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Research on the correlation between nitrite and the pathogenesis of chronic diseases

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Abstract: *Excessive levels of nitrite in the body are the root cause of chronic diseases in medicine, mainly entering the body through food intake or other means. Therefore, excessive levels of nitrite in the body will cause a series of health problems. This article discusses the health effects of excessive nitrite levels in the body. Based on this, it further explores the clinical manifestations of excessive nitrite levels and chronic diseases, analyzes the correlation between nitrite levels and the pathogenesis of chronic diseases, proposes targeted prevention strategies, and provides new ideas for the effective prevention and treatment of chronic diseases.*

Keywords: *nitrite; chronic disease; Pathogenesis*

1. Introduction

The association between excessive nitrite levels in the body and the pathogenesis of chronic diseases has attracted widespread attention worldwide. Previous studies have shown that excessive nitrite levels may lead to a series of serious chronic diseases, such as cardiovascular disease, tumors, etc., but the specific pathogenesis is not yet fully understood. With the increasing demand for health, people are paying more and more attention to the impact of excessive nitrite levels on health, and hope to reveal its relationship with chronic diseases through in-depth research, providing scientific basis for prevention and treatment. Therefore, conducting research on the correlation between nitrite and the pathogenesis of chronic diseases is of great practical significance.

2. The impact of excessive nitrite levels on health in vivo

2.1 Health hazards caused by excessive nitrite levels in the body

The main sources of excessive nitrite in the body are vegetables, food, and water. That is to say, every bite of human food contains nitrite, which enters the body but is not decomposed. If it remains in the body, it is called excessive. When nitrite exceeds the limit in the body, it will cause serious health hazards to the human body.

Firstly, excessive nitrite levels can affect the transportation of oxygen in the blood, leading to insufficient oxygen supply and causing discomfort symptoms such as dizziness, headache, dry and blurred eyes. In severe cases, it can even lead to loss of consciousness. Secondly, nitrite can combine with amine substances in the body to form carcinogenic nitrosamines, increasing the risk of cancer, especially with a significantly higher incidence of digestive tract cancer. Thirdly, excessive nitrite levels are closely related to the occurrence and development of various chronic diseases, including hypertension, hyperlipidemia, hyperglycemia, heart disease, liver disease, kidney disease, etc.

2.2 Nitrite exceedance threshold and its relationship with disease risk

The International Medical Summit Forum specifically pointed out that nitrite levels exceeding 0.2-0.5g in the body will lead to more than 30 major diseases, indirectly affecting more than 200 diseases. Therefore, excessive nitrite levels in the body will be the root cause of a series of chronic diseases.

(1) Exceeding 0.2g or more in the body may cause a series of minor problems. For example, symptoms such as dizziness, headache, dry and blurred eyes, tinnitus and deafness, decreased memory, insomnia and dreaminess, chest tightness and shortness of breath, fatigue, mental fatigue, fatigue,

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numbness in limbs, fear of cold after winter, cold hands and feet, pale or pale complexion, dry skin, early white beard and hair, hair loss, cracked nails, and increased vertical lines.

(2) Exceeding 0.3g or more in the body may lead to a series of chronic diseases. Such as hypertension, hyperlipidemia, hyperglycemia, hyperuricemia, arrhythmia, heart failure, coronary heart disease, chronic gastritis, gastric ulcer, chronic bronchitis, bronchial asthma, bronchiectasis, chronic obstructive pneumonia, various bone diseases (such as rheumatic arthritis, rheumatoid arthritis, etc.), severe insomnia, chronic kidney disease, obvious increase in the number of night rises, frequency of urination, urgency of urination, endless urination, chronic enteritis, intestinal polyps, constipation, intestinal obstruction (at this time, blood has formed congee blood) and other symptoms (some people exceeding the standard are asymptomatic at present)

(3) If the body exceeds the standard by 0.4g or more, the blood is referred to as "plaque blood" in international medicine, which is prone to the formation of blood clots. The formation process is shown in Figure 1. Thrombosis refers to the blockage of blood vessels by blood plaques, which can lead to common types of severe embolism, such as cerebral embolism, myocardial infarction, pulmonary embolism, lower limb arterial embolism, deep vein thrombosis, and abdominal thrombosis.

