

# TIROSTIMULIN

## INNOVATIVE OR THE TREATMENT OF THYROID DISEASES

### INSTRUCTIONS FOR USE

"APPROVED"

State Unitary Enterprise "State Center for Expertise and Standardization of Medicines, Medical Products and Medical Equipment" of the Agency for the Development of the Pharmaceutical Industry under the Ministry of Health of the Republic of Uzbekistan

This instruction should be read before you start taking this medicine, as it contains important and useful information for you. For more information, you can contact your doctor or pharmacist, or the company itself

**Trade name of the drug:** Tirostimulin.

**Active ingredient (INN):** Tirostimulin is a complex compound of the trace element copper with alpha-ketoglutaric acid.

**Dosage form:** gel for external use.

**Compound:**

**active substance:** tirostimulin - 0.2%,

**auxiliary substances:** carbomer (carbopol), sodium hydroxide, purified water.

**Description:** homogeneous gel of light emerald greenish color, odorless.

**Pharmacotherapeutic group:** means for the treatment of endocrine system pathology.

### Pharmacological properties

The drug is a complex compound of the trace element copper with alpha-ketoglutaric acid, which play an important role in metabolic processes, including those occurring in the thyroid gland.

Copper, which is part of Tirostimulin, is a vital trace mineral.

Copper is essential for the processes of osteogenesis, pigmentation and keratisation. It is an important component of the hematopoietic system of the human body. In this case, copper catalyzes the incorporation of iron into the structure of heme and promotes the maturation of erythrocytes in the early stages of their development.

Under the influence of copper, vitamins of group B, vitamins A and E are accumulated in the body, fat metabolism is normalized, including the synthesis of phospholipids, the metabolism of carbohydrates improves, and the immunobiological resistance of the body increases.

Copper, which is part of Tirostimulin, is involved in the construction and activation of a number of hormones and enzymes, including transaminases, which play an important role in the synthesis of thyroid hormones. During the synthesis of thyroid hormones, copper acts as an electron carrier. In addition, copper, by increasing the activity of

iodinase, promotes the effective attachment of iodine to the tyrosyl ring. Thanks to this, the assimilation of iodine and its involvement in the processes of hormone genesis in the thyroid gland is enhanced.

Thanks to these and a number of other properties, copper enhances the synthesis of thyroid hormones.

Alpha-ketoglutaric acid, which is a constituent of Tirostimulin, plays an important role in metabolism. It participates in the Krebs cycle, which is the main mechanism for generating energy, ensuring the energy balance of the human body.

The participation of alpha-ketoglutaric acid ensures the course of the transamination process, which is one of the most important stages in the endogenous synthesis of thyroid hormones. Another important function of alpha-ketoglutaric acid is the transport of ammonia, since it is one of the most important participants in the transport of ammonia in the metabolic pathways of its detoxification in the human body.

Tirostimulin, thanks to its unique composition, has an activating effect on the most important processes in the synthesis of thyroid hormones.

The drug activates enzymes of the oxidase series, and thereby contributes to the intensification of one of the initial stages of the synthesis of thyroid hormones - the process of converting phenylalanine into tyrosine. Tirostimulin also enhances the process of pyridoxal phosphate-dependent  $\beta$ -elementation, and thus has a positive effect on the condensation of mono- and diiodotyrosines, leading to the formation of tri- and tetraiodothyronines. Tirostimulin activates enzymes that affect the metabolism of iodine in thyrocytes. As a result, there is an effective iodination of the tyrosyl ring with tyrosine iodinase.

Tirostimulin, due to the content of copper and associated alpha-ketoglutaric acid, is able to activate a number of processes associated with transamination, act as an acceptor of amino and donor of the keto group, and thereby enhance the synthesis of thyroid hormones.

The drug normalizes the structural integrity of the thyroid gland, promotes the effective formation of new small follicles and an increase in the secretory activity of thyrocytes. Under its influence, the content of large follicles containing a dense colloid is significantly reduced.

The drug also stimulates biochemical processes in the liver. Due to this, a reduced rate of peripheral conversion of thyroxine into triiodothyronine, which is the most active thyroid hormone, is restored in a short time.

The use of the drug in diseases of the thyroid gland achieves an early and high therapeutic effect, proceeding with the restoration of the hormone-forming functions of the thyroid gland.

Tirostimulin helps to reduce the size of the nodes in nodular and mixed goiter, up to their disappearance. The drug has immunomodulatory activity. Under its influence, the suppressive activity of the immune system is restored.

Under the influence of the drug, there is a rapid normalization of the increased volumes of the thyroid gland and, as a result, the main clinical symptoms of thyroid diseases (feelings of suffocation and a lump in the throat, dizziness, hair loss, dry skin, etc.) disappear earlier.

