BRITISH VIEW

MULTIDISCIPLINARY JOURNAL

British View ISSN 2041-3963 Volume 10 Issue 1 2025
Impact factor 8
Anthropologie, Applied Linguistics, Applied Physics, Architecture, Artificial Intelligence, Astronomy, Biological Sciences, Botany, Chemistry, Communication studies, Computer Sciences, Computing technology, Cultural studies, Design, Earth Sciences, Ecology, Education, Electronics, Energy, Engineering Sciences, Environmental Sciences, Ethics, Ethnicity and Racism Studies, Fisheries, Forestry, Gender Studies, Geography, Health Sciences, History, Interdisciplinary Social Sciences, Labour studies, Languages and Linguistics, Law, Library Studies, Life sciences, Literature, Logic, Marine Sciences, Materials Engineering, Mathematics, Media Studies, Medical Sciences, Museum Studies, Music, Nanotechnology, Nuclear Physics, Optics, Philosophy, Physics, Political Science, Psychology, Publishing and editing, Religious Studies, Social Work, Sociology, Space Sciences, Statistics, Transportation, Visual and Performing Arts, Zoology and all other subject areas.

Manuscripts typed on our article template can be submitted through our website here. Alternatively, authors can send papers as an email attachment to editor@britishview.co.uk
Editor Multidisciplinary Journals

Website: http://britishview.co.uk
Email: editor@britishview.co.uk

British View ISSN 2041-3963 Volume 10 Issue 1 2025
Impact factor 8

CHANGES IN VITAMIN D CONTENT DURING THE DEVELOPMENT OF EXPERIMENTAL ATHEROSCLEROSIS AND WAYS OF ITS CORRECTION

Nuraliyeva Z.S, Sabirova R.A.
Tashkent Medical Academy

Abstract: This article examines changes in vitamin D levels during the development of experimental atherosclerosis and approaches to its correction. The results showed that as atherosclerosis progressed, vitamin D levels decreased, reaching a minimum on the 60th day of the experiment (4.9 ± 0.5 ng/ml). In animals that received Levazo, vitamin D levels increased, whereas in groups treated with Thiocin, its levels decreased. However, higher doses of Thiocin (70 mg/kg) improved liver function, which contributed to better vitamin D metabolism. The combined administration of Levazo and Thiocin partially prevented the decline in vitamin D levels. Thus, statins may reduce vitamin D levels, but Thiocin, due to its hepatoprotective effect, partially compensates for this effect. Therefore, the combination of statins and Thiocin may be more effective in the treatment of atherosclerosis.

Keywords: Vitamin D, atherosclerosis, statins, Thiocin, Levazo, hepatoprotective effect, metabolism, blood serum.

Vitamin D is a fat-soluble vitamin that enters the body with food, although it is found in a very limited number of food products. It can also be synthesized in the skin under the influence of ultraviolet (UV) rays from sunlight. After undergoing two hydroxylation processes, vitamin D becomes active: the first stage occurs in the liver, converting vitamin D into 25(OH)D (25-hydroxyvitamin D), known as calcidiol; the second stage occurs in the kidneys, producing the physiologically active form, 1,25(OH)2D (1,25-dihydroxyvitamin D) [1].According to several researchers, vitamin D’s functions extend beyond calcium-phosphorus metabolism control. It also affects other physiological processes in the body, including cell growth modulation, neuromuscular conduction, immunity, and inflammation. A correlation has been established between vitamin D deficiency and the development of cardiovascular diseases and diabetes [2]. Lower vitamin D levels are associated with increased arterial stiffness, while maintaining normal levels can reduce the risk of atherosclerosis by half [3]. Increasing 25(OH)D concentrations to 30–60 ng/ml reduces the risk of obliterating atherosclerosis in the lower limb arteries by 80% [4].Cardiovascular diseases are the leading cause of mortality worldwide, with atherosclerosis—characterized by elevated cholesterol levels—being the primary contributor. Therefore, understanding vitamin D metabolism is crucial in addressing these diseases [5].

OBJECTIVE. The aim of this study was to examine changes in vitamin D levels during the progression of experimental atherosclerosis and its correction with Thiocin.

MATERIALS AND METHODS. Experimental atherosclerosis was induced by daily intragastric administration of cholesterol at a dose of 0.2 g/kg body weight for three months [6]. After this period, animals were divided into five groups:intact (normal) group, atherosclerosis group (experimental), levazo treatment group (0.057 mg/kg), thiocin treatment group (35 mg/kg), thiocin treatment group (70 mg/kg), combined Levazo + Thiocin treatment group.Groups 3, 4, and 5 received treatment for 30 days. All animals, except for the intact group, continued receiving cholesterol. Vitamin D levels in serum were measured using the Cobas e 411 analyzer (Switzerland).

RESULTS AND DISCUSSION. The study results on changes in vitamin D levels during the progression of experimental atherosclerosis are shown in the figure.