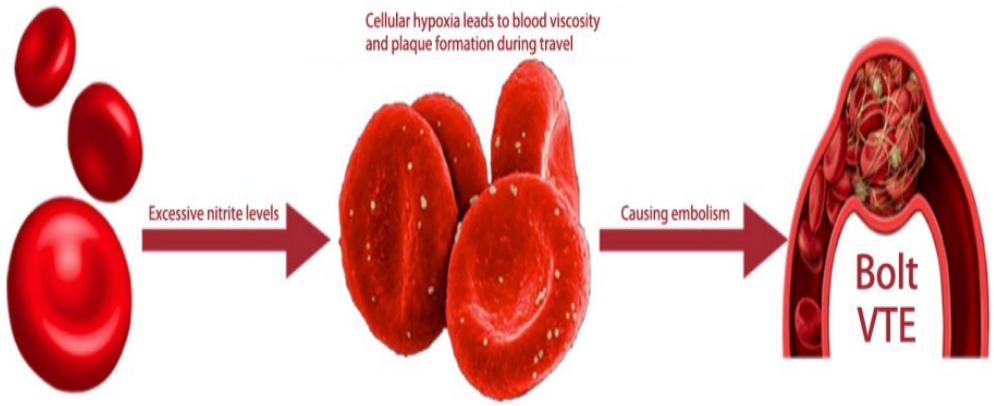

Figure 1: Schematic diagram of plaque formation in human blood vessels with excessive nitrite content

The common symptoms of pre thrombotic phase are as follows:

Firstly, there are signs of thrombosis in the cerebral blood vessels, such as dizziness, headache, insufficient cerebral blood supply, vomiting, limb weakness, numbness, epilepsy, and other symptoms. Secondly, the premonitions of myocardial infarction are often manifested as chest pain caused by insufficient coronary blood supply, chest tightness accompanied by sweating, breathing difficulties, radiating left shoulder and neck pain, pain symptoms in the left back, left shoulder, left arm, left facial teeth, as well as symptoms such as dizziness, headache, vomiting, limb weakness, limb numbness, epilepsy, etc. Thirdly, there are signs of pulmonary thromboembolism, including chest or upper back pain, accompanied by shortness of breath, accelerated heartbeat, dry cough, dizziness, and other symptoms. Due to untimely treatment of varicose veins, lower limb thrombosis occurs. The thrombus enters the deep vein and expands, causing plaque detachment and entering the lungs, leading to pulmonary embolism. Fourthly, deep vein thrombosis is more common in the lower limbs, mainly manifested as swelling, pain, muscle spasms, accompanied by redness, heat, and dryness of the skin. Fifthly, abdominal thrombosis mainly manifests as symptoms such as intestinal obstruction, indigestion, bloating, constipation, weight loss, bloody stools, and acute gastrointestinal bleeding.

(4) If nitrite exceeds 0.5g in the body, it will combine with amine substances in the body to form nitrosamines, which may cause various types of cancer, and its risk of developing cancer is more than 10 times higher than that of normal people.

If nitrite exceeds the limit in a certain organ in the body, that organ will cause a series of diseases in that organ, as shown in Figure 2[1].

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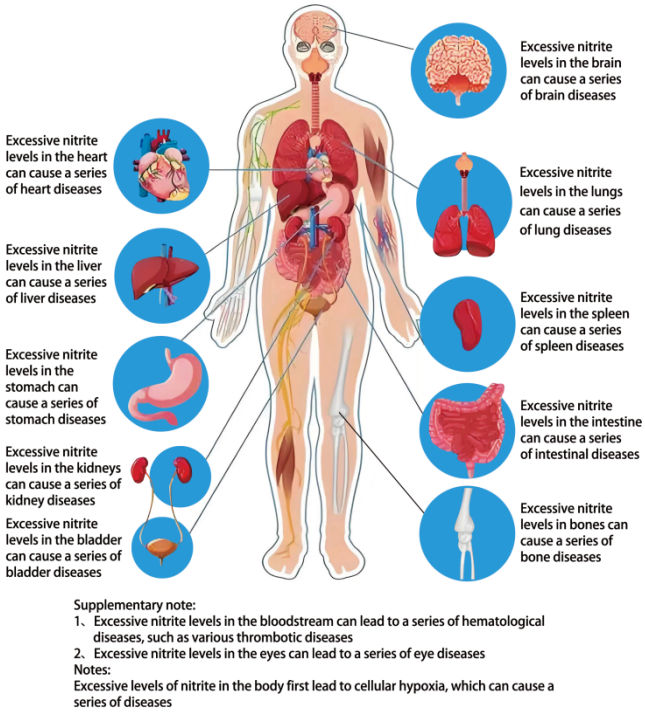

