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CHEMICAL COMPOSITION OF CERTAIN DRUGS USED TO TREAT AND PREVENT THYROID DISEASES

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Annotation

Unfortunately, the number of people worldwide suffering from thyroid diseases is increasing. This process causes research in medicine, folk medicine, and pharmaceuticals. Medicines and their chemical composition, side effects pharmacology, and pharmacokinetics in the human body have been studied using literature to combat these diseases in the U.S. and some countries.

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Introduction. It is known that the use of medicinal herbs in the prevention and treatment of diseases is a common value for all nations. Because the biologically active substances contained in the plant are not only metabolites for the human body but also have healing properties. In the direction of biologically active compounds and research on their basis, it is important to note that certain biologically active substances remain the basis for obtaining new effective biologically active compounds [1]. Furthermore, research is being investigated by ultraviolet and infrared spectroscopy methods of obtaining, interacting, and obtaining biologically active supramolecular components of natural compounds [2]. According to the World Health Organization about 2 million of the earth's population now live in a climate of iodine deficiency. If 31% of it is for school children, the figure is 52% in European countries [3]. The use of harmless natural remedies to treat and prevent the growing number of endocrine diseases, especially among women and children, is the most acceptable solution to the problem facing modern medical professionals. Breakdown of the function of the thyroid gland

is considered the basis of all internal diseases, including internal and external joints. The resulting embryo was allowed to develop in nutrients and then inserted into her womb, where it implanted.

It is known that May 25 was designated by WHO as World Thyroid Day. This is due to the fact that worldwide the disease associated with this organ is increasing year after year. When scientists studied the causative factors of thyroid diseases, 80% of it was found to be caused by chronic iodine deficiency. As of 2010, 187 million people worldwide (2.7% of the population) experience iodine deficiency leading to thyroid disease[4]. This led to the death of 2,700 people in 2013, an increase of 2100 compared to 1990[5]. The lack of this microelement remains around the world. It is estimated that one in every five women over the age of 50 is experiencing symptoms of hypothyroidism. Today, all major pharmaceutical companies around the world produce drugs used in thyroid function disorders in natural and synthetic forms.

Table 1.

№	Name of the medicine	Manufacturing form	Active compound	Additional substance	Manufacturer
1	Iodum	Granula	Potassium iodide	Sucrose, lactose	Boiron (France)
2	Iodilife	Tablets	Potassium iodide, Foli kislotasi, sianokobalamin	Laktoza	Italy (Italy Pharmaco)
3	Yod balans	Tablets	Potassium iodide	Magnesium stearate	Germany (Merk KGaA)
4	Sulphur iodatum	Granula	Iodine and S (3: 1)	Sucrose, lactose	Boiron (France)
5	Jodthyrox	Tablets	Sodium levotiroxin, potassium iodide	Cellulose, magnesium stearate, gelatin	Germaniya (Merk KGaA)
6	Levotiroxine	Tablets	Sodium levotiroxine	Mannit	Valenta farmasevtika (Rossiya)
7	Antioksikap yod	Capsule	Potassium iodide	Betacarotin, vitamins and minerals	Minsk
8	Thyroid Health Formula	Capsule	Potassium iodide Copper gluconate	L-thyroid L-selenometionin Ashwagandha Extract Guggul Extract	Canada
9	Thyrocsin	Capsule	Potassium iodide Vitamin C Vitamin B12	Rux (xelat) L-Selenometionin Mis sitrat L-tirozin	AQSH (Thorne)

