



Modern Concepts of Insulin-Like Growth Factors in Normal Conditions and Their Role in Diabetes Mellitus

Uzbekova Nelli Rafikovna

Received 15th March 2021,
Accepted 26th March 2021,
Online 23th April 2021

Professor, candidate of medical sciences.

*Andijan State Medical Institute,
Uzbekistan*

ABSTRACT: Decreased or no release of insulin from the β -cells of the pancreas plays a major role in the development of diabetes. It is also associated with the stimulation of the pituitary gland (because the anterior pituitary secretes a hormone that acts against insulin), which increases the amount of sugar in the blood and urine. The release of large amounts of glucagon from pancreatic α -cells also causes hyperglycemia. Parenteral administration of large amounts of glucose also develops diabetes .

Key words: Insulin, long-acting agents, pancreas, drugs (antibiotics), neutral environment, injection, biological efficacy, side effects, hypoglycemic coma allergic reactions, result.

Introduction

Diabetes mellitus is a metabolic disease in which the accumulation and burning of sugar in the tissues to one degree or another is disrupted and the amount of unused sugar accumulates in the blood, and one of the classic symptoms of diabetes is glucosuria. Abu Ali ibn Sina was the first to record the clinical signs of diabetes.

Diabetes is by its very nature the product of environments such as strong mental experiences and impaired metabolism. Therefore, the following factors play a major role in the development of diabetes:

- severe mental trauma;
- some metabolic diseases and severe obesity;
- disturbance of neuro-trophic control of metabolism;
- people who are addicted to food but are less active;
- organic brain injury; tumors of the pituitary gland;
- rough anatomical lesions of the pancreas and its dysfunction of the islets of Langerhans;

For example: gallstone disease, Botkin's disease, liver tumors or atherosclerotic changes in the vessels of the pancreas, and others.

In addition, rapidly emerging and transient hyperglycemia and glucosuria can occur in severe mental trauma, when adrenaline is injected, and when excessive sweets are ingested.

True diabetes first passes as a functional disease, then becomes morphological changes in the islets of Langerhans, becoming permanent.

When the amount of sugar in the blood exceeds 180 mg%, the excretion of sugar from the urine remains constant. In fact, even in healthy people, sugar is filtered through the primary urine and reabsorbed into the blood during reabsorption. However, in diabetes, the enzymatic processes that cause the reabsorption of sugar through the parenchymal epithelium are disrupted, and 5-8% of sugar-containing urine accumulates in the bladder. As a result, excess glycogen accumulates in the epithelium of the renal tubules.

As the amount of sugar in the blood and tissues increases, the osmotic pressure in them changes and water leaks out of the tissues and dehydration of the tissues occurs, correspondingly a state of intense thirst and normal metabolism in the tissues is disrupted. At the same time, the excretion of large amounts of glucose in the urine also increases the excretion of water from the body, resulting in a further increase in thirst. 5-10 liters and more of urine is excreted per day. Urinary excretion is more pronounced during the day. The excretion of glucose from the body, the disruption of carbohydrate metabolism, does not provide enough energy for the body. So now the metabolism of proteins and fats is activated, the substances and fat fragments formed from the breakdown of fats increase in the blood. Even instead of the normal 1% fat, 5-10% fat in the blood causes diabetic lipemia. This means that the amount of cholesterol in the blood also increases, and cholesterol clots form in the skin - i.e., diabetic xanthomatosis occurs. In the blood gradually increases the saturation of substances with acetone: b-oximaslennoy and acetouxic acid and acetone, the breakdown of proteins in the body with fats, the loss of many proteins leads to further weight loss. Some of the amino acids derived from proteins form acetone bodies, and ketone bodies multiply in the body.

The above metabolic disorders disrupt the immune system,

B vitamins, especially vitamin B1, occur. This disrupts MNS function, causing neuralgia and neuritis.

Clinical manifestations of diabetes.

Patients with diabetes complain of severe thirst and loss of appetite, dry skin, accelerated and intensified urinary excretion, the patient loses weight, skeletal muscle relaxation is noted.

Itching and itching occurs on the skin, and in women, itching also occurs on the genitals (due to exposure to sugar in the urine).

In men, the state of impotence increases.

Xanthoses occur due to pigment carotene.

Patients experience general lethargy and lethargy, itchy skin, paresthesia, pain in various parts of the human body. Because neuritis, cardiovascular and MNS functional disorders are impaired in diabetes.

Poisoning the body with acidic substances causes diabetic coma of varying degrees, and the excretion of acetone bodies in the urine increases.

Clinical pharmacology of hypoglycemic drugs.

There is now a very large arsenal of hypoglycemic drugs, which are based on insulin and its various products, as well as sulfanylureas and biguanide products that reduce the amount of sugar taken orally.

From the onset of the disease, 20-30% of it is treated with insulin and its products, and about 40-45% is treated with oral hypoglycemic drugs.

As you know, insulin is made up of 51 amino acid polypeptides, which are made up of 2 different chain loops. It consists of a chain of 21 amino acids in the A-ring and 30 amino acid residues in the V-ring, which has 2 bisulfide bridges in the V-ring.

