Journal of Chemistry of Goods and Traditional Medicine

J Chem Good Trad Med, Volume 3, Issue 1, 2024 Traditional Medicine

INFLUENCE OF IODINE DEFICIENCY ON THE FETUS AND METHODS OF TRADITIONAL MEDICINE FOR ITS PREVENTION

Obidjon Sh. Abdulloev
Andijan State University, Acting Professor of the Department of Chemistry, Doctor of Chemical Sciences (DSc), member of the Tabobat Academy of Uzbekistan
https://orcid.org/0000-0003-2289-1273

Ziyodulloh N. Razzakov
Andijan State University, basic doctoral student
E-mail: ziadrazzakov@gmail.com
https://orcid.org/0009-0003-8318-3585

Kobiljon K. Otakhonov
Andijan State University, Head of the Department of Chemistry, Doctor of Philosophy in Chemistry (PhD), associate professor
https://orcid.org/0009-0004-4819-2934

Ibragim R. Askarov
Andijan State University, Doctor of Chemical Sciences, Professor, Honored Inventor of Uzbekistan, Chairman of the TABOBAT Academy of Uzbekistan
https://orcid.org/0000-0003-1625-0330

DOI: https://doi.org/10.55475/jcgtm/vol3.iss1.2024.266

Keywords:
mineral iodine, organic iodine, thyroid gland, pregnancy period, dietary supplements, thyroid hormone

Abstract

Iodine metabolism is a very complex biochemical process, and the trace element iodine enters the human body in two forms: mineral iodine and organic iodine. The chemical composition of some synthetic drugs used for the treatment and prevention of widespread iodine deficiency in the territory of the Republic of Uzbekistan was studied with the help of literature and their possible negative effects on the human body were presented. When these iodine-preserving modern drugs are taken parenterally, if attention is paid to their pharmacokinetics, after absorption in the stomach and small intestines, they are absorbed into the blood circulation system through the liver, and a negative effect on liver cells is observed.

How to Cite

Abdulloev, O. S., Razzakov, Z. N., Otakhonov, K. K., & Askarov, I. R. (2024). INFLUENCE OF IODINE DEFICIENCY ON THE FETUS AND METHODS OF TRADITIONAL MEDICINE FOR ITS PREVENTION. Journal of Chemistry of Goods and Traditional Medicine, 3(1), 287–302. https://doi.org/10.55475/jcgtm/vol3.iss1.2024.266

Introduction. As a result of neglecting the level of consumption of the iodine element contained in food products, the thyroid gland becomes enlarged due to disturbances in the secretion of the thyroxine hormone. For this, first of all, it is necessary to prevent iodine deficiency in the body [1]. According to the World Health Organization, about 700 million of the world's population have endemic goiter. Iodine deficiency diseases are more common in women than in men. Especially in women, in the first weeks of pregnancy, the lack of this microelement begins to have a negative effect on the formation and development of the fetus [2].

Therefore, on January 26, 2022, the decision of the President of the Republic of Uzbekistan No. PQ-102 "On measures to improve and expand the scope of the endocrinology service" was adopted. The purpose of the decision is to create an effective and modern system of endocrinological care for the population, to improve diseases and their prevention, to improve the quality of providing high-quality endocrinology care to the population, and to increase the capacity of medical workers in this direction [3].

It is known that the main natural sources of iodine are plant and animal products, drinking water, and it ensures the full development and functioning of the body as it is an important component of thyroid hormones. The mineral form of iodine is potassium or sodium iodide, iodide salts, and the organic form of iodine refers to the form of iodine bound to organic compounds such as carbohydrates or amino acids. Mineral iodine is very fast in the body, bioaccumulation of organic iodine occurs slowly. However, scientists admit that organic compounds of iodine are harmful to the human body. The body's daily need for this element is shown in the table below:

Table 1.

№	Period	Daily request
1	Up to 5 years	90 mcg
2	From 5 up to 12	120 mcg
3	12 years and above	150 mcg
4	Pregnancy and breastfeeding	250 mcg

If the amount of iodine trace element in the soil is insufficient, it will lead to a low amount of it in the fruits and vegetables of that area, and this will lead to iodine deficiency diseases among the population [3]. As a result of iodine deficiency, many negative consequences are observed in the formation and development of the human body. Especially, the greatest risk is during pregnancy, and if the mother's body lacks iodine, it leads to negative situations in the normal formation of the baby's body. During pregnancy, the baby's thyroid gland begins to retain iodine in the body only when it reaches 10-12 weeks, and the synthesis of thyroid hormones is observed from 15 weeks.

