

A 100-year-old society with healthy longevity created by the power of hydrogen

Lifestyle-related disease prevention and anti-aging youth life

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「水素の力」 で創出する 健康長寿 100歳社会



生活習慣病予防と
抗老化で若生き人生



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INTRODUCTION

■As a pathology researcher

This book's purpose is to elucidate hydrogen that has received attention in medical settings and the anti-aging field from the standpoint of medical kinds of stuffs.

I am currently the president at the Akasaka AA clinic and had researched pathology.

Pathology is one of the basic medicines, and the study to research the causes and progress of illness and its effect on humans. It would reveal the mechanism of illness by examinations of cells and tissues with microscopes, and experiments.

I admired Noguchi Hideo, reading his biography as an elementary school student. He was a pathologist who studied cells.



When I was young, I was devoted to the study of pathology

In 1984, when becoming a professor in the Faculty of Pathology at Dokkyo University, I researched hepatic disease. Early proper treatment could cure it such as acute renal failure, however, it is difficult to cure chronic diseases such as chronic glomerulonephritis (慢性糸球体腎炎)、Chronic hepatitis (慢性肝炎)、Chronic pancreatitis (慢性胰炎) (disease names).

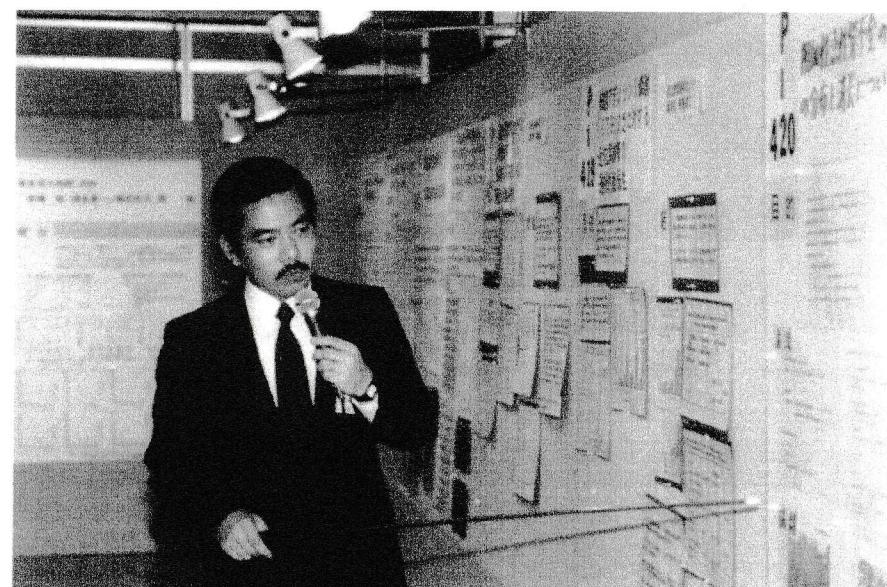
Why is it not possible to cure them? Modern medicine had almost no answer to it.

Even now, some doctors give advice about “how to live with illness” to patients with chronic disease. It is certainly important to cure contagious and acute disease, although treatment for chronic disease that affects patients’ lives is on a pivotal mission for medical care, and why it cannot overcome chronic disease; those thoughts always had stuck in my head.

■The Encounter with Active Enzyme

At that time, “active enzymes” had drawn attention in the medical world. Coronary arteries being clogged caused by coronary infarction, hearts would suffer from ischemia they get into lack of blood supply. The parts of the cardiac muscle with no blood supply die out due to lack of oxygen. Therefore, a new method of treatment has been established; Inserting a catheter into a blood clot gets blood flow again. There have been more cases that this treatment deteriorates symptoms and eventually takes away patients’ lives. Doctors researched and defined it as “(Ischemia repercussions disorder) 虚血再灌流障害”.

When the organs that once fell into ischemia and lost oxygen suddenly gain oxygen, the active enzymes would increase instantly. Cells with being in the state of ischemia will not die, although increasing active enzyme destroys and leads cells to death. The new treatment generates an active enzyme and then kills cells.



Professor at Dokkyo Medical University

When I was studying kidney disease, I thought that the active oxygen in the kidney might be damaged, so I started an experiment to visualize the active oxygen. It uses a mechanism that dissolves lead in a liquid and precipitates lead when active oxygen is generated. We can see the precipitated substance under a microscope, and we can estimate the amount of active oxygen from the amount of precipitation. We have published a paper summarizing the experiments.

In addition, we explained the mechanism of renal reperfusion injury by conducting animal experiments. We have proved that active oxygen causes significant damage not only to the heart but also to the kidneys, the entire human body.

- To the path of preventive medicine

A pathologist is a bridge between basic medicine and clinical practice.

The work of a pathologist is diverse. Did you take a portion of the lesioned tissue and look under a microscope to determine what was happening, or did you recheck the surgically rejected tissue to make the correct diagnosis? Also check if it exists.

This task, called pathological diagnosis, is performed in real time during surgery to help determine subsequent treatment strategies. The major change I felt as a pathologist was the increase in cancer patients. I have pathologically diagnosed cancer in about 100,000 patients.

Medical care is advancing, and someone should develop medicines and technologies. However, the number of cancer patients is increasing rather than decreasing.

Clinicians are desperate to cure the cancer patient in front of them. As treatment options and drug options increase, we combine them to provide the best viable treatment for our patients. But as a pathologist, I wonder why cancer is so increasing.

Actually, It is very difficult to cure cancer. If so, cancer prevention is needed. I am in the age of preventive medicine! I was keenly aware.

- Medical care in the anti-aging field

When he reached retirement age, he became an emeritus professor and was ready to begin research in preventive medicine.

We have collected a lot of information from the desire to learn preventive medicine, especially cancer prevention. However, the Internet was not as widespread as it is now. Information gathering is difficult.

I learned about the latest medical information in the United States. This is an approach to aging care called anti-aging. Anti-aging literally means "anti-aging" (that is, rejuvenation), but it also means "a healthy and youthful appearance that repels the phenomena and symptoms caused by aging."

I felt something close to the preventive medicine I had imagined, so I went on a tour to the United States.

Certainly, aging care is attracting attention, and when attending academic conferences, he actively talks about active oxygen. The American Academy of Anti-Aging Medicine (A4M) proposes that "aging is a disease" is not an extreme argument, and doctors believe that preventing aging is preventive medicine.

- Preventive medical care at the clinic

The results of the tests in the United States encouraged me and opened a clinic. Of course, it is an advanced clinic that practices preventive medicine. I knew that "reactive oxygen species" measures were essential to my goal of cancer prevention and preventive medicine.

Reactive oxygen damages genes and makes cells cancerous. This is the mechanism that causes cancer. And if you eliminate active oxygen, you should be able to prevent cancer. Around that time, foods that could be used as measures against active oxygen attracted attention. When I picked up ingredients containing ingredients that are said to remove active oxygen, such as vitamin C, polyphenols, and catechin, on a TV program, they were sold out one after another. People have been interested in foods that are good for their health.

However, food cannot be used for treatment. We measured the amount of active oxygen and antioxidant power, and advised patients with weak antioxidant power on diet and lifestyle, but it was not a breakthrough treatment method.

Is there anything that can get closer to the reactive oxygen species that cause aging and illness ... I kept looking.

- Encounter with "hydrogen"

At that time, I came across "hydrogen".

The first person to pay attention to the potential of hydrogen was Dr. Patrick Flanagan of the United States. A physicist and doctor, he has been interested in various phenomena since he was a child and was a genius at solving mysteries. He has invented and patented a variety of inventions, including the "guided missile detector" on which the Patriot missile was based and the "neurophone" hearing aid for people who are completely deaf.

Eventually, Dr. Flanagan, who had a strong desire to protect human life, met "Hunza Water".

A highland called Hunza in Pakistan. I knew that many of the people who lived there lived well over the age of 100 without major illness. Dr. Flanagan spent 30 years exploring remote areas known for longevity, including Hunza. He was only in areas with completely different lifestyles and eating habits, but all he had in common was "drinking water." The water they drink was also famous as healing water in the surrounding area.

When he studied the properties of this water, he discovered it was very high in hydrogen.

"Hydrogen" is the smallest element on earth and is an essential element for all living things.

Dr. Flanagan defined hydrogen as the antioxidant capable of counteracting reactive oxygen species and developed his own hydrogen supplement.

- Preventive medicine made possible by hydrogen

At that time, I got a hydrogen supplement and experimented and tested it in a university lab. Secondly, when hydrogen is administered, only active oxygen is removed, and only the worst hydroxyl radicals are removed (no beneficial effect on active oxygen can be confirmed).

I thought, "Hydrogen's antioxidant power must have a positive effect on treatment!" I incorporated hydrogen therapy into the treatment of the clinic. After that, the "Hydrogen / Medical Research Group" was established with the aim of medically researching

hydrogen and using it in the medical field, comprising doctors and researchers in each field. We carry out research activities such as reporting each research and clinical data.