Insulin is metabolized in various tissues of the body, and most of it is produced in the liver, kidneys, pancreas and placenta. This process takes place in the presence of glutathione insulin - the enzyme transglutaminase.

The biological half-life of insulin is recorded at around 5 minutes.

There are cases of absolute and relative insulin intake:

1. Absolute acceptance:

In type I diabetes; In cases of comatose;

If type I diabetes is present in pregnant or lactating women and

When it is not possible to use oral drugs;

2. Relative - relative acceptance:

In type II diabetes, if it is not possible to use oral drugs;

In cases of severe injury or trauma;

When the amount of sugar increases due to severe infectious diseases;

When severely dehydrated; In diabetic neuropathy and others .

1 ED insulin 5 g excreted in the urine in 1 day. relative to glucose. Normally, there is almost no sugar in the urine.

Currently, 3 types of insulin drugs are used:

Insulins derived from the pancreas of horned black cattle;

Insulins taken from the stomach of pigs;

Human insulins obtained from the human pancreas by semi-synthetic and genetically engineered methods.

Insulins derived from black cattle differ from human insulins by 3 amino acid residues, while pig insulins differ by -1 amino acid residue.

The above insulin drugs are divided into 3 groups depending on the period of their action:

1. Short-acting insulin drugs (0.3-8 hours);

2. Medium-acting insulin drugs (2-20 hours);

3. Long-acting insulin drugs (up to 4-36 hours).

Short-acting insulin drugs are used in diabetes mellitus with ketoacidosis, diabetic coma, postoperative conditions and in the compensation of type I diabetes. The use of this group of drugs in diabetic coma is carried out on the basis of special regimens, for example, 6-10 ED insulin v / v every hour under strong control. Once released from the coma, insulin can now be delivered p / k. In general, in this case, insulin is infused intravenously (after the blood sugar drops to 14 mmol / l) together with degreasing solutions (5% glucose, saline solution, etc.). In this case, it is necessary to check the amount of K⁺ ions, if necessary, a solution of KCl is sent ...!

Long-acting insulin drugs are often used in compensated diabetes and are used in combination with regular insulin drugs. In this case, the doses of these drugs are selected in each case individually.

True, the release of disposable syringes and syringe-dispensers has greatly facilitated the use of insulin preparations. But getting the optimal dose of insulin a day with a single injection does not bring much good ...! If you take this dose of insulin in 2-3 times a day, the effect of the drug will be even better!

It is known from the literature that as the amount of glucose in the cells decreases, they also lose K^+ ions; Insulin delivery is temporarily stopped when the amount of K^+ ions decreases to 3.5 mmol / l.

Therefore, before treating diabetics, the amount of K^+ ions in their blood is measured. Because in the case of diabetic ketoacidosis, a deficiency of K^+ ions is noted. Depending on the deficit of K^+ ions, the rate of delivery of KCl solution is developed.

Long-acting insulin is given only p / k. They should be stored at $+4^\circ C$ to $+10^\circ C$, if they are frozen, their activity will be impaired.

Bulls have a pH = 3-3.5 of short-acting drugs derived from the pancreas, while the pH of all other insulin drugs is neutral. Therefore, insulin drugs with low pH are slowly absorbed from the injected site and have a biological efficiency of 70-75%.

The following side effects may occur when using insulin drugs:

1. Hypoglycemic coma (when insulin is given in large doses, when the diet is disturbed)
2. Anaphylactic shock.
3. Lipodystrophy, paraorbital tumors.
4. Allergic reactions to insulin, etc. Oral hypoglycemic drugs.

Drugs of this group are used in type II diabetes, ie INZSD and are divided into 2 groups:

1. Sulfonylureas.
2. Biguanide preparations.

Sulfonylureas include carbutamide (bucarbon, etc.), tolbutamide (butamide, etc.), chlorpropamide, and sulfanil urea, generation II glibenclamide (maninyl, etc.), glibornuride, glizoxepid, glipizide, glycid, glycide. and b. enters.

Biguanides include buformin (glibutyl, adebit, etc.) and metformin (diabofen, etc.).

Sulfanilmochevina drugs increase insulin synthesis from pancreatic cells, increase the sensitivity of cells to insulin release under the influence of glucose and increase the accumulation of glucose in muscles and liver under the influence of insulin, and inhibit the process of lipolysis in adipose tissue.

It also increases the production of hormones that enhance the release of insulin from OIS, resulting in accelerated secretion of glucagon from β -cells.

References:

1. Clinical Pharmacology, ed. V.G. Kukes, M. 1991
2. Fundamentals of Clinical Pharmacology and Rational Pharmacotherapy, M. 2002
3. Kharkevich D.A. Azizova S.S., Maxsumov M.N. and others "Pharmacology" textbooks
4. Lepaxin V.K. and dr. «Clinical pharmacology», M. 1988
5. Mamatov Yu and others "Clinical Pharmacology", T.2002..