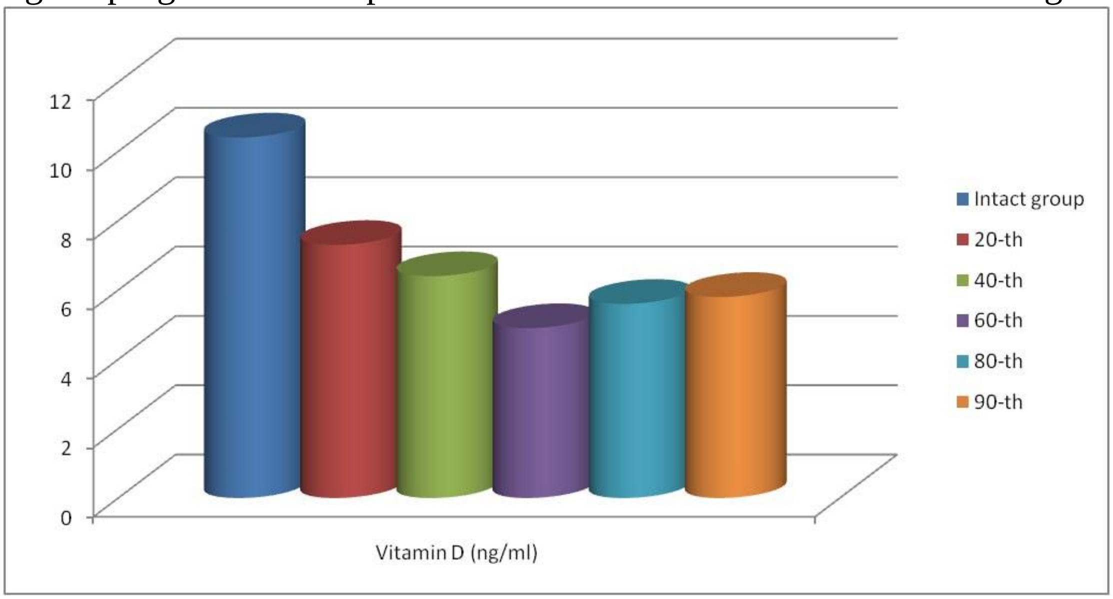

Figure.Changes in vitamin D levels (ng/ml) in blood serum during the development of experimental atherosclerosis (n=10)

As shown in the figure, vitamin D levels began to decline from the 20th day of the study. The most significant drop was observed on the 60th day of experimental atherosclerosis, reaching 4.9 ± 0.5 ng/ml.

Table

Effect of Thiocin on Vitamin D Content (ng/ml) in Blood Serum of Rabbits with Experimental Atherosclerosis (n=10)

Animal Group	Days of study		
	10th day	20th day	30th day
Intact Group	10,4 ± 0,6	10,4 ± 0,6	10,4 ± 0,6
Control Group	5,8 ± 0,05	5,8 ± 0,05	5,8 ± 0,05
Received Levazo	6,3 ± 0,05	6,7 ± 0,02	7,1 ± 0,01
Received Thiocin 35 mg/kg	5,6 ± 0,02	4,8 ± 0,01	3,9 ± 0,01
Received Thiocin 70 mg/kg	4,4 ± 0,02	4,3 ± 0,01	4,1 ± 0,02

Received Thiocin 70 mg/kg + Levazo	3,5 ± 0,01	4,1 ± 0,02	4,8 ± 0,01

Note: In all cases, $p < 0.05$ compared to the control group.

As seen in the table, animals that received Levazo showed a significant increase in vitamin D levels, by 15.5% and 22.4% on the 20th and 30th days, respectively, compared to the control group.

Thiocin at doses of 70 mg/kg and 35 mg/kg led to a decrease in vitamin D levels, particularly on the 30th day, by 32.76% and 29.3%, respectively, compared to the control group. At moderate doses, Thiocin had a hepatoprotective effect, while at higher doses, it improved liver function, facilitating better vitamin D metabolism.In animals receiving Thiocin in combination with Levazo, vitamin D levels were reduced by 17.3% compared to the control group. The most pronounced decline in vitamin D was noted on the 10th and 20th days (3.5 ± 0.01 and 4.1 ± 0.02 ng/ml, respectively).

The study results demonstrated that statins lower vitamin D levels, but Thiocin partially compensates for this effect due to its hepatoprotective properties. Therefore, in atherosclerosis treatment, combining statins with Thiocin provides better outcomes in terms of vitamin D levels compared to their separate use.

REFERENCES

1. Подзолков, В. И. Дефицит витамина D и сердечно-сосудистая патология / В. И. Подзолков, и соавт. // Терапевтический архив. – 2018. – №9. – С. 15-20.

2. Дедов, И. И. Клинические рекомендации. Дефицит витамина D: диагностика, лечение и профилактика / И. И. Дедов, Г. А. Мельниченко. – М.: Изд-во МГМСУ, 2014. – 105 с.

3. Mayer, O. Jr. The association between low 25-hydroxyvitamin D and increased aortic stiffness / O. Jr. Mayer, J. Filipovský, J. Seidlerová, et al. // Journal of Human Hypertension. – 2012. – Т. 26, №11. – С. 650-655. DOI: 10.1038/jhh.2011.94.

4. Holick, M. F. Vitamin D and Health: Evolution, Biologic Functions, and Recommended Dietary Intakes for Vitamin D / M. F. Holick // Clinic Reviews in Bone and Mineral Metabolism. – 2009. – Т. 7. – С. 2-19. DOI: 10.1007/s12018-009-9026-x.

5. Тара Уоррен, Ройзен МаКалистер , Эми Морган и др. Взаимозависимость и совместная регуляция метаболизма витамина d и холестерина// Клетки . 2021, 6 августа; 10(8): 2007. doi:10.3390/cells10082007.

6. Аничков, Н. Н. Новые данные по вопросу о патологии и этиологии атеросклероза / Н. Н. Аничков, С. С. Халатов // Русский врач. – 1913. – №8. – С. 184-186.

7. Warren, T. Interdependence and Co-Regulation of Vitamin D and Cholesterol Metabolism / T. Warren, R. McAllister, E. Morgan, et al. // Cells. – 2021. – Т. 10, №8. – С. 2007. DOI: 10.3390/cells10082007.