In 2007 (Heisei 19), Professor Shigeo Ota (at that time) of Nippon Medical School and others conducted an animal experiment called "treating cerebral infarction with hydrogen". Similar to my experimental results, this paper published that hydrogen selectively removes hydroxyl radicals, reducing stroke and reducing the risk of sequelae. They also featured it in the famous British magazine *Nature Medicine*.

In 2016, the Ministry of Health, Labor and Welfare approved the treatment of the sequelae of brain injury because of cardiac arrest by "hydrogen gas inhalation" as advanced medical treatment.

With this as an opportunity, research on hydrogen will continue to progress, and I expect that we can use it in clinical practice.

I wrote this book because I wanted as many people as possible to understand the power of hydrogen and its potential.

How wonderful it would be if we could create a healthy and long-lived society with a 100-year history with the power of hydrogen. We hope this book will help you maintain your health and youth.

Doctor of Medicine Yoshiomi Mori

Chapter 1

Why do people get old and
get sick?



1 Lifestyle-related diseases are increasing because of super-aging.

In 2017 (Heisei 29), it was reported in the news that the average life expectancy of Japanese people reached a record high. Females are 87.14 years old and males are 80/98 years old. For the fourth consecutive year for women and for the fifth consecutive year for men, both men and women were ranked second after Hong Kong in international comparisons (Ministry of Health, Labor and Welfare 2016 Simple Life Table).

On the street, how do you live in the future ultra-longevity era as a "100-year-old era" instead of your 80s? Then, discussions began on the national and the social systems that were commensurate with it.

A Japanese who is turning 100 years old in his life. What serves that purpose?

Let's look at the cause of death of the Japanese. Cancer is the leading cause of death in both men and women. One of the major problems facing Japanese medical care is the increase in cancer. Both cancer mortality and morbidity have increased since 1985. In 2012, it will be about 2.5 times that of 1985 (estimation of national cancer incidence data registered by the National Cancer Center). The prevalence of cancer is declining in developed countries, but is increasing only in Japan.

You may have heard the phrase "one in two people get cancer". In the Meiji era, 1 in 100 people had cancer. When I was a medical student, I was one in four, so when I think about it, I felt, I am becoming more serious.

The preventive study group in the national Cancer center reported the cause of cancer, stating that "the majority of cancer is a lifestyle disease caused by preventable daily habits and environmental factors, and cancer risk is going upon as we get older."

Cancer is defined as a lifestyle disease.

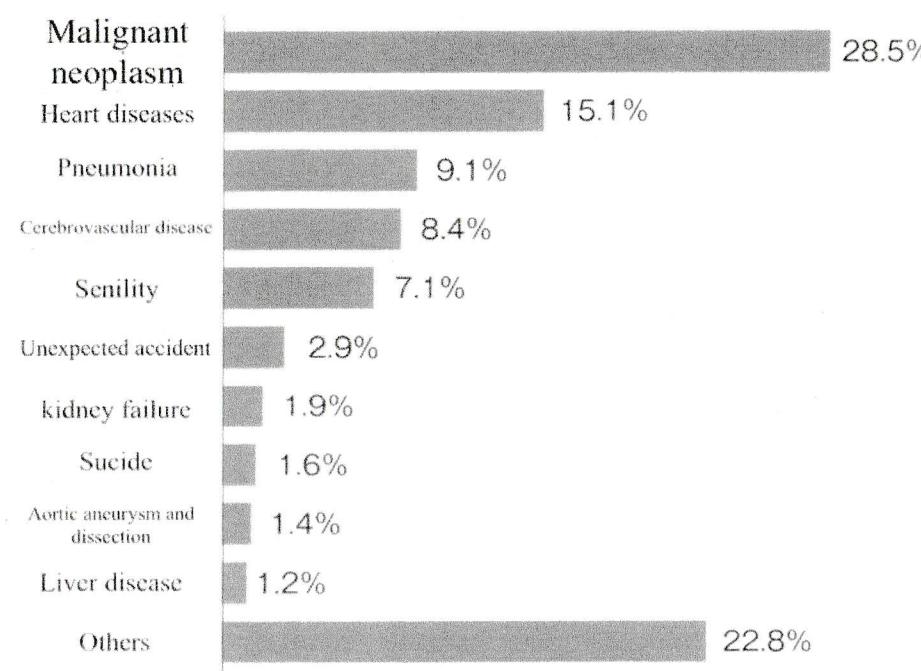
The highest causes of death followed by cancer are heart failure (15 percent), pneumonia (9 percent), and cerebrovascular disease (8.4 percent).

Heart failure such as angina and myocardial infarction and cerebrovascular diseases like cerebral infarction and cerebral hemorrhage is considered as the result of aging and daily habit.

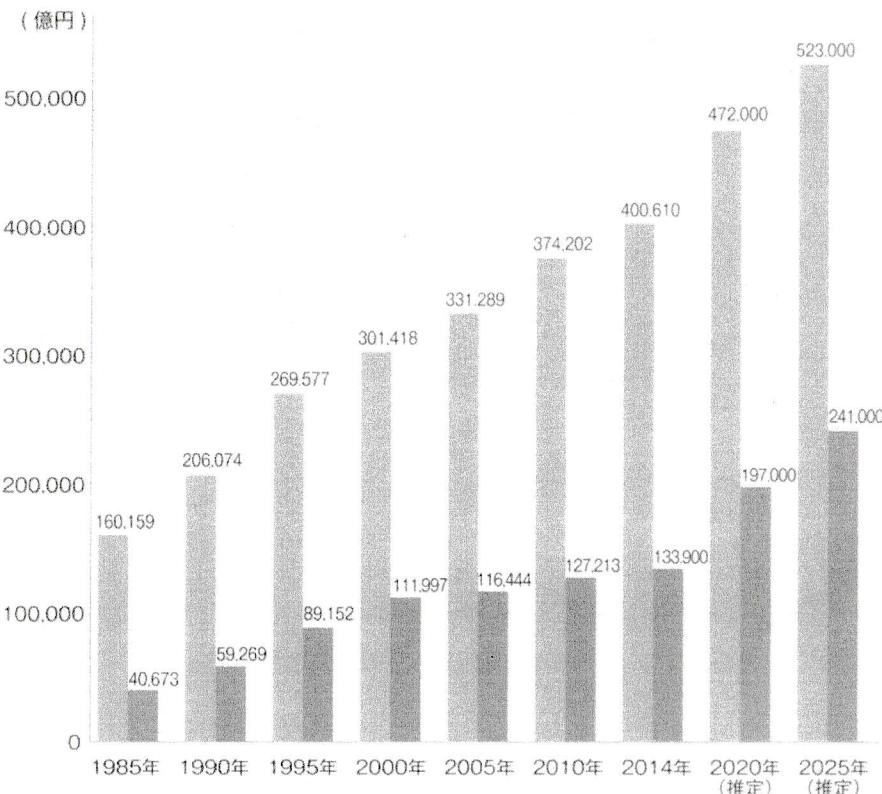
Nearly sixty percent of people have died from lifestyle diseases.

Even if not ending in death, many elderly people have contracted lifestyle diseases such as hypertension, diabetes, and hyperlipidemia. Regarding diabetes, the number of people strongly suspected of it including pre-diabetes reaches about ten million (Ministry of Health, national health, and nutrition research in 2016).

Cause of death ratio(total)



Reference source: Ministry of Health, Labor and Welfare from 2016 vital statistics



Reference source: Ministry of Health, Labor and Welfare 2015 National Medical Expenses Overview, National Medical Expenses Outlook

They are on the increase, as a result, they regard diabetes as a national affliction. If we can take the responses to cancer, heart and brain disease, and other lifestyle diseases, it would transform the health and lifestyle of the Japanese. The rise in lifestyle disease is not only a matter of individual lifespan and health, moreover, but it also affects the Japanese economy significantly.

The total medical expenses disbursed to medical settings in 2015 was 43 trillion 364.4 billion yen. Medical expenses per person was 333.3 thousand yen, which was 12.2 thousand yen higher than the preceding year. It had hit a peak for the past 9 years in a row. We can also see the effect of aging here: national medical expenditures per person over sixty-five years old was 184.9 thousand yen that over seventy-five years old was 929 thousand yen. The difference between them is almost five times (Ministry of Health, the Overview of National Medical Expenses in 2015 平成27年度国民医療費の概況).

The financial resource of medical expenses consists of insurance fees borne by companies and individuals (49 percent), public funds combined central and local governments (39 percent), and copayment of patients (11 percent).

The Ministry of Health forecasts that Japanese medical expenses would exceed fifty-two trillion yen by 2025. Corresponding to this, care expenditure will also climb. I have some concern about whether the present young generation can bear this burden.

Thus far, we have focused on lifestyle diseases in terms of the cause of death. In real life, however, few suddenly face the end. Rather, the majority dies a natural life after relying on care from others over many years.

