

6. Obesity paradox in cancer: new insights provided by body composition / M.C. Gonzalez, C.A. Pastore, S.P. Orlandi, S.B. Heymsfield // *Am J Clin Nutr.* – 2014. – № 99. – P. 999–1005.
7. The global burden of cancer: priorities for prevention / M.J. Thun, J.O. DeLancey, M.M. Center [et al.] // *Carcinogenesis.* – 2010. – № 31. – P. 100–110.
8. Ramos – Nino, M.E. The role of chronic inflammation in obesity – associated cancers / M.E. Ramos – Nino // *ISRN Oncol.* – 2013. – № 1. – P. 25.
9. Corrêa, L.H. The impact of the adipose organ plasticity on inflammation and cancer progression / L.H. Corrêa, G.S. Heyn, K.G. Magalhaes // *Cells.* – 2019. – № 8. – P. 662.
10. The ambiguous role of obesity in oncology by promoting cancer but boosting antitumor immunotherapy / J.A.F. Assumpção, G. Pasquarelli – do – Nascimento, M.S.V. Duarte [et al.] // *J Biomed Sci.* – 2022. – Vol. 29, № 1. – P. 12.
11. Pathophysiology of obesity and its associated diseases / X. Jin, T. Qiu, L. Li [et al.] // *Acta Pharm.* – 2023. – № 13. – P. 2403–2424.
12. Pati, S. Obesity and Cancer: A Current Overview of Epidemiology, Pathogenesis, Outcomes, and Management. / S. Pati, W. Irfan, A. Jameel // *Cancers (Basel).* – 2023. – Vol. 15, № 2. – P. 485.
13. Kolb, R. Obesity and cancer: inflammation bridges the two / R. Kolb, F.S. Sutterwala, W. Zhang // *Curr Opin Pharmacol.* – 2016. – № 29. – P. 77–89.
14. Khaza'ai, H. Obesity and inflammation: the linking mechanism and the complications / H. Khaza'ai, A. Rahmat, Y. Abed // *Arch Med Sci.* – 2017. – № 4. – P. 851–863.
15. Agnew, H. Interventions for weight reduction in obesity to improve survival in women with endometrial cancer // H. Agnew, S. Kitson, E.J. Crosbie // *Cochrane Database Syst Rev.* – 2023. – Vol. 3, №3. – P. CD012513.
16. Overweight, Obesity, and Mortality from Cancer in a Prospectively Studied Cohort of U.S. Adult / E.E. Calle, C. Rodriguez, K. Walker – Thurmond, M.J. Thun // *The New England Journal of Medicine.* – 2003. – № 348. – P. 1625 – 1638.
17. Bergstrom, A. Overweight as an avoidable cause of cancer in Europe / A. Bergstrom, P. Pisani, V. Tenet // *Int J Cancer.* – 2001. – № 91. – P. 421 – 430.
18. Association Between Obesity and Risk of Total and Obesity-Related Cancer in People with Incident Cardiovascular Disease. / S. Malik, A. Guha, X. Wang [et al.] // *Journal of the American Heart Association.* – 2024. – Vol. 13, № 17. – P. e034438.
19. Kantapan, J. High – Fat Diet and Altered Radiation Response / J. Kantapan, T. Katsube, B. Wang // *Biology.* – 2025. – № 14. – P. 324.
20. Role of adipose tissue in melanoma cancer microenvironment and progression. / E. Zoico, E. Darra, V. Rizzatti [et al.] // *Int J Obes (Lond).* – 2018. – Vol. 3, № 42. – P. 344 – 352.

Сведения об авторах

С.М.С.М. Хасбелнаби – студент

Е.Ю. Сергеева – доктор медицинских наук, профессор

О.А. Гаврилюк* – кандидат педагогических наук, доцент

Information about the authors

S.M.S.M. Hasbelnabi – Student

E.Yu. Sergeeva – Doctor of Science (Biology), Professor

O.A. Gavriluk* – Candidate of Sciences (Education), Associate Professor

*Автор, ответственный за переписку (Corresponding author):