Iodine is a micronutrient required for humans and other mammals only for the production of thyroxine (T4) and triiodothyronine (T3). These hormones are collectively described as Thyroid hormones because of their origin in the thyroid gland. Distribution of T4 through the circulatory system is widespread, but requires carrier proteins such as thyroxine-binding globulin, transthyretin, and albumin to overcome its poor solubility [5]. Thyroid hormones are essential during early development and throughout life. In young children, iodine deficiency, insufficient thyroid function, or poor response to thyroid hormone can cause physical and mental disorders, leading to cretinism in the most severe form [6, 7].

For example, for thyroid hormones to perform their function, iodine is important as its component, and between 12-15 weeks of the baby's period, which is the period of formation of the central nervous system, iodine deficiency in the mother's body leads to low memory of the child. The following table shows the negative consequences of iodine deficiency in the mother's body during the fetal period of the baby:

Pathological conditions observed in the fetus due to iodine deficiency in the mother's body

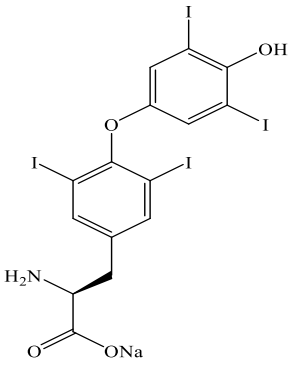
- Mental illness
- Deafness
- Hypothyroidism

- Deafness and muteness
- Mental retardation
- Congenital anomaly
- Stillbirth of a baby
- Abortion

Mothers need to determine the amount of thyroid hormones periodically through biochemical analyzes in order to prevent thyroid diseases during pregnancy. In order to prevent the disease, they should pay close attention to the consumption of fruits and vegetables rich in iodine along with vitamins and food products rich in iron. The fact that pregnant women do not regularly consume the products recommended by specialists is one of the causes of the disease, for example, only 20% of women take natural folic acid regularly [7].

In the treatment of hypothyroidism, synthetic drugs such as "Yodomarin", "Yodbalans", "Antistrumin" and "Yodeks" are used. The active component of these drugs is inorganic iodine (KJ), which is well absorbed in the digestive system, but has some negative effects, like all synthetic drugs. Among them, "Yodoform" drugs have been found to cause allergic diseases, hives, fever and various skin diseases in patients.

Table 2.

№	Name of medicine	Formula of active compound	Appearance	Side effects	Country of manufacture
1	**Yodomarin**	KJ		Hypersensitivity, Iodine dermatitis	Berlin Chemie AG (Germany)
2	**Tezarin**			Arrhythmia Tachycardia Angina	Insuphar Laboratories (Turkiye)
3	**Yod Ask**	KJ		Iodine rhinitis Iodine dermatitis hyperthyroidism	Nika Pharm (Uzb)
4	***L*- Tiroksin**	KJ		Allergic agitation	Berlin Chemie AG (Germany)
5	**Yodofol**	KJ		Allergic reactions	Kendy LTD (Bulgaria)
6	**Antistrumin**	KJ		Hyperthyroidism	SAMO, OOO (Uzb)

7	**Yodandin**	KJ		Shock, tachycardia, nervousness,	Biodek MFPDK (Rossiya)
8	**Yodid Formak**	KJ		Iodine dermatitis, angioedema	Pharmak, PAO (Ukrain)
9	**Yod Vitrum**	KJ		Kidney failure	Unipharm Inc (Europe)

As a result of studying the characteristics of modern iodine-preserving preparations, it was found that the side effects of the representatives whose active ingredient is inorganic iodine are higher than those of organic iodine-preserving preparations. Compared to modern medicines containing organic iodine, it was found that drugs with potassium iodide as the main active ingredient have more side effects on patients and cause one or more additional diseases in addition to the existing ones.