Figure 2: Abnormal nitrite levels in organs

3. Clinical manifestations of excessive nitrite levels and chronic diseases

3.1 Excessive nitrite levels and early symptoms and clinical manifestations of chronic diseases

Excessive nitrite levels are closely related to the early symptoms and clinical manifestations of chronic diseases, which are often precursors to the disease. In the case of excessive nitrite levels, early symptoms may include various physical discomforts and physiological abnormalities. For example, for the cardiovascular system, early symptoms may manifest as palpitations, chest tightness, etc., which often indicate insufficient blood supply to the heart or early onset of cardiovascular disease. Excessive nitrite levels may also cause symptoms of the digestive system, such as stomach discomfort, loss of appetite, indigestion, etc. These symptoms may be early manifestations of digestive system diseases such as gastritis and gastric ulcers. In terms of the nervous system, early symptoms may manifest as dizziness, headache, decreased memory, lack of concentration, etc., which may be early signals of neurological diseases. Excessive nitrite levels may also lead to immune system abnormalities, manifested as susceptibility to colds, recurrent infections, and other symptoms, indicating a decline in immune system function. For different chronic diseases, their early symptoms may vary, but excessive nitrite levels often serve as an important health risk factor.

3.2 Research on the correlation between excessive nitrite levels and the development of chronic diseases

Numerous clinical studies and epidemiological investigations have shown that excessive nitrite levels are an important risk factor for the development of many chronic diseases.

Firstly, excessive nitrite levels can directly damage the physiological functions of the human body, especially affecting the health status of important organs such as cardiovascular, digestive, and nervous systems. Secondly, excessive nitrite levels can trigger a series of biological metabolic reactions, induce the release of inflammatory factors in the body, accelerate the aging process, and lead to a decrease in the body's immune system, thereby increasing the risk of chronic diseases. For example, long-term nitrite excess may lead to abnormal vascular endothelial function, making the vascular wall unstable and prone to atherosclerosis, which may lead to hypertension, coronary heart disease and other cardiovascular diseases. Thirdly, excessive nitrite levels may also interfere with the balance of gut

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microbiota, increasing the risk of gastrointestinal diseases such as chronic gastritis and gastric ulcers. Fourthly, nitrite may also produce carcinogenic nitrosamines after metabolism in the body, increasing the likelihood of tumor occurrence, especially in digestive system tumors such as gastric cancer and esophageal cancer[2].

4. Exploring the correlation between nitrite and the pathogenesis of chronic diseases

4.1 Biological mechanisms of chronic diseases caused by excessive nitrite levels

The biological mechanism of excessive nitrite causing chronic diseases is a complex and multi-level process, involving the interaction of multiple biological systems. Firstly, nitrite is an electrophilic compound that can combine with amine substances in the body to produce carcinogenic nitrosamines. Nitrosamines cause DNA damage and mutations by interacting with DNA, leading to erroneous transmission of cellular genetic information and promoting the occurrence and development of tumors. Secondly, nitrite can also bind with heme in hemoglobin to form nitroso hemoglobin, which interferes with oxygen transport and utilization, leading to tissue hypoxia and exacerbating tissue and organ damage and lesions. Thirdly, nitrite produces a series of toxic metabolites during its metabolism in the body, which can damage cell membranes, proteins, and nucleic acids, leading to disruption of the intracellular environment and cell apoptosis. Nitrite is a highly active free radical that reacts non-specific with intracellular biomolecules, causing cell damage and inflammatory reactions, accelerating the degenerative changes of tissues and organs. Fourthly, nitrite can also interfere with the intracellular redox balance, inhibit the activity of antioxidant enzymes, increase cellular oxidative stress, lead to excessive accumulation of free radicals in cells, and induce cell damage and apoptosis [3].

4.2 The correlation between nitrite and cell damage and disease occurrence

The association between nitrite and cell damage and disease occurrence is a complex mechanism involving multiple biological processes. Firstly, nitrite is a strong oxidant that can directly damage biological macromolecules such as proteins and nucleic acids in cell membranes and organelles. Its mechanism of action is mainly through oxidative reactions with intracellular biomolecules, leading to changes in their structure and function, which can cause functional disorders and metabolic abnormalities in cells, thereby affecting the normal physiological functions of the entire tissue and organs. Secondly, nitrite can also induce cell apoptosis and necrosis by affecting intracellular signaling pathways and gene expression, altering cell survival and death signals, ultimately leading to self death or non programmed cell death, further exacerbating structural and functional abnormalities in tissues and organs, and promoting the occurrence and development of diseases. Thirdly, nitrite can also affect the redox balance within cells, leading to excessive accumulation of free radicals and a decrease in antioxidant capacity. It can trigger inflammation and apoptosis within cells, accelerate the degenerative changes of tissues and organs, and ultimately lead to the occurrence and development of chronic diseases.