10	Thyroid Energy	Capsule	Potassium iodide Copper amino acid chelate, folic acid	L-thyroid Zinc methionine complex Ashwagandha Ekastrakti	USA (NOW Foods)
11	Potassium Plus Iodine	Tablets	Potassium iodide Sodium alginate	Cellulose, stearin acid, magnesium stearate	USA (NOW Foods)
12	Iodine	Drops	Potassium iodide	Deionized water	USA (Eidon)
13	Iodoral	Tablets	Potassium iodide	Cellulose, stearic acid	Canada (Optimox)
14	Iodine	Tablets	Potassium iodide	Cellulose, Calcium Phosphate, Magnesium Stearate	USA (Natures Plus)
15	Iodine	Capsule	Potassium iodide	Cellulose, rice bran extract	USA (Solaray)
16	Iodine	Capsule	Potassium iodide	Glycerol	USA Dr. Mercola
17	Organic Iodine Liquid Drops	Drops	Potassium iodide	Sweet water	USA (Mary Ruth's)
18	Yodiksanol-Unik	Injection	Organic iodine	Trometamol	India
19	Thyroid Support	Capsule	Organic iodine (derived from kelp)	Folates, Magnesium (Oxide and Helat) Zinc monometionin, Copper gluconate	Jeneva
20	Iodonorm	Tablets	Potassium iodide	Magnesium and calcium stearate, starch	Kazakhstan (XimFarm)
21	Tyrosine &Iodine	Capsule	Iodcasein	Amorphous silicon dioxide and magnesium stearate	Evalar (Russia)
22	Йод органический	Capsule	Iodcasein	Amorphous silicon dioxide and magnesium stearate	Evalar (Russia)
23	Йод-Актив	Tablets	Iodcasein	Non-fat milk powder, lactose monohydrate and calcium stearate	DIOD (Russia)
24	ЙодFe	Syrup	Iron Fumurate Concentrated Active Iodine	Folic acid	Healthy Life Pharm MCHJ Uzbekistan
25	ЙодMg	Syrup	Concentrated Active Iodine	Magnesium Lactate	Healthy Life Pharm MCHJ Uzbekistan

Although synthetic drugs containing iodine are used in thyroid disease, these tools can have a negative impact on patients with pathologies in the digestive system, such as the digestive system. The resulting embryo was allowed to develop in nutrients and then inserted into her womb, where it implanted [6].

It is known that the thyroid gland produces the hormone thyroxine. In mass, more than 65% of the hormone thyroxine consists of iodine. The thyroxine hormone is inactive and is activated by the enzymes of deiodinase. This process occurs in the thyroid gland[7].

The following is the process of activation of thyroxine hormones in the human body:

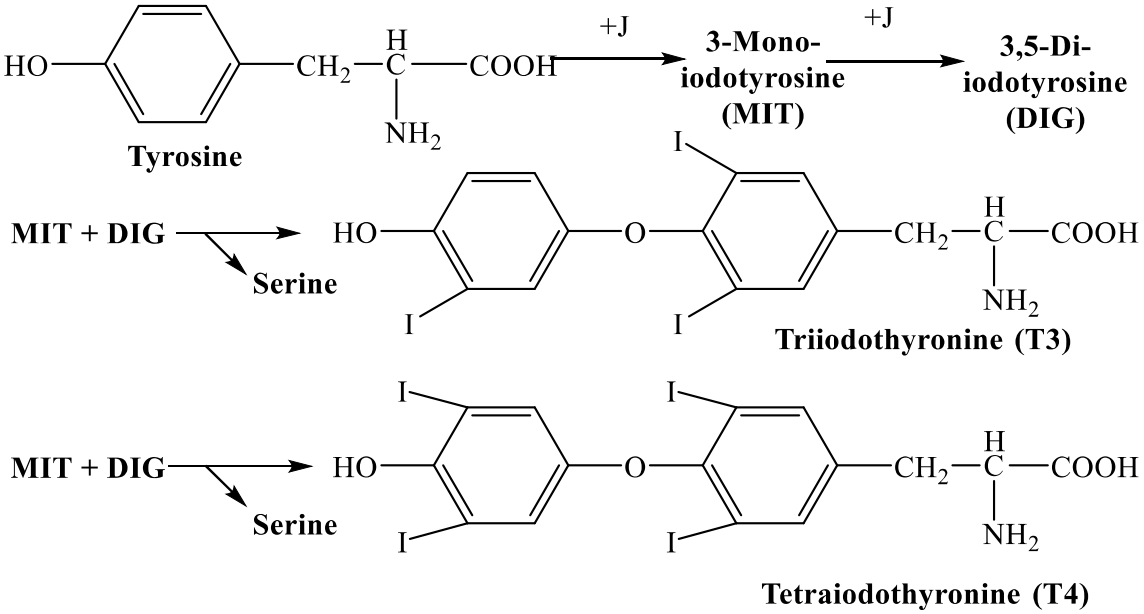


Figure 1. The process of synthesis of thyroid hormones in the human body

The synthesis of thyroid gland hormones originates as part of a specific thyrolobulin molecule from thyroid and iodine atoms and includes 2 stages. When a signal in the form of TSH (thyroid stimulating hormone) arrives in the thyroid gland, follicle cells, along with thyrolobulin, hold colloidal droplets, lysomal protease enzymes hydrolyse the protein into amino acids and enter the ready T3 and T4 blood. [8]