One of the natural healing food supplements prepared on the basis of folk medicine methods is "Askalsiy", which is a chemical composition of organic iodine-preserving natural medicinal products. It is a biologically active compound rich in folic acid, easily absorbed calcium, and minerals. Another important advantage of the dietary supplement "Askalsiy" over other synthetic iodine-sparing preparations is that it is harmless because it is a natural agent. "Alkaman" dietary supplement has been scientifically proven to contain iodine [9], and has been used for the prevention and treatment of hypothyroidism in women for several years, proving to be a very reliable natural remedy.

According to their chemical composition, "Iodomarin", "Yodask", "Iodofol", "Anistrumin", "Iodine Farmak" and "Iodine Vitrum" are synthetic inorganic iodine preservatives. Due to its rapid absorption, excessive intake can lead to serious diseases and even death.

The disease can be prevented and treated using folk medicine methods at home. Below we give some instructions [1];

1. After taking 2 spoons of Ziziphora and putting it in 400 ml of boiling water in the evening, strain it in gauze in the morning and consume half a glass 4 times a day an hour before meals.

2. Drinking Potentilla recta as a tea is beneficial.

3. It is possible to effectively satisfy the body's need for iodine element by preparing and eating various salads from sea cabbage.

4. We recommend preparing and eating different salads from one or two pieces of date fruit, a few walnut kernels or lemons (with peel) a day.

5. Organize a meal with fish and fish products one day a week.

At this point, it should be noted that the longest-lived people in the world and the highest overall mental capacity are the Japanese, who, according to scientists, constantly consume a lot of seafood. and use of medicinal plants for continuous growth [10]. By following the above recommendations, goiter during pregnancy can be prevented. By neglecting the body's demand for iodine, gout can lead to bad consequences.

Summary. As a result of studies, it was found that synthetic iodine-sparing drugs lead to the development of hypokalemia during therapy in patients with kidney failure. In other words, it is observed that patients who have chronically consumed these synthetic drugs will excrete the

necessary potassium ions from their body through urine. As a result of this, hypokalemia occurs in patients[9].

We propose to conduct scientific research in the field of thyroid gland diseases and to develop new natural food additives for the purpose of prevention and treatment of these diseases and to put them into practice.

References

1. Асқаров И.Р. Сирли табобат. Тошкент, Фан ва технологиялар нашриёт матъбаа-уйи. - 2021 й. – 1056 б.
2. Павлюкова С. А., Сидоренко В. Н., Кириллова Е. Н. Раболевания щитовидной железы и беременность. Учебно-методическое пособие. Минск БГМУ 2019. Стр – 5-8.
3. Lex.uz. 2022-yil 26-yanvarda №PQ-102 “Endokrinologiya xizmatini takomillashtirish va ko’lamini kengaytirish chora tadbirlari to’g’risida” Prezidentning qarori https://lex.uz/uz/docs/-5838968
4. Zimmermann M.B., Jooste P.L., Pandav C.S. Iodine-deficiency disorders. Lancet. 2008; 372(9645):1251-1262. doi: 10.1016/s0140-6736(08)61005-3
5. Hernandes MZ, Cavalcanti SMT, Moreira DRM, de Azevedo WF Jr, Leite ACL. Halogen atoms in the modern medicinal chemistry: hints for the drug design. Curr Drug Targets 2010;11 (3):303–314.
6. Deltour G, Binon F, Tondeur R, Goldenberg C, Henaux F, Sion R, Deray E, Charlier R. Studies in the benzofuran series. VI. Coronary-dilating activity of alkylated and aminoalkylated derivatives of 3-benzoylbenzofuran. Arch Int Pharmacodyn Thir 1962;139:247–54.
7. Wiersinga W.M. Pharmacotherapeutics of the thyroid gland. In: Weetman AP, Grossmann. Handbook of Experimental Pharmacology (HEP, volume 128)
8. Фадеев В.В., Давыдова Г.Н. Оптимальное потребление йода детьми и женщинами во время беременности и лактации: практические рекомендации // ВЕСТНИК Репродуктивного Здоровья. – декабрь 2008. – С. 45
9. Левченко А., Андрейчук О.Ю. Развитие в условиях недостатка йода в пище и воде. - Калуга. - 2012. - Стр.12
10. Мўминжонов М.М. Ўсимлик чиқиндилари асосида янги биологик фаол озиқ-овқат қўшилмалари олиш ва уларнинг кимёвий таркиби. Кимё фанлари доктори (DSc) илмий даражасини олиш учун тайёрланган Диссертация. Андижон – 2022. 129 – б.