oksana.gavriluk@mail.ru

УДК: 616 – 092.12

ПРОБЛЕМА ДЕФИЦИТА ВИТАМИНА D В УРАЛО – СИБИРСКОМ РЕГИОНЕ И СПОСОБЫ ЕЁ РЕШЕНИЯ

Черняева Лада Максимовна, Ушакова Мария Николаевна, Мунина Ирина Вячеславовна

Кафедра иностранных языков и межкультурной коммуникации

ФГБОУ ВО «Уральский государственный медицинский университет» Минздрава России

Екатеринбург, Россия

Аннотация

Введение. Более половины населения планеты испытывает нехватку витамина D. Это связано не только с недостатком солнца, но и с особенностями питания, возрастными изменениями и состоянием здоровья. **Цель исследования** – изучить, могут ли БАДы или солярий повысить содержание витамина D в организме человека также эффективно, как и медицинские препараты, выписанные врачом. **Материал и методы.** В исследовании был использован метод – эксперимент. В исследовании приняли участие жители г. Екатеринбурга одного возраста, пола и с одинаковой группой здоровья. Исследование проводилось с 02.12.2024 по 02.03.2025. **Результаты.** В ходе эксперимента получены результаты и сделан вывод о том, что БАДы и солярий менее эффективны, по сравнению с эффективностью медицинских препаратов, для повышения уровня витамина D в крови. **Выводы.** Из полученных результатов можно сделать следующие заключение: эффективнее всего уровень витамина D в организме можно поднять с помощью медикаментозных препаратов. БАДы хуже всех справились со своей задачей, поэтому, если нет нужды идти к специалисту, эффективнее посещать солярий.

Ключевые слова: гипervитаминоз, гиповитаминоз, витамин D, заболевание, исследование, норма, дефицит, недостаточность.

THE ISSUE OF VITAMIN D DEFICIENCY IN THE URAL – SIBERIAN REGION AND METHODS OF SOLVING IT

Chernyaeva Lada Maksimovna, Ushakova Maria Nikolaevna, Munina Irina Vyacheslavovna
Department of Foreign Languages and Intercultural Communication
Ural State Medical University
Yekaterinburg, Russia

Abstract

Introduction. More than half of the world's population is deficient in vitamin D. This is due not only to a lack of sun, but also to dietary patterns, age – related changes, and health conditions. **The aim of the study** is to determine whether dietary supplements (DS) or tanning beds can increase vitamin D levels in the human body as effectively as physician – prescribed medications. **Material and methods.** The experimental method was used in the study. The study involved residents of Yekaterinburg of the same age, gender and with the same health group. The study was conducted from 02.12.2024 to 02.03.2025. **Results.** As a result of the experiment, the results were obtained and it was concluded that dietary supplements and tanning beds are less effective, compared with the effectiveness of medications, to increase the level of vitamin D in the blood. **Conclusions.** The following conclusions can be drawn from the results obtained: The most effective way to raise the level of vitamin D in the body is with the help of medications. Dietary supplements did the worst job of all, therefore, if there is no need to go to a specialist, it is more effective to visit a solarium.

Keywords: hypervitaminosis, hypovitaminosis, vitamin D, disease, research, norm, deficiency, insufficiency.

INTRODUCTION

More than half of the world's population is deficient in vitamin D. This is due not only to a lack of sun, but also to dietary patterns, age – related changes, and health conditions.

The primary source of vitamin D is sunlight. There are also numerous natural foods that inherently contain this essential vitamin. These foods are further advantageous as they provide a range of other vital nutrients. Thus, by regularly incorporating them into one's diet, it is possible to achieve optimal levels of this vitamin in the body.

What foods contain vitamin D?

Some of the richest foods in vitamin D include:

- fatty fish (such as herring, salmon and mackerel)
- meat (particularly organ meats) and meat products
- egg yolks
- fortified foods.

Some mushrooms are also natural sources of vitamin D, but the content varies on the amount and duration of UV – B light exposure, during growth and/or production [1].

Hypervitaminosis refers to an excess of a particular vitamin in the body. An excess of vitamin D develops very slowly. Hypervitaminosis is rare in people, especially those living in the Ural – Siberian region. However, if excessively high doses of vitamin D are taken, the surplus can lead to calcium metabolism disorders, which in turn may cause hypercalcemia, and subsequently hypercalciuria, a more severe form of hypercalcemia.

Hypercalcemia is defined as an increase in the concentration of total calcium in the blood serum above 2.8 mmol/L or ionized calcium above 1.3 mmol/L.

Hypovitaminosis (or avitaminosis) refers to a deficiency of a particular vitamin in the body. Vitamin D affects most body systems and is important to overall health. Symptoms of a vitamin D deficiency can include muscle weakness, fatigue, and hair loss. Vitamin D deficiency is the most common nutritional deficiency in the world. BMJ Best Practice. Vitamin D deficiency – symptoms, diagnosis and treatment.

A deficiency in vitamin D may develop if you don't receive enough vitamin D due to your diet or exposure to sunlight. In addition, some health conditions and medications make it harder for the human body to produce vitamin D [2].