Have you heard of the word, “healthy life expectancy?” It is the notion proposed by WHO in 2000, more precisely, “it measures the number of remaining years that a person of a certain age is expected to live without disability.”

To sum up, Average Life Span – Healthy Life Expectancy = Period with Disability. That is a huge risk of living a long life.

Calculating from the data in 2016, male healthy life expectancy is 72.14 years, as against the female one is 74.79 years (Ministry of Health Abridged Life Table in 2016). “Period with a disability” that subtracts healthy life expectancy from the average life span introduced at the beginning of this chapter is 8.84 years for men and 12.35 years for women.

How do you think of this period? Care-receivers bedridden in need of help from others, or caregivers continuing to care for the sick. Neither of them could consider around 10 years as a short time.

Both those who receive care and, not to mention, those who provide care cannot be happy if we put them in the situation where they cannot be independent and live without help.

Japan, one of the most world-renowned countries, is one with long living people.

There is the reality of which we cannot be really proud in the background, which is that Japan is "the country with long living unhealthy people", with NNK who is bedridden for nearly 10 years being the vast majority and PPK who die an active life being few instead.

Even if we achieved a great successful career and spent a life full of family affection and friendship, we could not call such an ending as a happy life. Therefore, in order for as many people as possible to complete their lives with the memory of a happy late middle age, I strongly recommend preparing for the latter end. Furthermore, I will devote myself to stemming the increase in lifestyle disease to solve the national and medical financial problems.

Conversely, if every single one of us could live healthily until the last moment, it could reduce medical expenditures and, as a result, relieve the pressure on the national finance.

In response to this background, the Ministry of Health has launched "21世紀における国民健康づくり運動－健康日本21" "The campaign for national fitness in the 21 century, Health Japan 21" since 2000, whose goals are to decrease illness and death of the late middle age, extend healthy life expectancy and improve QOL, Quality of Life.

Preventive medicine is the key to them. If we could prevent lifestyle disease and extend healthy life expectancy, the lifestyle of the elderly would transform. With the number of vigorous and youthful old people going up, medical expenses would decline, which leads to improving the national fiscal problem, eventually.

2. The cause of various illness: "aging"

Why do people have to undergo "the four sufferings: birth, aging, illness and death"?

Prince Siddhartha from the Shakya family had held a large doubt about the idea of "the four suffering" and so became a priest and eventually called Buddha. It was the doubt of "the four suffering", our unavoidable fate that triggered the birth of Buddha, who had affected the next generation's thought and philosophy considerably.

We living in the twenty-first century also live while holding the same doubts as Buddha had before entering the priesthood.

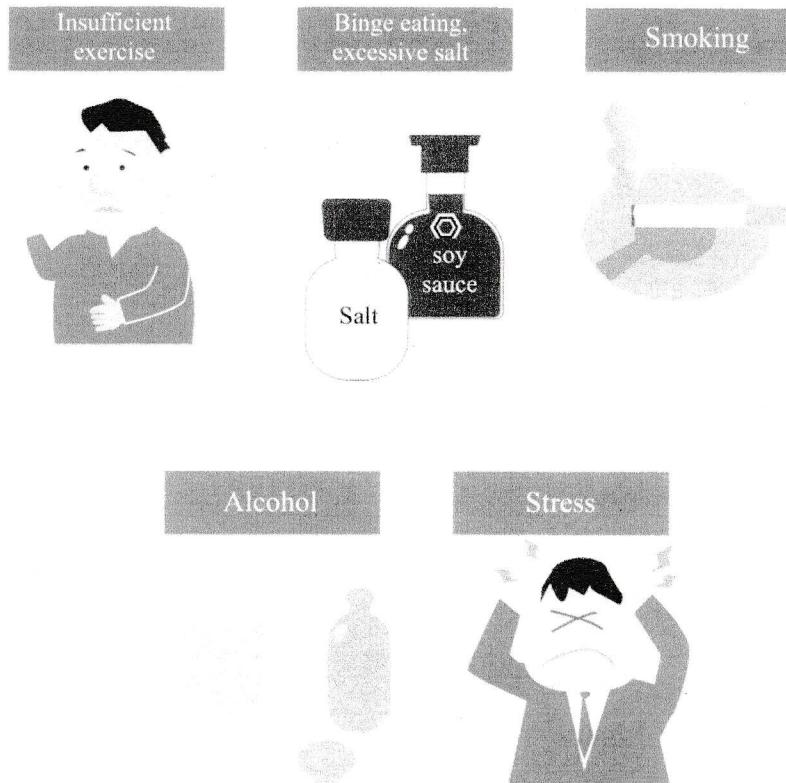
Human life is, thinking at a cellular level, merely a physical phenomenon of energy generated by the electron transfer activity of cells with amino acids, DNA, and mitochondria playing a central role. However, it could also be the stirring phenomenon that desperately keeps burning the flames of living organisms even while suffering from illness.

Why do people fall ill? Although medical and life science have not totally unraveled this question yet, diseases that affect human beings can be classified into some groups.

1. Disease by bacteria or viruses
2. Disease by external injury and functional deterioration: degeneration of physiological function and aging
3. Disease by stress
4. Disease by lifestyle
5. Disease by unknown etiology

Some disease has been overcome by medical care; however, some still remain unsolved.

The most common cause of death among them would be the fourth one above, disease by lifestyle. It holds a responsibility for diseases including cancer, heart disease, stroke, hypertension, diabetes, arteriosclerosis, obesity. Depending on the extent of daily bad habits, these diseases aggravate, confine us to beds and, in the worst case, lead us to death. If one cause of lifestyle disease, it is active oxygen in our bodies.



We cannot live without oxygen. Excessive oxygen, however, could occasionally deprive us of our health.

Mitochondria in cells produces our energy by causing the reaction of nutrients in food and oxygen, and generates active oxygen at the same time.

Active oxygen takes a crucial role to protect our bodies from bacteria and viruses. For instance, in the case of cells' being worn out or dead, they resolve and discharge these cells. But unfortunately, one to two per cent of oxygens inhaled by respiration transforms to abnormal by-products, which is what we call bad active oxygen.

Our bodies generate and consume active oxygen every single day. As will be described later, the human body has the function to curb or halt the excessive generation of active oxygen. Nevertheless, in recent years, our bodies produce active oxygen so excessively that this function cannot deal with it.

Under what circumstances is active oxygen generated?

1. When food turns into energy

Mitochondria generate energy by extracting electrons from glucose and fat and providing oxygen to them, and consequently, also produce active oxygen as a by-product.

2. When stress built up

When we are stressed out, cortisol, an adrenal hormone, is secreted and then, during the synthesis, active oxygen is produced.

3. When food additives enter the body

When food additives such as preservatives and preservatives enter the human body, detoxifying enzymes decompose the additives mainly in the liver, whose action produces active oxygen.