4.3 Mechanism study on the relationship between excessive nitrite levels at the molecular level and the development of chronic diseases

At the molecular level, the mechanism of excessive nitrite levels and the development of chronic diseases involves multiple complex biological processes and molecular interactions. Firstly, nitrite can covalently bind with intracellular biomolecules, causing DNA damage and mutations, leading to genomic instability and abnormal gene expression, thereby affecting cell growth, differentiation, and apoptosis, ultimately promoting the development of chronic diseases. Secondly, the toxic substances and active carbon oxides produced during the metabolism of nitrite in the body can react with biological macromolecules to form carcinogenic substances such as DNA nitrosamines, which can directly damage DNA, induce cell carcinogenesis and the occurrence of tumors. At the same time, toxic substances can also regulate cell signaling pathways and gene expression, participate in inflammatory and immune responses, and thus affect the development of chronic diseases. Thirdly, nitrite can also covalently bind with proteins, leading to changes in protein structure and function, which may affect metabolic and signaling pathways within cells, ultimately affecting cell survival and function, and promoting the development of chronic diseases. Fourthly, nitrite may also affect the energy metabolism and redox balance of cells, affecting their energy supply and living environment, exacerbating their stress response and metabolic disorders, ultimately leading to the development of chronic diseases[4].

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5. Prevention and treatment strategies of nitrite and chronic diseases

5.1 Clinical findings show that L-alanine can effectively clear nitrite in the body

L-alanine plays an important role in the treatment of heart, brain, and liver diseases and the support of multiple physiological systems. It has a very good effect in clearing nitrite in the body and is one of the main components for clearing nitrite in the body.

Clinical studies have found that L-alanine not only clears nitrite in the body, but also plays an important role in the severe treatment of heart, brain, and liver diseases. In patients with heart, brain, and liver diseases, L-alanine can be used to assist in stabilizing blood pressure, assisting in stabilizing blood sugar, and providing cardiotonic therapy for patients with heart failure. It helps maintain the normal rhythm of the heart, reduces the burden on the heart, and provides support in cardiovascular emergencies, helping patients recover quickly. Secondly, L-alanine is also known as a powerful nutritional supplement, which helps to increase body energy and enhance the immune system. It is also an important component of the body's protein synthesis, helping to maintain tissue health and repair. Once again, L-alanine has a significant protective and improving effect on the nervous system. It can effectively inhibit the excitation of the central nervous system, have a calming and calming effect, and have a miraculous effect on insomnia caused by neurasthenia. Finally, L-alanine also has a positive impact on the circulatory system. It can soften blood vessels, increase their elasticity, and increase the blood supply to the heart and brain[5].

5.2 Intervention measures

The "Yaqing Tablets" developed by a well-known domestic enterprise in China, Junlian Peptide Kang, can effectively clear nitrite in the body. Its mechanism of action mainly includes the following aspects:

Firstly, the active ingredients in Yaqing tablets can react chemically with nitrite in the body, converting it into a very safe substance and excreting it from the body. Secondly, the components in Yaqing tablets help to reduce the absorption and adsorption of nitrite. This can be achieved by reducing the formation of nitrite in the digestive tract, thereby lowering its concentration in the body. Directly helps prevent nitrite accumulation to levels of health hazards. Thirdly, Yaqing tablets may have a positive impact on some related physiological processes, such as promoting the detoxification function of the liver. The liver is the main detoxifying organ of the body, which can help clear harmful substances. The ingredients of Yaqing tablets help to enhance the liver's detoxification ability, thereby helping to more effectively remove nitrite from the body.

The recommended medication and target audience for Yaqing tablets are shown in Table 1.

Table 1: Dosage of Yaqing Tablets

symptom	number of tablets taken
Cancer patients	6-8
Cancer patients undergoing radiotherapy and chemotherapy	6-8
Cardiovascular and cerebrovascular patients	2-4
Patients with liver disease and kidney disease	2-3
Patients with hypertension and hyperlipidemia	2-3
Patient with coronary heart disease	3-4
Patients with diabetes	2-3
Long term incurable patients	4-5
Patients with thromboembolic diseases	3-4
Patients with varicose veins	2-3
Patients with bone and joint diseases	2-3
Asymptomatic population (individuals with excessive nitrite levels in the body)	1-3
Population aged 60 and above	2-4

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6. Conclusion

In summary, the study of the correlation between nitrite and the pathogenesis of chronic diseases has important scientific significance and clinical value. In depth exploration of its impact mechanism can provide theoretical basis and technical support for the prevention and treatment of chronic diseases, and make greater contributions to ensuring human health. In future research, it is necessary to further explore the relationship between nitrite and chronic diseases, and strive to reveal its pathogenesis, making more contributions to human health.

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