Tirostimulin also has a hematopoietic effect.

### **Indications for use**

#### **Gel "Tirostimulin"**

is used in the treatment of the following thyroid diseases associated with iodine deficiency:

- diffuse goiter of mild and moderate severity;
- hypo- and euthyroid goiter, without and with an autoimmune component;
- mixed goiter;
- nodular / multinodular colloid proliferating goiter.

#### **Gel "Tirostimulin", combined with tablets of the drug "Glutamed"**

is used in the treatment of the following diseases of the thyroid gland:

- diffuse goiter of all severity;
- hypofunction of the thyroid gland;
- subclinical and overt hypothyroidism;
- diffuse goiter with an autoimmune component;
- mixed goiter;
- nodular / multinodular colloid proliferating goiter;
- autoimmune thyroiditis with hypothyroidism;
- primary and spontaneous hypothyroidism.

### **Method of administration and dosage**

The drug should be applied in a thin layer to the skin in the area of the thyroid gland 1 time a day, approximately 1 gram or 3-3.5 cm when squeezed out of the tube. Rub gently, without much effort until the gels are completely absorbed.

The course of treatment is 15-30 days. If necessary, the course of treatment can be extended or repeated courses can be prescribed.

It is considered expedient to combine the use of gels of the drug "Tirostimulin" with tablets of the drug "Glutamed" according to the following scheme:

1 light blue tablet and 1 white tablet 2 times a day or 2 light blue and 2 white tablets of Glutamed once a day, 0.5-1 hour before meals, followed by the application of Tirostimulin gel "According to the above scheme.

The course of combined treatment with both drugs is 15-30 days. If necessary, the course of treatment can be extended or repeated courses can be prescribed.

### **Side effects**

The drug, both for individual use and for combined use with the drug "Glutamed", is well tolerated, side effects have not been identified.

### **Contraindications**

Hyperfunction of the thyroid gland of any etiology, hypersensitivity to the drug.

### **Drug interactions**

The combined use of Tirostimulin with glutamed helps to achieve an earlier and more pronounced clinical effect, since these two drugs mutually reinforce the clinical effect, that is, they are synergists.

The synergism of action between Tirostimulin and glutamed is due to the fact that the constituent components of both drugs stimulate the successively interconnected stages of endogenous hormone genesis in the thyroid gland.

### **Special instructions**

With a copper deficiency in the human body, growth retardation, malnutrition, degenerative changes in aortic elastin, pigmentation disorders, gastrointestinal disorders, accelerated destruction of red blood cells are observed, and the enzymatic and hormonal activity of the body also decreases.

In chronic copper deficiency, a violation of osteogenesis occurs with changes in the skeleton (similar to those observed in rickets), destruction of the ends of long bones.

Tirostimulin, subject to the dosage regimen specified in the instructions for use, satisfies the daily requirement of the human body for a vital trace element like copper.

A decrease in the biosynthesis and secretion of thyroid hormones leads to a delay in mental and physical development, to a violation of tissue differentiation and a delay in the functional maturation of the central nervous system. At the same time, there is a decrease in the absorption of oxygen by the body, bradycardia, the accumulation of mucopolysaccharides in the skin, an increase in the concentration of lipids and cholesterol in the blood, hypothermia, a violation of many endogenous metabolic processes.

A low level of thyroid hormones in the fetus and newborn leads to the development of cretinism, a disease characterized by multiple disorders and severe irreversible mental retardation. When hypothyroidism occurs in older children, there is a lag in general development, without mental retardation.

#### *Use during pregnancy and lactation*

Tirostimulin belongs to non-toxic drugs, and due to this, it can be used both during lactation and during pregnancy, with the exception of thyrotoxicosis of pregnant women.

#### *Influence on the ability to drive a car and complex mechanisms*

There have been no studies of the effect of Tirostimulin on the ability to drive vehicles or use machinery

#### **Overdose**

Due to the fact that Tirostimulin is a non-toxic drug, the possibility of intoxication due to an overdose of the drug is unlikely.

#### **Release form**

Gel 0.2% 10 g and 15 g in tubes, vials together with instructions for medical use.

#### **Storage conditions**

Store at a temperature not exceeding 25 ° C, out of the reach of children.

#### **Best before date**

4 years. Do not use after the expiration date.

#### **Conditions of dispensing from pharmacies**

On prescription.

#### **Manufacturer**

LLC «A.B.- BIOKOM»

**The company cares about the quality of its products and the health of consumers. In this regard, your feedback and wishes about the drug, about its effectiveness, or about the possible side effects identified in you, as well as any important information about the drug for you, please inform us in written form or by phone**

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