4. When exposed to ultraviolet rays

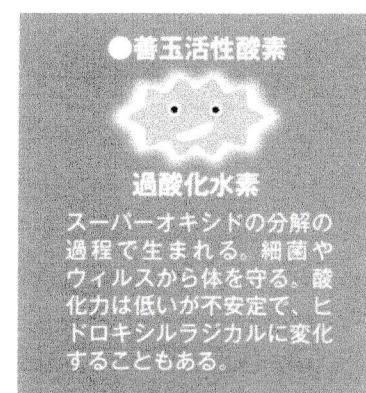
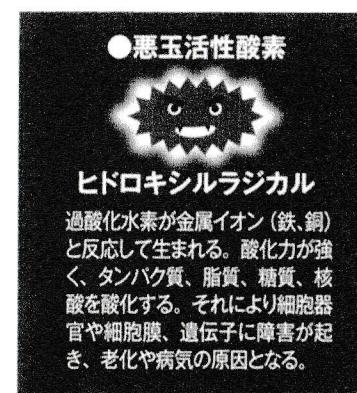
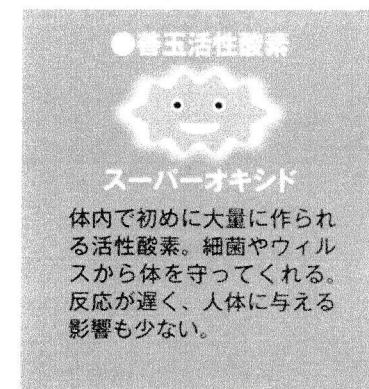
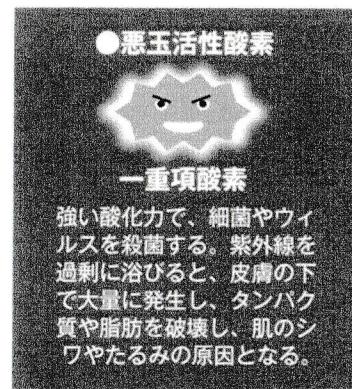
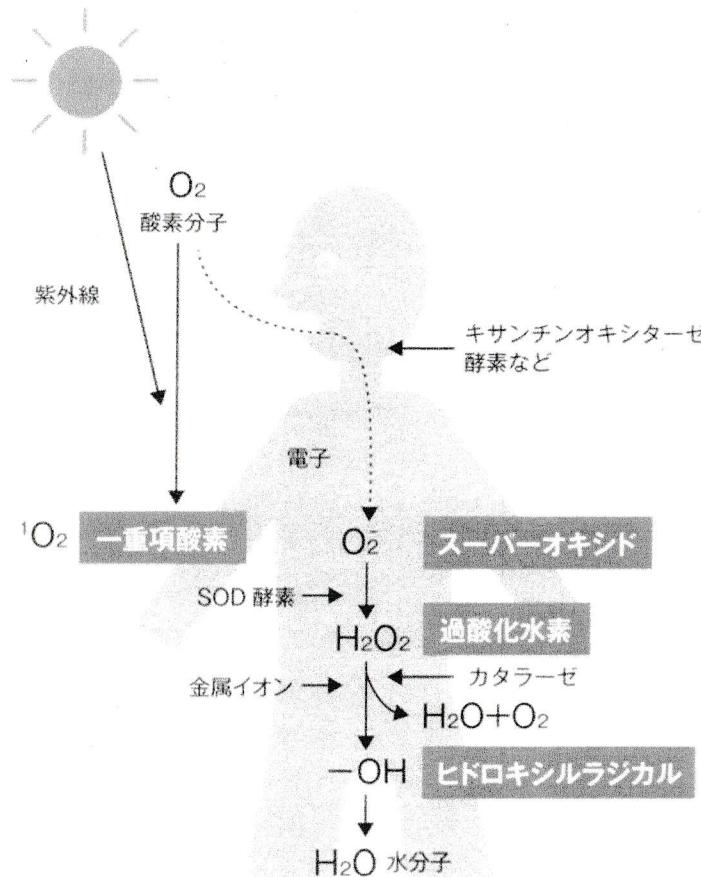
Reacting with water molecules in the skin, ultraviolet rays generate active oxygen.

5. Other factors

External factors such as air and water pollution, chemicals such as agricultural chemicals and insecticides, and electrical appliances that emit electromagnetic waves. Daily habits such as intense sports, overwork, lack of sleep, smoking, and excessive drinking.

Modern people lead lives that are predisposed to produce active oxygen in an environment where active oxygen is easily generated. It is the reason our bodies possess excessive active oxygen.

活性酸素が発生するプロセス



The human body is composed of many cells, presumably 60 trillion or 40 trillion. These cells are covered with cell membranes whose principal component is phospholipids, and take in and discharge substances through the membrane. They produce active oxygen in this process.

Active oxygen stabilizes by wresting electrons out of others, and cells lost electrons undergo "oxidation". Phospholipids, the principal components of cell membranes, are exceptionally easily oxidized substances and become "lipid peroxides" reacting with active oxygen. Excessive lipid peroxides induce cell membranes to get rusty, worn out, punctured, and end up unable to protect cells.

When the mitochondrial membrane is pierced by active oxygen, the cells teem with active oxygen. As a result, the cell function declines, and the aging of cells and the entire body progresses. Oxidation of the nuclear membrane also damages genes.

There are mainly four types of active oxygen, good and bad ones.

In creating energy, if some external stimulus (bacteria, virus, etc.) Invades the body, an enormous amount of good active oxygen, "superoxide", is generated. After that, during oxygen decomposing superoxide, good active oxygen "hydrogen peroxide" is created.

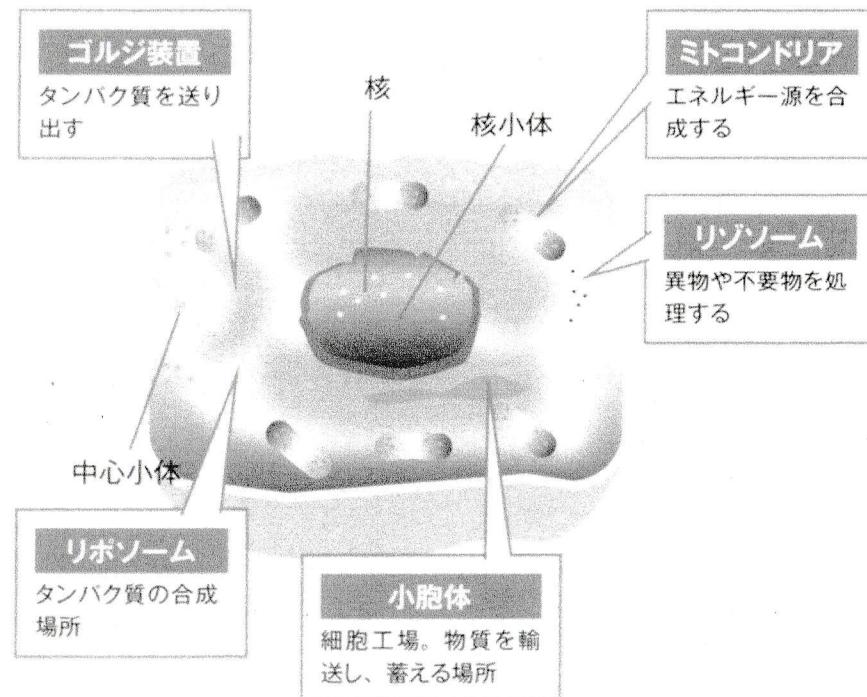
When ultraviolet rays react with oxygen in the air, bad active oxygen, "singlet oxygen", is produced. The reaction of hydrogen peroxide with metal ions (iron and copper) forms a "hydroxyl radical", which is the most powerful bad active oxygen.

Various problems caused by mitochondrial aging

Energy is essential for us to breathe, move, and think. The organ that makes the energy is mitochondria.

It is the micro energy production factory that generates the energetic material called ATP (adenosine triphosphate) from nutrients in diet and oxygen.

The human body comprises presumptively either 60 trillion or 40 trillion cells, and each cell contains 300 to 1000 mitochondria. There is another theory that adults possess approximately 10,000 trillion mitochondria.



When mitochondria generate energy, they form about 1 to 2 percent of active oxygen from oxygen ingested through respiration. The amount of the formation reaches nearly 40 ml per minute, which is said that they produce almost the same amount as a body weight in a day.

In other words, mitochondria produce energy that is indispensable for humans, as well as active oxygen (hydroxyl radicals) that induces diseases.

Since mitochondria that create energy also contain the antioxidant enzyme called SOD (superoxide dismutase), they can eliminate active oxygen.

However, as we get older, mitochondria get exhausted, which leads to the decline in the amount of SOD formation. The active oxygen that mitochondria could not process oxidizes the membrane of the mitochondria. Active oxygen that punctured mitochondria also damages DNA in the cell nucleus. As a result, we fall ill.

If comparing cells to cars, the active oxygen emitted from the mitochondria that function as the engine, is something similar to black smoke caused by incomplete combustion. The running car, with the dirty engine on and black smoke spewed out. It is what we call the state of "aging."

* The number of mitochondria differs depending on organs

4. Protect the body from active oxygen

Active oxygen causes aging and oxidation. If active oxygen is removed from our body, we could maintain a youthful body without getting rusty. Therefore, it is important to understand the cause of the active oxygen formation and take measures against oxidative stress in daily life.

An excellent example here is avoiding stress, food additives and UV rays as much as possible. In addition, it is also crucial to quit smoking, reduce alcohol consumption, and get enough outstanding quality sleep. The improvement of lifestyle would prevent active oxygen from being produced.

Antioxidants can eliminate active oxygen generated by mitochondrial activity.

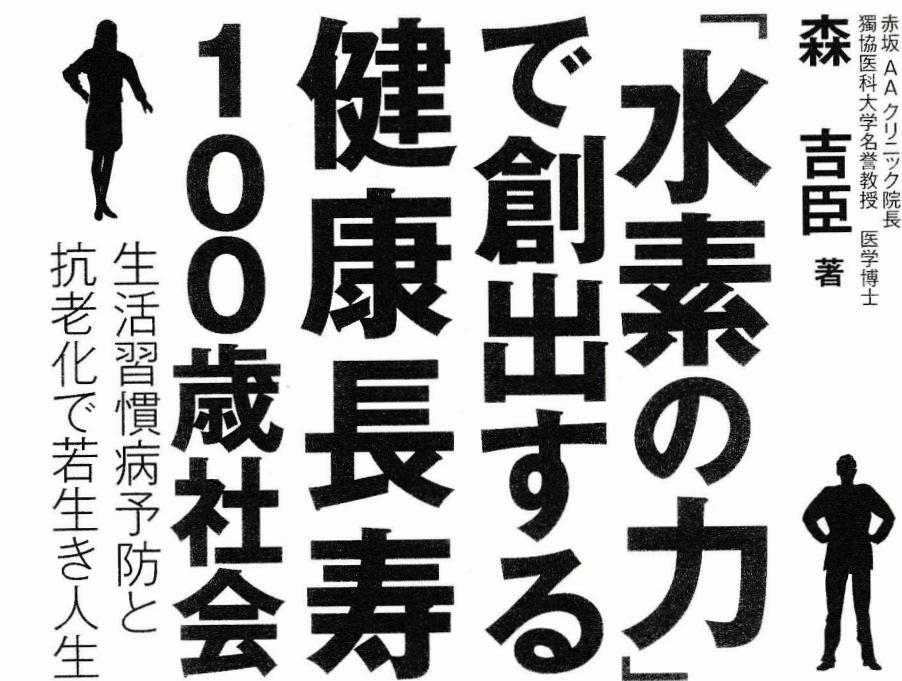
There are mainly two types of antioxidants: "antioxidant components" (vitamins, minerals, polyphenols, etc.) Contained in food and "antioxidant enzymes" produced in the body. Substance that renders active oxygen harmless is called a "scavenger". Each of them works on the specific active oxygen.