Severe vitamin D deficiency in children can cause rickets, a condition that leads to:

- BMJ Best Practice. Vitamin D deficiency – symptoms, diagnosis and treatment.
- Bone deformities
- Stunted growth

- Fragile bones that are easily fractured

In adults, severe vitamin D deficiency can lead to:

- Osteomalacia: Softening of the bones, which is the adult version of rickets
- Osteopenia: Low bone density, a precursor to osteoporosis
- Osteoporosis: A condition characterized by weak, brittle bones that are easily fractured

Vitamin D deficiency is also associated with chronic diseases that may include:

- Cancer
- Heart disease
- Diabetes
- Immune system diseases
- Neuropsychiatric disorders [3].

Ways to increase vitamin d in the body. There are not many ways to increase the amount of vitamin D in the blood. First of all, it is necessary to stay outdoors for at least 30 minutes a day. But what if there's not enough time for walking? In this case, you can visit the solarium, but more than twice a week. It is necessary to take a break between sessions for at least 48 hours. This will be enough, because frequent visits can lead to the appearance of age spots on the skin, as well as provoke the appearance of acne.

Dietary supplements can also be purchased at the pharmacy [4].

Dietary supplements are biologically active additives. They consist of natural active substances. They are intended to be taken before meals, in order to enrich the diet with individual food or biologically active substances.

However, the most effective way is to take medications prescribed by a specialist. If, after visiting a doctor, vitamin D deficiency has been detected and medications have been prescribed, it is worth starting to take them in the necessary doses, which should also be clarified by the doctor.

The relevance is in the prevention of vitamin D hypovitaminosis. Many people suffer from a deficiency of this vitamin because the climate in the Ural – Siberian region is unsuitable: there is little sunlight on the skin.

The aim of the study is to determine whether dietary supplements (DS) or tanning beds can increase vitamin D levels in the human body as effectively as physician – prescribed medications.

MATERIAL AND METHODS

There are many ways to increase vitamin D levels in the body, but which one is the most effective? A study was conducted to verify this.

The experimental method was used in the study.

The study involved a group of 4 participants living in the Ural – Siberian region. All participants were of the same age and had the first health group. The study was conducted from 02.12.2024 to 02.03.2025. The duration of the study is three months.

The measurement technique for determining the vitamin D content in the blood includes several stages:

1. Patient preparation.

The patient is explained the purpose of the study and the blood sampling procedure itself. It is recommended to donate blood on an empty stomach (8 – 12 hours without food). It is necessary to drink water.

2. Equipment preparation.

Sterile disposable instruments (needles, test tubes, cotton swabs, antiseptics) are used.

3. Blood sampling.

The health worker applies a tourniquet above the sampling site, treats the skin with an antiseptic, inserts a needle and draws blood into a test tube. 3 – 5 ml of blood is required.

4. Sample processing.

The test tube with blood is centrifuged to separate the serum.

5. Laboratory analysis.

Method: Immunochemiluminescent assay or liquid chromatography – mass spectrometry are most often used to determine the level of vitamin D.

Measurement: The concentration of 25 – hydroxyvitamin D (25(OH)D), which is the main marker of vitamin D status in the body, is analyzed.

6. Interpretation of results.

7. Documentation.

The test results are recorded in the patient's medical record. If necessary, the doctor interprets the results and prescribes treatment or dietary adjustments.

RESULTS

At the first stage of the experiment, each subject underwent blood tests to check the vitamin D content in the body. Optimal blood vitamin D levels are generally between 30 ng/ml and 60 ng/ml [5].

The following results were obtained:

Person X – 11 (ng/ml) – deficiency

Person Y – 20 (ng/ml) – insufficiency;

Person Z – 12 (ng/ml) deficiency;

Person C – 12 (ng/ml) deficiency.

At the second stage of the study, over the course of three months, the subjects increased the level of vitamin D in their blood in three different ways:

Person X took medications prescribed by a doctor;

Person Y – visited the solarium 2 times a week;

Person Z – took dietary supplements (1);

Person C took dietary supplements (2).

At the third stage, each participant in the study repeated blood tests to monitor changes in vitamin D levels in the body.

Person X – 48 (ng/ml) – is the norm;

Person Y – 50 (ng/ml) – is the norm;

Person Z – 24 (ng/ml) – insufficiency;

Human C – 22 (ng/ml) – insufficiency.

It turned out that in person X, who took medical drugs, the result increased by 37 units ($48 - 11 = 37$).

In person Y, who visited a solarium, the result increased by 30 units ($50 - 20 = 30$).

In person Z, who took dietary supplements (1), the result increased by 12 units ($24 - 12 = 12$).

In person C, who took dietary supplements (2), the result increased by 10 units ($22 - 12 = 10$).