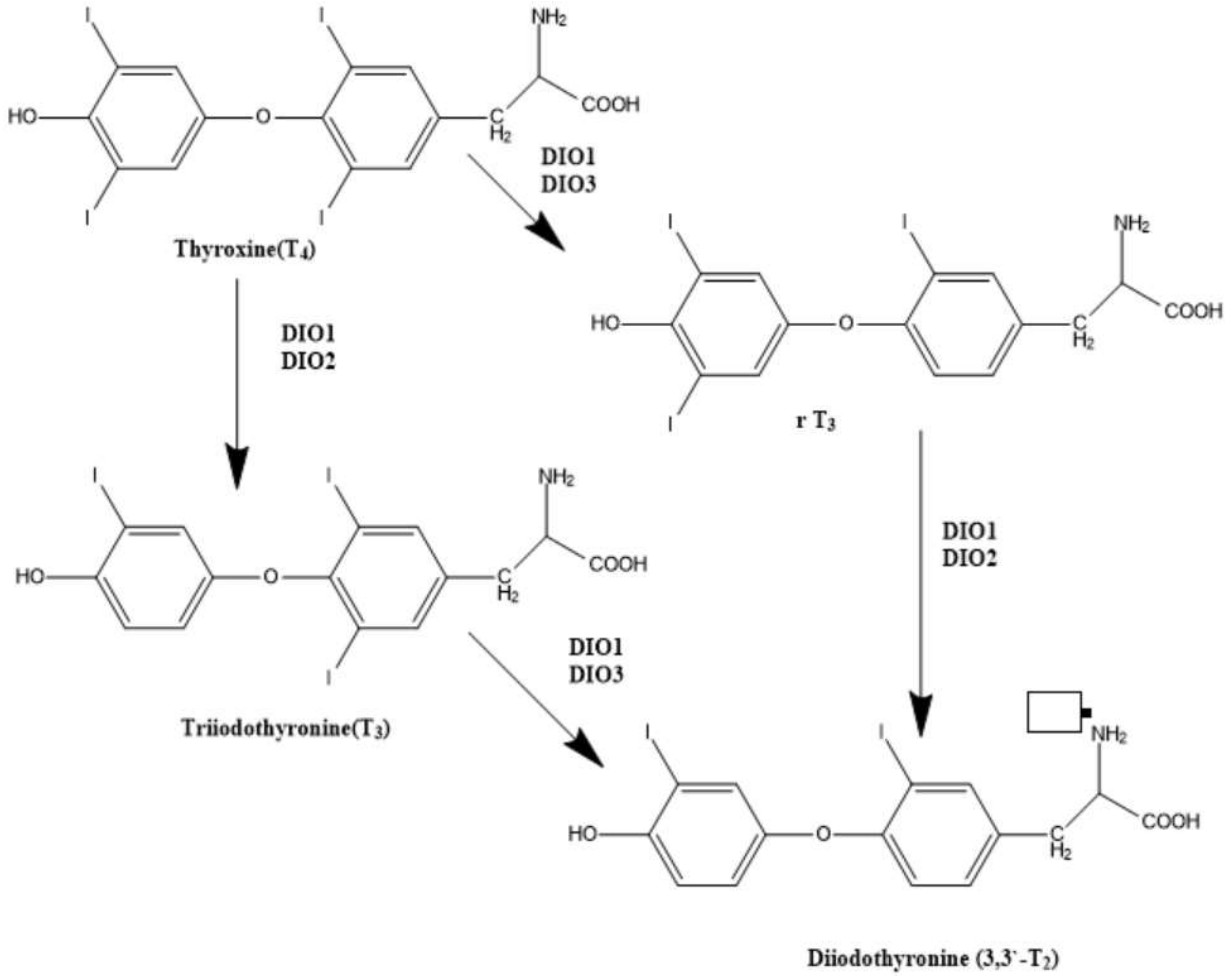


Figure 2. The process of deiodination of the thyroxine hormone in the body

In order for this process to occur in the human body, it is necessary to have a sufficient amount of non-exchangeable tyrosine amino acid, thioperoxidase enzyme, iron and iodine in the body. If a person consumes meat products in sufficient quantity, i.e., the amount of tyrosine amino acid is normal and iron deficiency anemia is not observed, but if there is a lack of iodine, a deficiency in this biochemical process is observed. This causes hypothyroidism.

The L-isomer of tyrosine, the only form involved in protein synthesis in humans, is common in animal proteins and is one of the 20 standard amino acids required for normal human function. However, tyrosine is considered "exchangeable" because it does not need to be taken in with food, but can be synthesized by the human body through chemical reactions from other compounds - in this case, it is synthesized from phenylalanine.

L-tyrosine (also called tyrosine) is an amino acid. It is considered an exchangeable amino acid because the body can make tyrosine from another amino acid, phenylalanine.

Tyrosine has several functions in the body, including: [9]

- It is one of the few amino acids that are the building blocks of proteins.
- It participates in the structure of almost all proteins in the body.
- It is a precursor to the neurotransmitters epinephrine, norepinephrine, and dopamine.
- Helps produce melanin, the pigment responsible for hair and skin color.[10]
- It helps in the production of hormones in the adrenal, pituitary and thyroid glands.

Tyrosine is found in the foods we eat. Therefore, most people get tyrosine only from their diet. The estimated amino acid requirement for phenylalanine and tyrosine for adults is 14 mg/kg body weight per day.[11]

Table 2. Plants rich in Tyrosine, necessary for the synthesis of thyroid hormones, and their amount

Name of the product		Tyrosine content in g per 100 g of product	The level of coverage of daily needs (in percentage)
1	Soybean insulation	3.2	73.2
2	Soybean concentrate	2.3	52.3
3	Soybean protein	2.2	49.3
4	Pumpkin seeds without husk	1.1	24.8
5	Unroasted peanuts	1	23.8
6	Walnut	1	23.8
7	Crushed mustard seeds	0,8	18.4
8	Sunflower seeds without peels	0,7	15.1
9	Cumin seeds	0,6	14.6
10	Dried Peas	0,5	11.6

Conclusion. In order to activate thyroxine harmony, the drugs Thyroid Health Formula, Thyroxine and Thyroid Energy added L-thyroid in various therapeutic quantities. Potassium iodide is used as the main active substance in most medicines used to prevention and treat iodine deficiency. As an organic compound form of iodine, drug preparations and BAA contain mainly L-thyroxine sodium salt, iodine, and seaweed extracts are used.

Drugs that contain inorganic compounds of iodine are rapidly affected by rapid sorbing in the human body, but most of them may experience allergic arousal, various skin diseases, diarrhea, nausea, vomiting, and shock, tachycardia, irritation, and sleep disorders in patients over the age of 40.

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