Despite "antioxidant components" and "antioxidant enzymes" can eliminate active oxygen, they cannot work on strong bad active oxygen and hydroxyl radicals in the same way as they do on others. Hydrogen is the one that can remove the hydroxyl radical.

活性酸素種	スカベンジャー
一重項酸素 (植物系ビタミン)	βカロテン、ビタミンE
スーパーオキシド (体内酵素)	SOD (スーパーオキシドディスクターゼ)
過酸化水素 (体内酵素)	カタラーゼ、グルタチオンペルオキシダーゼ
ヒドロキシルラジカル (気体)	水素

Chapter 2

The power of "hydrogen" to
combat "aging"



生活習慣病予防と
抗老化で若生き人生

1 What is hydrogen?

"The earth is a planet of water". "60% of the human body is made of water". Water is an indispensable substance for us.

Some people argue that about 13.8 billion years ago, a mass of ultra-high temperature gigantic explosion (big bang) and in the event, the universe was created. Innumerable fine particles that the big bang brought forth, repeating complex reactions, created various elements, when "hydrogen" was first born.

Hydrogen accounts for approximately 90% of elements existing in the universe. The sun is a massive sphere composed of hydrogen.

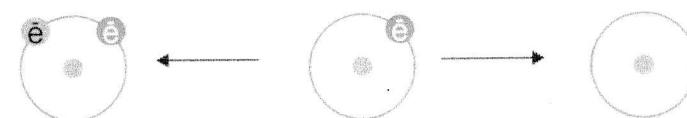
Four billion years ago, the first creatures came into existence on Earth. These photo bionts survived in the environment without oxygen. One billion years later, (cyanobacteria) then emerged from them.

Harnessing the light energy of the sun, photosynthetic organisms generated glucose from carbon dioxide. Plants that had landed 500 million years ago used only hydrogen from underground water to yield organic substances in fruits (carbohydrates, fats, proteins), and subsequently released unnecessary oxygen.

Animals use the oxygen in order to breathe, and ingest organic substances produced by plants to generate energy in the body. In other words, the source of life on earth is water, and so we construct the ecosystem through water even today.

Water is the one combining two hydrogen atoms and one oxygen atom. Hydrogen being atomic number 1, it has the simplest structure and is the lightest and smallest in all elements. Its fastest diffusion power attributes the characteristic of giving various electrical effects to other substances.

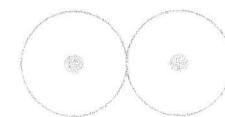
水素原子は超軽量で、安定しない



●マイナス水素イオン
2個の電子同士が反発するため、酸化された物質に電子を与えやすい。

●水素原子
電子1個を持っている。

●水素イオン
電子1個を失い、陽イオン溶液の水素イオン濃度を決める。(軌道に電子がない水素)



■水素分子は水素原子が2個結合したもの

2 Hydrogen as an antioxidant

Since hydrogen is the smallest and lightest substance, when taken into the body, it penetrates into every corner. The feature to enable entering cells and mitochondria makes it possible to work on bad active oxygen. After the reaction, it turns into water and then is discharged from the body.

Human brain tissue is a special entity that differs from other organs. The blood entering the brain has a barrier called the "blood-brain barrier," whose structure prevents unnecessary substances such as toxic materials from invading the brain. Not only amino acids, but also most medicaments cannot pass through there. There are two substances that can go through the "blood-brain barrier": glucose, the energy of the brain, and hydrogen, the smallest substance on the earth.

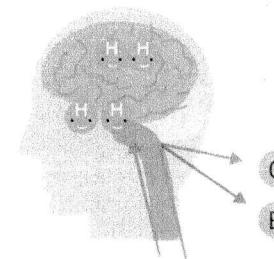
In addition, antioxidants may not enter ova that affect offspring. On the other hand, hydrogen can also go into them.

Hydrogen's antioxidant power is weaker than antioxidant components (vitamins C and E, etc.), and so does not work on good active oxygen, which leads to act on and remove only bad active oxygen and hydroxyl radicals.

Hydrogen is soluble in both the cytoplasm (water-soluble) and the cell membrane (fat-soluble). Being small and responsive, it can penetrate anywhere in the body. When detecting the cells that bad active oxygen oxidized and then lost its original balance, hydrogen immediately acts on them.

血液脳関門を通過できる水素は
体のどこへでも
入ることができる

脳組織には、有害な物質や分子量が大きい物質を脳内に侵入するのを防ぐしくみ（血液脳関門）がある。ビタミン（B6を除く）などの抗酸化物質は脳内に入れない。



3 Hydrogen can eliminate super bad active oxygen

Hydrogen is one substance that is enabled to eliminate bad active oxygen and hydroxyl radicals.

In 2007, the research group of Prof. Ikuro Osawa at Nippon Medical School announced that hydrogen selectively scavenges hydroxyl radicals in the prestigious British medical journal, "Nature Medicine".

In the journal, they reported that "hydrogen molecules could apply to the prevention and treatment of various diseases by selectively reducing highly malignant active oxygen in the body and lowering oxidative stress."

The treatise surprised researchers and medical professionals around the world and drew attention to "hydrogen" at once. Since then, over 400 papers on the bioactivity of hydrogen molecules have been published inside and outside the country.

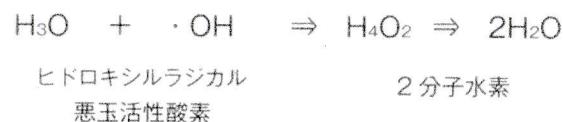
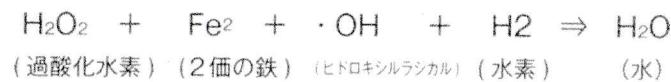
The fundamental characteristics of hydrogen in the medical field are:

1. Eliminating bad active oxygen (hydroxyl radical) that contributes to the cause of illness
2. Protecting and activating inactive mitochondria that is one factor of aging

The improvement of the blood circulation of the whole body increases the amount of oxygen supply. As a result, acknowledged the function as anti-inflammatory and analgesic effects, they also adopted it into medical practice.

大澤先生研究グループは、動物実験や臨床研究の結果に基づき、
「水素は選択的にヒドロキシラジカルによる
酸化ストレスを撃退する」
と「Nature Medicine」に報告。

Ikuro Osawa, Shigeo Ohata et al: Hydrogen acts
as a therapeutic antioxidant by selectively
reducing cytotoxic oxygen radical
Nature Medicine, 13, 688-694, 2007



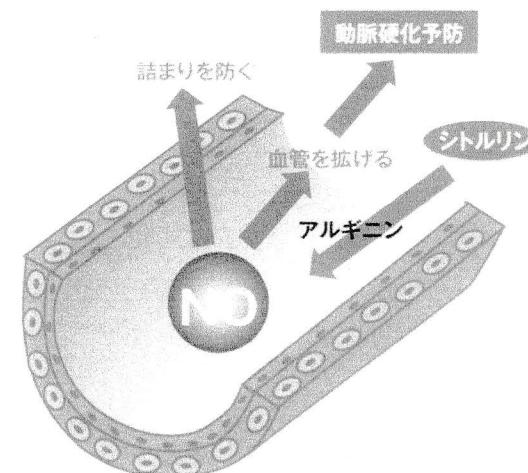
4 Hydrogen also increases nitric oxide

Our blood vessels have the function of expanding themselves. When blood circulation increases, the innermost endothelial cells in blood vessels produce and release a vasodilator, nitric oxide (NO). The nitric oxide acts to relax smooth muscle tension and widen blood vessels.

However, as the endothelial cells in blood vessels age, hydrogen reduces the productivity of nitric oxide. Since blood vessels are not widening enough, blood flow decreases, which is the beginning of what we call arteriosclerosis.