DISCUSSION

The results of this study confirm the presence of a significant vitamin D deficiency among the population of the Ural – Siberian region, which is consistent with other data presented in the domestic and foreign literature. For example, studies conducted in other northern regions of Russia also revealed a high prevalence of hypovitaminosis D, which is associated with a lack of sunlight and dietary characteristics.

Limitations and disadvantages of the study:

1. Sample. The study was conducted on a limited sample, which may reduce the representativeness of the results.

2. Lack of long – term follow – up. The study did not include long – term follow – up of the participants, which does not allow us to assess the dynamics of vitamin D levels and the effectiveness of the proposed measures.

Advantages of the study.

1. Regional specificity: The study takes into account the unique climatic and social conditions of the Ural – Siberian region, which makes its results more relevant to the local population.

2. Practical focus: The results of the study can be used to develop regional programs for the prevention and correction of vitamin D deficiency.

The data obtained can be used for:

1. Developing recommendations. Creating regional recommendations for the prevention and treatment of vitamin D deficiency, taking into account local characteristics.

2. Planning research. Conducting larger – scale and long – term studies to assess the effectiveness of various strategies for correcting vitamin D deficiency.

This study contributes to the understanding of the problem of vitamin D deficiency in the Ural – Siberian region and offers practical solutions that can be applied both in scientific research and in clinical practice.

Interpretation of the effectiveness of vitamin D deficiency correction methods. Given the identified vitamin D deficiency in the Ural – Siberian region, practical experience with various methods of replenishing it shows varying effectiveness:

1. Medications (most effective).

Proven highly effective due to precise dosage of the active substance.

Quickly normalize vitamin D levels, especially in cases of severe deficiency.

2. Ultraviolet radiation (moderate effectiveness).

Visiting a solarium or UV lamp gives a moderate result, since:

Depends on skin type, duration and frequency of exposure.

In northern regions, even artificial UV does not always compensate for the lack of natural sun.

There are risks: potential harm from excessive radiation (photoaging, risk of melanoma).

3. Dietary supplements (least effective).

Weakly helped due to low dosages of the active substance.

Lack of strict quality control in production, unlike drugs

Suitable only for the prevention of mild deficiency.

CONCLUSIONS

The following conclusions can be drawn from the results obtained: The most effective way to raise the level of vitamin D in the body is with the help of medications. Dietary supplements did the worst job of all, therefore, if there is no need to go to a specialist, it is more effective to visit a solarium.

(It is important to remember that each organism is different and can perceive certain drugs in different ways).

LIST OF REFERENCES

1. Taylor, P.N. A review of the growing risk of vitamin D toxicity from inappropriate practice / P.N. Taylor, J.S. Davies // *Br J Clin Pharmacol.* – 2018. – Vol. 6, № 84. – P. 1121 – 1127.
2. Trends in the use of high – dose vitamin D supplements exceeding 1000 or 4000 international units per day / M.R. Runy, L. Harnack, E.D. Michos, [et al.] // *JAMA.* – 2017. – Vol. 23, № 317. – P. 2448 – 2450.
3. How antiepileptic drugs can affect serum levels of vitamin D, calcium, and phosphorus in children with epilepsy / S. Saket, N. Varasteh, A.A. Asl Halimi, H. Saneifard // *Iran J Child Neurol.* – 2021. – Vol. 1, № 15. – P. 19 – 27.
4. Wimalawansa, S.J. Calcium and vitamin D in human health: hype or real? / S.J. Wimalawansa, M.S. Razzaque, N.M. Al – Daghi // *J Steroid Biochem Mol Biol.* – 2018. – № 180. – P. 4 – 14.
5. Galior, K. Development of vitamin D toxicity due to excessive correction of vitamin D deficiency: a review of case reports / K. Galior, S. Grebe, R. Singh // *Nutrients.* – 2018. – Vol. 8, № 10. – P. 953.

Сведения об авторах

И.В. Мунина – старший преподаватель

Л.М. Черняева* – студент

М.Н. Ушакова – студент

Information about the authors

I.V. Munina – Senior Lecturer

L.M. Chernyaeva* – student

M.N. Ushakova – student

*Автор, ответственный за переписку (Corresponding author):

lada8.8.8@mail.ru

УДК: 81.373.7

АНТОНИМИЧЕСКИЕ ПАРЫ В АНАТОМИЧЕСКОЙ ТЕРМИНОЛОГИИ

Елизавета Евгеньевна Агапова, Ольга Николаевна Анциферова

Кафедра иностранных языков и межкультурной коммуникации

ФГБОУ ВО «Уральский государственный медицинский университет» Минздрава России

Екатеринбург, Россия