THE EFFECTIVENESS OF HYDROGEN WATER AND HYDROGEN INHALATION IN THE TREATMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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Abstract: This article provides a brief description of the beneficial properties of active form hydrogen water and hydrogen inhalation, as well as their application features in chronic obstructive pulmonary disease. After a group of Japanese scientists studied the antioxidant, anti-apoptotic, cytoprotective, and anti-inflammatory properties of hydrogen, there was a significant increase in doctors' interest in studying its biological role. Special attention is given to the analysis of experimental and clinical research. The article provides information about the potential of hydrogen water and inhalation in chronic obstructive diseases and other conditions.

Keywords: antioxidant, hydrogen generator, active form hydrogen water.

Annotatsiya: ushbu maqolada faol shakldagi vodorod suvi va vodorod inhalatsiyasining foydali xususiyatlari, shuningdek, surunkali obstruktiv o'pka kasalligida ularni qo'llash xususiyatlari haqida qisqacha ma'lumot berilgan. Bir guruh Yapon olimlari vodorodning antioksidant, anti-apoptotik, sitoprotektiv va yallig'lanishga qarshi xususiyatlarini o'rgangandan so'ng, shifokorlarning uning biologik rolini o'rganishga bo'lgan qiziqishi sezilarli darajada oshdi. Eksperimental va klinik tadqiqotlarni tahlil qilishga alohida e'tibor beriladi. Maqolada surunkali obstruktiv kasalliklar va boshqa sharoitlarda vodorod suvining potentsiali va inhalatsiyasi haqida ma'lumot berilgan.

Kalit so'zlar: antioksidant, vodorod generatori, vodorod suvining faol shakli.

Аннотация: В данной статье дается краткое описание полезных свойств активной формы водородной воды и водородных ингаляций, а также особенностей их применения при хронической обструктивной болезни легких. После того, как группа японских ученых изучила антиоксидантные, антиапоптотические, цитопротекторные и противовоспалительные свойства водорода, интерес врачей к изучению его биологической роли значительно возрос. Особое внимание уделяется анализу экспериментальных и клинических исследований. В статье представлена информация о потенциале водородной воды и ингаляций при хронических обструктивных заболеваниях и других состояниях.

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Ключевые слова: антиоксидант, генератор водорода, активная форма водородной воды.

Research Methods: The research was conducted in the following areas: The study investigated the effects of hydrogen water and hydrogen inhalation on chronic obstructive pulmonary disease.

Research results: The study of the benefits of hydrogen water and hydrogen inhalation in active form began several years ago in several developed countries. In 2007, Professor Shigeo Ota, led by Professor Shigeo Ota, proved the biological antioxidant activity of hydrogen in the human body. In 2020, a group of Japanese researchers noted that drinking 500 ml of hydrogenated water per day for 2 weeks significantly increased aerobic efficiency and oxygen consumption. A group of Czech and Australian researchers proved that drinking hydrogenated water 30 minutes before exercise increases the efficiency of pulmonary ventilation and significantly reduces lactate levels. After several scientific studies, by 2021, more than 40% of the Japanese population and more than 30% of the South Korean population will regularly drink hydrogen water. For this, they use portable hydrogen generators. They also buy ready-made hydrogen water in packages.

The advantage of this substance (H_2) is that it quickly spreads in our body, penetrates into intercellular membranes, mitochondria, and, unlike many other antioxidants, it crosses the blood-brain barrier and penetrates into brain cells. The role of antioxidants, which has been shown by numerous clinical studies, is to selectively affect cytotoxic oxygen radicals, that is, to attack free radicals by capturing reactive oxygen species. An increase in free radicals usually begins to damage proteins, DNA and cell membranes in the body during the oxidative stress process, which leads to cell damage, decreased immune defenses and an increased risk of disease, premature aging of the skin. Molecular hydrogen has the potential to neutralize these free radicals and improve cellular health and overall well-being. Acting as a signal modulator, the hydrogen molecule activates the cellular defense system and the production of key antioxidant enzymes. These are glutathione, catalase, superoxide dismutase, which suppress inflammatory processes in the body. Molecular hydrogen teaches our body to protect itself. Its effect cannot be compared with any antioxidant product. Hydrogen is the nano antioxidant of the 21st century. It turns body cells into antioxidant "factories" and thus strengthens immunity.

There are several ways to get hydrogen into the body: through hydrogen inhalation, drinking hydrogen water, and taking hydrogen baths.

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Breathing 2-3% hydrogen gas for 30 minutes is equivalent to drinking 15 liters of hydrogen water. In its gaseous form, hydrogen is absorbed more quickly by the cells of the lungs, brain, heart, and other vital organs. In addition, breathing molecular hydrogen 3-4 times a week improves sleep quality and has a beneficial effect on a person's psycho-emotional state. Modern generators have a unique technology for saturating water with hydrogen. Hydrogen water at a therapeutic concentration of 1 ppm is considered an effective way to increase the energy level in the body, prevent premature aging in aesthetic medicine and slow down its process, increase endurance during physical activity, normalize metabolism and lose weight.

Chronic obstructive pulmonary disease (COPD) is a progressive debilitating respiratory disease characterized by chronic obstructive bronchitis and emphysema, leading to progressive deterioration of lung function. Since the increase in the number of patients with chronic obstructive pulmonary disease is a serious problem for the health system of countries, new research is currently being conducted all over the world to further improve its treatment and rehabilitation measures. In particular, the use of active hydrogen water and hydrogen inhalation, which are considered to be a strong antioxidant and anti-apoptotic, in the treatment and rehabilitation of COPD, has shown positive results in our studies. The study studied the effects of hydrogen water and hydrogen inhalation on chronic obstructive pulmonary disease. Clinical studies were conducted with patients. The patients participating in the study suffered from COPD and were divided into two groups: one drank hydrogen water, and the other inhaled hydrogen gas. During the study, the patients' respiratory function, oxygen consumption, inflammatory processes, and general condition were assessed. During the study, the patients underwent treatment for 2-4 weeks. Clinical results: As a result of drinking hydrogen water or inhaling hydrogen gas for 2 weeks, respiratory efficiency increased in patients, oxygen consumption increased significantly, shortness of breath decreased, and the general condition of the patients improved. Inflammatory indicators also decreased significantly. The effect of hydrogen water effectively improved respiratory processes and increased the physical activity of patients.

Conclusion: The article discusses the benefits of active hydrogen water and hydrogen inhalation and their use in the treatment of chronic obstructive pulmonary disease. The antioxidant, anti-apoptotic, cytoprotective and anti-inflammatory properties of hydrogen are gaining popularity as effective treatments for such diseases. The effect of hydrogen on the body, its significant role in neutralizing free

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radicals and strengthening immunity are shown. The effectiveness of hydrogen water and inhalation in clinical studies and their effect on physical activity are also analyzed. These methods are widely used in Japan and Korea, and their comprehensive beneficial effects a re being studied in medicine.

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