Administering hydrogen here enhances the production of nitric oxide and expands the blood vessels, and blood flow increases. Well, using hydrogen is expected to remedy anti-arteriosclerosis and brain function.

Each human blood vessel differs in its hardness and expansive force. Depending on the person's age, lifestyle, genetic conditions, and so on, some parts of them have poor bloodstreams and some are hard. In general, their states fairly vary. Although administering hydrogen with treatment such as intravenous drip is a self-funded medical treatment, it can selectively act on the bad part of blood vessels, rise the amount of nitric oxide, and increase the bloodstream. Blood is the indispensable body fluid that carries oxygen and nutrients throughout the body. It is a prerequisite for a healthy body that blood circulates the entire body without getting stagnated.



Chapter 3

Supporting maintenance of
beauty and health and
preventive measures
against illness

「水素の力」
で創出する
健康長寿
100歳社会



生活習慣病予防と
抗老化で若生き人生

赤坂AAクリニック院長
獨協医科大学名誉教授
医学博士
森 吉臣 著



Recover from fatigue

I often hear voices from those who have incorporated hydrogen into their daily lives saying that "I am less tired than before" and "workouts do not get me tired so easily". Is active oxygen related to fatigue?

I decided to measure the lactic acid level in order to verify the ability of hydrogen to recover from fatigue.

Lactic acid is the substance produced when glycogen and glucose are consumed by exercises. Lactic acid accumulates, the muscles become acidic and stiff and so we feel tired. Measuring the lactic acid level enables us to estimate the degree of fatigue.

We conducted a survey of the ability of hydrogen to recover from fatigue with ballroom dancers.

As a result, the athletes reported that "taking hydrogen before practice, how much I got tired is completely different (less tired)".

When we get tired and the oxygen in muscles is on the decrease, lactic acid that has not been transformed into energy remains. Therefore, the amount of lactic acid could be the indicator of fatigue. Ingesting hydrogen increases blood circulation, and in turn it can carry the accumulated lactic acid. Transported to the liver, lactic acid is transduced into energy, that is, fatigue substances could turn into energy.

In addition, considering the causes of fatigue, that active oxygen damages cells might be one of them. If ingestion of hydrogen activates mitochondria, bloodstream would increase and then carry oxygen and nutrients throughout the body, which could reduce fatigue and recover energy.

Maintain good health

Oriental medicine has the idea that there is a state of "pre-symptomatic disease" between health and illness. It is the word appeared in "黃帝內經 (Koteidaikei)", the oldest medical book compiled in the Western Han era in China. The meaning is that in spite of germination of illness in the body, there are no symptoms on the surface, however, if the condition continues, it will develop and turn into illness in the end.

If we could improve our physical constitution and prevent the occurrence of a disease at an early stage while still in the presymptomatic disease state, we might not fall ill.

Improving conditions of obesity, high blood pressure, and hyperglycemia belonging to presymptomatic diseases might prevent lifestyle diseases such as diabetes and its complications, myocardial infarction, stroke, and cancer.

Maintaining good health is attributed to how to control the presymptomatic disease state.

If a healthy body and mind bear a large burden such as aging, stress, fatigue, overwork and so on, they easily fall into the presymptomatic disease state.

Chronic fatigue, anorexia, gastrointestinal inactivity, dizziness, tiredness, headache, shoulder stiffness, poor circulation. They are described as subjective symptoms of presymptomatic disease.

Active oxygen is one cause of these symptoms detected in the presymptomatic disease state. When the rise in active oxygen renders mitochondria inactive, energy is not generated. When active oxygen increases, so does lipid peroxide at an excessive rate, which damages and turns cell membrane into the worn-out state with holes. Inside of this, the function of the cell deteriorates. As a result, various disorders occur at the pre-disease stage.

I assume that the hydrogen approach is effective for symptoms of presymptomatic disease caused by the activity of active oxygen.

Shoulder Stiffness and Back Pain

If staying in the same position for a long time or in a bad posture such as a stoop, muscles become tense, blood vessels contract, and blood circulation reduces, which would cause shoulders and lower backs to get stiff and sore.

Poor blood circulation stagnates oxygen and leads to hypoxia. In addition, it also renders mitochondria inactive and then energy is not produced any more. At the same time, lactic acid, a fatigue substance, accumulates.

If this condition continues, hypoxia develops active oxygen. It oxidizes and damages surrounding tissues, which induces inflammatory cells and causes inflammation. Therefore, shoulders and lower backs get tension and pain.

They expected that hydrogen would serve a removal function for bad active oxygen, a factor of inflammation. Dilation of blood vessels renders bloodstream flowing smoothly. By this, oxygen and nutrients circulate around throughout the body, and intracellular mitochondria become activated, which leads to extra energy. The accumulated lactic acid, we carry fatigue substance to the liver and also converted into energy. This process would relieve tension and pains in shoulders and lower backs.

The Body Gets Cold

In the present day, it is said that approximately 60% of women and 40% of men are conscious that "their bodies are cold".

Not to mention in winter, the number of people is on the rise in recent years who feel cold even in summer.

The reason lies in lifestyle. All year round, ingesting cold drinks and meals, and not ingredients that warm the body, it gets cold from the digestive organs. In addition, these factors: only taking a shower without soaking in a bath, lack of exercise, and loss of muscle mass due to crash diet, would lead to psychroesthesia.

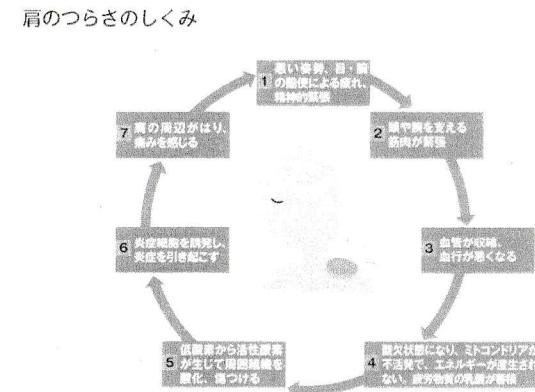
There are three main reasons the body gets cold.

1. Inability to produce heat in the body

Muscles take up 40 percent of the body's basal metabolism. Loss of muscle mass drops calorific value.

2. Not spreading heat throughout the entire body

When the balance of the autonomic nerves is disordered due to anxiety, stress, lifestyle, etc., it stagnates the bloodstream, and heat cannot reach the whole body.



3. Loss of heat in the body

Poor bloodstream and coldness of the body disturb sweating, and so the body accumulates unnecessary water and easily gets cold.

If the coldness of the body continues, we lose appetite and get tired easily, and likewise, often come into "sleepless state" or "distractedness".

As one saying goes, "coldness of the body leads to all kinds of disease."

If the body remains stiff, bloodstream would decrease and then cannot deliver oxygen and nutrients throughout the whole body, where it accumulates waste products without discharging them. It is said that as the body temperature drops by 1 degree Celsius, the immune strength decreases by 30 percent, so that the coldness of the body and the immune strength are inseparably related.

Without improving the coldness of the body, the risk of diseases will go up.

Ingestion of hydrogen by intravenous drip or suction can remove bad active oxygen. The stagnant bloodstream flows better, which possibly warms the unconscious body up.

Moreover, as the active oxygen in the blood diminishes, nitric oxide, a vasodilator, increases. Nitric oxide relieves the tension of smooth muscle and so blood vessels expand. Hydrogen itself also has the function to enhance the productivity of nitric oxide. Dilation of blood vessels in synergy with the function of hydrogen enables the delivery of blood to the entire body and then could improve the coldness of the body.

Effect on aging care

As getting old, inevitability, the body ages.

I assume this is what most people think. However, aging care medicine born in the USA in the 1990s breaks the mold.

The guiding principle of the American Academy of Anti-Aging Medicine (A4M) is "Aging is inevitable for anyone, but aging is an avoidable disease."

In addition, in 1997, Dr. Ward Dean in A4M announced that "aging is one disease". This has become the basis of the idea of aging care that as long as the cause is a disease, medical care can prevent and treat it. There are two types of aging: "physiological aging" and "morbid aging". Modern medical care cannot stop physiological aging belonging to a natural phenomenon. With regard to the latter, the pathogenic factors, the cause of various diseases, accelerate aging and eventually induce morbid aging. It is, however, possible to control morbid aging.

Likewise, we can classify the age into two types: "actual age": physical aging, and "functional age": biological aging that represents the state of mind and body.

Even at the same age, some people look younger, while others look older. As the aging factor increases, the functional age overtakes the actual age, which makes our appearance look older. Conversely, the removal of aging factors might retard the progression of aging. Isolating and removing the aging factor is the approach in aging care medicine that is widely adopted in the beauty field.

Women who desire to always stay young and beautiful are positively engaged in aging care to attain beauty and health. Therefore, the beauty field also incorporates hydrogen.

• **Mechanism for Getting Spots and Wrinkles**

Considering anti-aging beauty, the first thing that comes to mind would be beautiful skin. Many people yearn for fine-grained bare skin without spots or wrinkles.

