanide antihypertensive agent.

→ It improves glycaemic control by decreasing hepatic glucose production and glucose absorption, and also by increasing insulin-mediated glucose uptake.

Chemical Name and Structure

N,N-Dimethylimidodicarbonimidic diamide



Mechanism of Action

➲ Metformin reduces the blood glucose levels by decreasing hepatic glucose production (gluconeogenesis), decreasing the intestinal absorption of glucose, and increasing insulin sensitivity by increasing the glucose uptake and utilisation by the peripheral tissues.

Uses

1. It is used as an adjunct to diet and exercise in NIDDM patients older than 18 years.
2. It can also be used for managing metabolic and reproductive abnormalities related to polycystic ovary syndrome.
3. It can also be used with a sulphonylurea or insulin to improve glycaemic control in adults.

Stability and Storage Conditions

- This medication should be kept in the tightly closed container and out of reach of children.
- It should be stored at room temperature and kept away from light, excess heat and moisture.
- It should not be stored in the bathroom.

Types of Formulations

- Suspension
- 2)Tablet
- Solution

Popular Brand Names

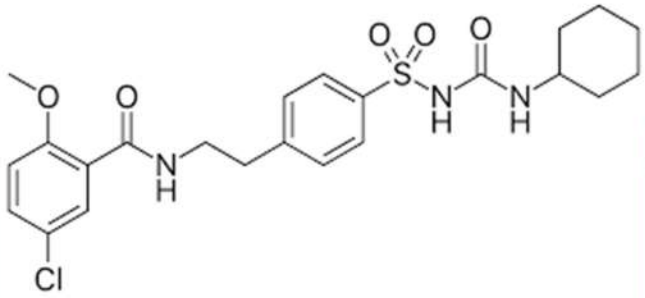
- Fortamet
- Glucophage
- Glucophage
- Glumetza
- Riomet

Glibenclamide

→ Glybenclamide is an oral antihyperglycaemic drug of sulfonylurea class.
→ Glybenclamide is a white to silver crystalline compound with molecular formula C23H28CIN3o5S and molecular weight 494.oo.

Chemical Name and Structure

1-[[p-[2-[5-chloro-o-anisamido) ethyl] phenyl] sulfonyl]-3-cyclo-hexylurea



Mechanism of Action

➲ Glibenclamide is an oral hypoglycaemic agent of the sulfonylurea group.
➲ It acts by lowering the blood glucose level acutely by stimulating the release of insulin from the pancreas.
➲ This is an effect dependent upon functioning B-cells in the pancreatic islets.
➲ Extrapancreatic effects may play a part in the mechanism of action of oral sulfonylurea hypoglycaemic drugs,

Uses

1. It is used to treat patients with impairment of hepatic function.
2. It acts as a hypoglycaemia and hematologic agent

Stability and Storage Conditions

- It can be stored at a temperature of more than 4o C or at 4o° C for at least 9o days.

Type of Formulation

♦ Tablets

Popular Brand Names

➢ Diabeta
➢ Flycron
➢ Glyburide