Skin comprises, from the outside, a layer of stratum corneum, stratum granulosum, stratum spinosum, basal layer, dermis, and subcutaneous fat.

New cells are created in the basal layer. Old ones are being pushed up to the upper layers of the epidermis. When reaching the uppermost stratum corneum, they turn into scurf and peel off.

Although ultraviolet rays are indispensable for producing vitamin D, the excessive exposure puts stress on the skin. The stratum corneum reflects ultraviolet rays, the great enemy of skin, and absorbs them to prevent their invasion to the body.

Nevertheless, singlet active oxygen (one of bad active oxygen) produced by ultraviolet rays attacks skin cells. The melanin pigment in the skin countervails it. Strong ultraviolet rays convert tyrosine in the body into melanin pigments, and they subsequently try to protect the skin.

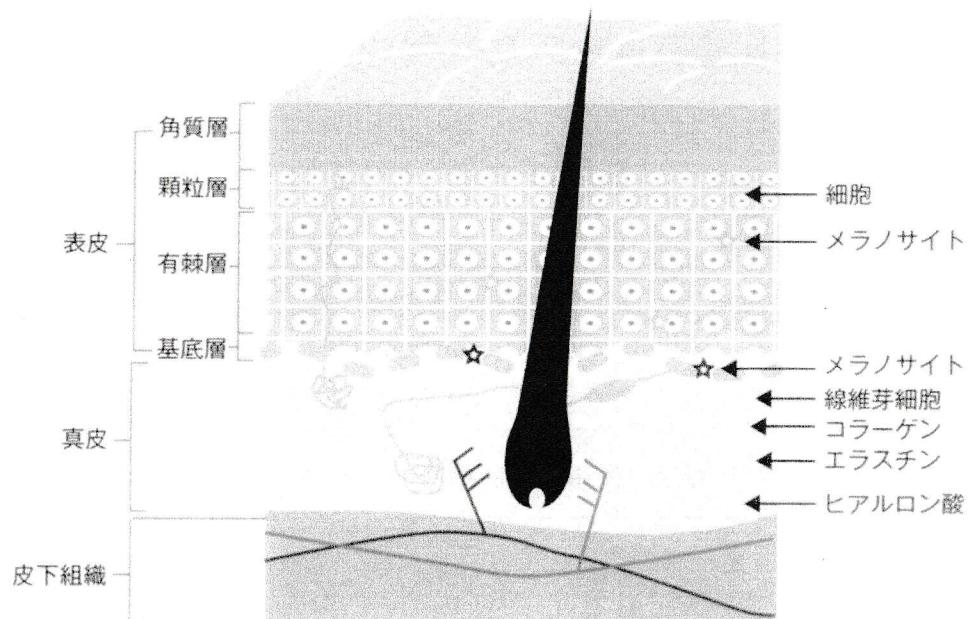
Metabolism acts on melanin pigment to discard them from the stratum corneum, but the remains in the body turn into a stain. In addition, when ultraviolet rays oxidize cell membranes of the skin, lipid peroxides increase, which leads to dullness, stains and sagging of the skin.

In the skin, a protein called collagen maintains the tension, and fibrous elastin keeps the elasticity. When the activity of active oxygen oxidizes them, their functions are impaired. Skin loses the tension and elasticity, and gets sags and wrinkles. 皮膚の構造

In order to produce proteins such as collagen, their raw materials, amino acids and vitamin C are indispensable. However, when active oxygen is on the rise, the body consumes vitamin C to remove it. The lack of raw materials ceases to produce collagen and elastin in the end.

Ingestion of hydrogen removes active oxygen. By this, we expected Vitamin C to promote the producing function of collagen and elastin. Furthermore, hydrogen activates intracellular mitochondria and so does the function of skin cells.

Hydrogen supposedly works on not only active oxygen but also pain and allergies. Recent studies have reported that the cause of thinning hair is also insufficient collagen production.



As mentioned above, if ingesting hydrogen eliminates active oxygen in cells of the scalp, and produces collagen from its raw material, vitamin C, which might lead to create the favorable conditions for scalp.

In the conventional idea of beauty, it was convinced that injecting antioxidants such as vitamin C, vitamin E, and coenzyme Q10 through the skin and scalp was effective to prevent aging.

Nevertheless, since all antioxidants have large molecules, they are unable to reach the inside of cells, especially mitochondria. Hydrogen, the smallest molecule, on the other hand, quickly reaches the intracellular and mitochondria. Removal of active oxygen and activation of mitochondria would accelerate the production of collagen and elastin, which might result in the maintenance of youthful skin and hair.

Prevention and treatment of illness

As mentioned in the "Introduction", research on hydrogen is advancing constantly and rapidly.

Many doctors pay attention to hydrogen, and besides, professors who have adopted hydrogen for their treatment reported various achievements.

As we have said, in 2007, Prof. Shigeo Ohta (Cell Biology) in Nippon Medical School and his research group announced the element had the effect of scavenging active oxygen (hydroxyl radical).

They conducted the experiment with the use of rats in which artificially developed cerebral infarction. We administered one's hydrogen gas at a concentration of 2%, while the other left with the blood circulating as usual. As a result, we confirmed that brain damage in rats given hydrogen gas was less than half that in one's given nothing.

Prof. Ohta commented that "hydrogen does not act on good active oxygen. It is more effective as it featured His research results in the US scientific journal, "Nature Medicine" as well as NHK. This led to many doctors and researchers taking notice of hydrogen.

In the present day, the standard treatment in clinical settings is surgical treatment to remove the source of the disease, or drug treatment to supplement the deficient substance. If the treatment showed an excellent result, it would eliminate the cause of the disease and ease the symptoms. The risk of recurrence, however, remains high, unless changing the underlying constitution that induced the disease.

Prevention and treatment with hydrogen approaches this fundamental matter.

Currently, doctors in various fields are working on them, including the combination with standard care.

High-Blood Pressure

As the saying goes, "a man is as old as his arteries", blood vessels age as we get older.

Oxidized lipids, especially LDL cholesterol as we say bad cholesterol, are deposited on the inner wall of blood vessels, and form vascular plaque. The lumen of blood vessels gradually narrows, resulting in poor blood flow. This is arteriosclerosis.

Since blood is forcibly being carried around the entire body through narrow blood vessels, the resistance of the blood vessel wall goes up and then blood pressure rises. As getting older, the blood vessel lumen becomes narrower. Therefore, it is a matter of course that blood pressure rises. Nevertheless, high-blood pressure caused by arteriosclerosis is identified as a risk factor for vascular diseases such as stroke, heart disease, kidney disease, and aortic aneurysm, and so we have encouraged the early prevention and treatment.

The standard care for high-blood pressure is "lifestyle remediation" (salt restriction, vegetable or fruit intake, cholesterol and saturated fatty acid restriction, moderate exercise, smoking cessation, alcohol restriction, maintaining proper weight) and taking antihypertensive drugs.

There are several types of antihypertensive drugs, which lower blood pressure with various approaches. For instance, reducing the influx of calcium ions into vascular smooth muscle to dilate blood vessels, suppressing the hormone action that plays a part in the rise of blood pressure, and so on.



The medical treatment with hydrogen adopts the approach that prevents oxidation of the inner wall of blood vessels.

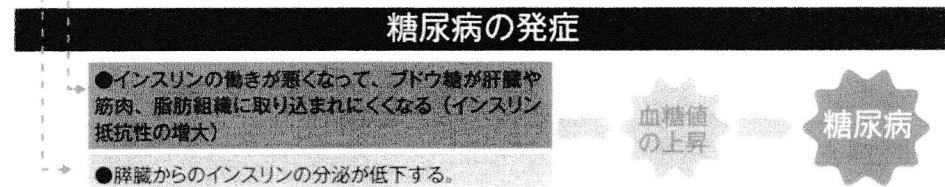
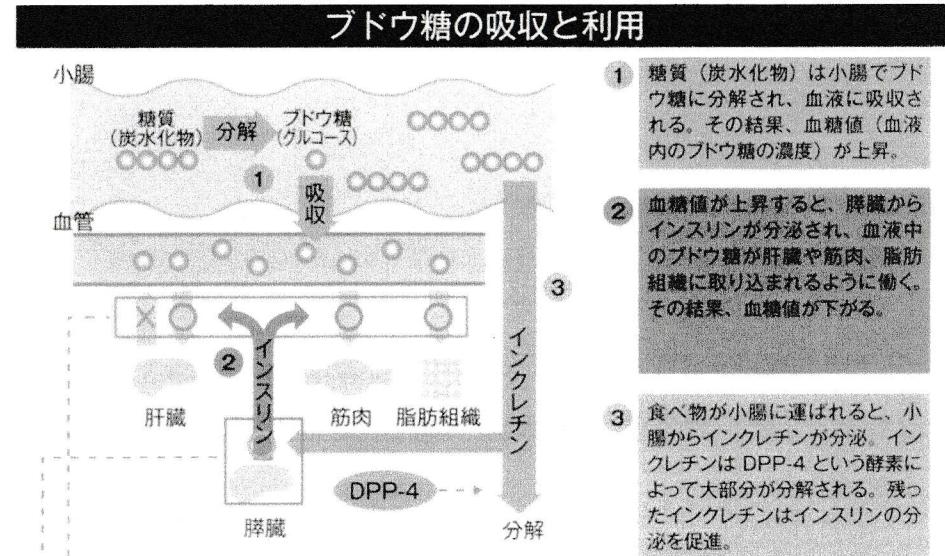
Bad active oxygen (hydroxyl radical) causes oxidation of plaque attached to the inner wall of blood vessels. If ingestion of hydrogen removes them, deposition of LDL cholesterol is preventable. Since hydrogen also increases nitric oxide, they expected that blood vessels expand and could control blood pressure.

Diabetes

Human energy is produced as follows; the hormone insulin that spleen emits intakes glucose (blood sugar) into cells and delivers to each organ and tissue, when energy is yielded. Insulin not fully functioning, glucose in the blood increases. This is diabetes. The cause is presumably insufficient insulin secretion because of the decrease in spleen function, or the ineffectiveness of insulin.

There are many patients who cannot recognize symptoms of diabetes since they have no pain with their blood sugar level being just high. However, if hyperglycemia continues, it would damage blood vessels, which leads to a risk of diabetic complications (heart disease, renal failure, blindness, necrosis of the legs).

The same methods as high-blood pressure conduct diabetes treatment: "lifestyle remediation" (diet therapy, exercise therapy) and drug therapy. Drugs include ones to improve insulin secretion and efficacy, to delay the decomposition and absorption of sugar, oral medicine to promote the



excretion of sugar, and in addition, injections to supplement insulin itself from the outside of the body.

It might cause diabetes because active oxygen affects β -cells in islets of Langerhans in the pancreas and reduces the insulin secretion. There was a case in which ingestion of hydrogen via intravenous drip removed active oxygen, and then β -cells being protected, they restored the ability to synthesize and secrete insulin.

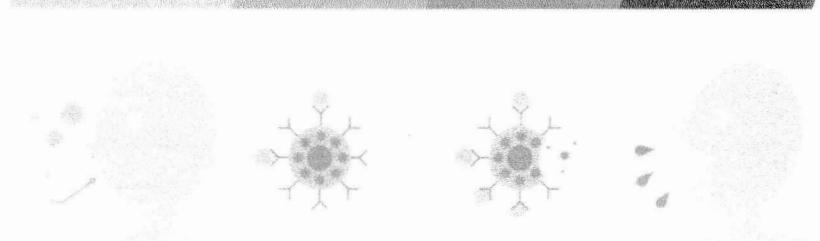
Moreover, it is basically considered that diabetic complications are caused by the activity of active oxygen to damage each cell. Ingestion of hydrogen holds promise to prevent or improve the symptoms.

Allergic diseases

In Japan, one in two people supposedly has some kind of allergic disease (2011 Rheumatoid Arthritis and Allergy Countermeasures Committee Report). It would be no exaggeration to say that it is one of modern diseases.

Our body possesses "immunity" in order to repel foreign substances (antigens) such as bacteria and viruses that have invaded from the outside. When an antigen enters the body, it produces the substances and antibodies to counter the antigen and eliminates it.

アレルギーのしくみ



①花粉やハウスダストなどのアレルゲン(抗原)が鼻粘膜に付着

②アレルゲンが肥満細胞の抗体に接着する

③再度アレルゲンが侵入すると、ヒスタミンなどのアレルギー誘発物質を放出

④鼻水、鼻づまり、くしゃみなどのアレルギー反応を起こす

However, when the immune function overworks, it responds to the invasion of antigens (food and pollen) that should be harmless to the human body, which is an allergic reaction.

Allergen is prone to trigger allergies among antigens. There is a wide variety of allergens, and it varies allergic symptoms.

Allergens include food, chemicals, pollen, dust, mites, pet hair and so on, which cause asthma, hives, dermatitis, fever, etc.

Among allergic diseases, in recent years, allergic rhinitis, such as atopic dermatitis, bronchial asthma, and hay fever, has soared. In addition, there is growing concern that atopic dermatitis and food allergies are spreading among infants and children.

A countermeasure for allergic diseases is to keep allergies away. We recommend it to maintain home cleanliness, have a regular life and a well-balanced diet.

Advancing the severity, drug therapy such as steroids is provided, but it is difficult to improve the fundamental constitution.

There is a case that we administer hydrogen therapy as a self-funded medical treatment to treat atopic dermatitis. Removing the active oxygen that caused inflammation normalizes the barrier function of the skin, which could improve immunity. This might also lead to control runaway allergic reactions and ease itches and eczema.

• **Cancer**

The cells that comprise the human body have genes in which information such as division, differentiation, and proliferation is engraved. Changing according to the information, cells usually grow and maintain life.

If the gene of a normal cell gets damaged, it mutates into a "cancer cell". Cancer cells behave in a manner that disobeys genetic information, such as disorderly growth and metastasis. When cancer cells proliferate, they form a mass, which turns into a "malignant tumor." The malignant tumor grows larger and spreads to the surrounding cells. After that, it metastasizes and infiltrates distant organs and tissues.

The largest difference between normal and cancer cells is how to produce ATP. In normal cells, intracellular mitochondria generate energy called ATP from oxygen and nutrients. Cancer cells make ATP from glucose without oxygen outside the mitochondria during their cessation of activity.

Currently, there are several approaches to standard care for cancer: extirpation, chemotherapy, hormone therapy, drug therapies such as molecular target drugs, and radiation therapy.

Depending on the type, stage, and nature of cancer, treatment methods are selected or combined to cure.

In hydrogen therapy, we consider that active oxygen contributes to genetic damage.

1. Cancer prevention

Antioxidants such as catechin and polyphenols that supposedly remove active oxygen cannot reach the genes in the interior cells owing to their large molecular weight. Ingestion of hydrogen with a small molecular weight by gas inhalation might remove active oxygen generated around the gene and prevent the increase in cancer cells.

2. Cancer treatment

As mentioned above, cancer cells are in a state with mitochondria being dormant. The administration of hydrogen to cancer cells by intravenous drip or injection awakens and activates mitochondria. Once it resumes producing energy, this might trigger apoptosis * and destroy cancer cells.

Although this mechanism does not cure cancer with certainty, they expected it to achieve some effect depending on the organ where cancer started and stage.

* A phenomenon in which cells slough off and destroy themselves to keep the individual in better condition.



●正常な状態



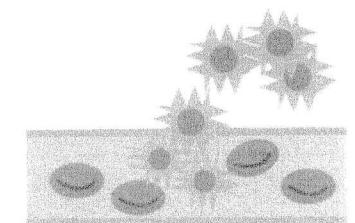
●遺伝子に傷が付き、
異常な細胞ができる



●異常な細胞が
増殖する（がん化）



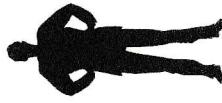
●異常な細胞がかたまりに
なる（腫瘍形成）、
周囲に広がりやすくなる



●血管などに入り込み、
全身に広がる（転移浸潤）

赤坂 A クリニク院長
獨協医科大学名誉教授 医学博士

森 吉臣 著



「水素の力」 で創出する 健康長寿 100歳社会



生活習慣病予防と
抗老化で若生き人生

Chapter 4

Various researches related

to hydrogen

Activities of "Hydrogen and Medical Research Group"

At the "General Incorporated Association Hydrogen and Medical Research Association" where I serve as the representative director, medical professionals who are active in the front lines in medical settings, such as doctors, dentists, basic research workers, and pharmacists, are advancing clinical and basic research on hydrogen.

The theme currently under studies are as follows:

1. Circulation / metabolism

The application and applicable dose of hydrogen for lifestyle diseases such as diabetes, hyperlipidemia, and hypertension.

2. Infertility measures

The improvement of the fertility rate by ameliorating the internal environment of hydrogen for the tendency of young women having early menopause.

3. Improvement of pain

Pain relief mechanism by administration of hydrogen (basic research), and application to pain of each disease.

In the future, the study group will not only pursue the capability of hydrogen but also contribute to society (medical innovation) by changing to conviction (building evidence).

From the next page, I will introduce some of the research introduced at the workshop held by the Hydrogen and Medical Research Group in the past, along with graphs.

Hydrogen selectively scavenges hydroxyl radicals

I have been researching active oxygen for over 30 years. When I learned about the antioxidant effect of hydrogen, I carried out various pilot studies. I would like to share one of them here. We experimented on whether hydrogen eliminated active oxygen and which active oxygen it could affect.

• Which active oxygen does hydrogen eliminate?

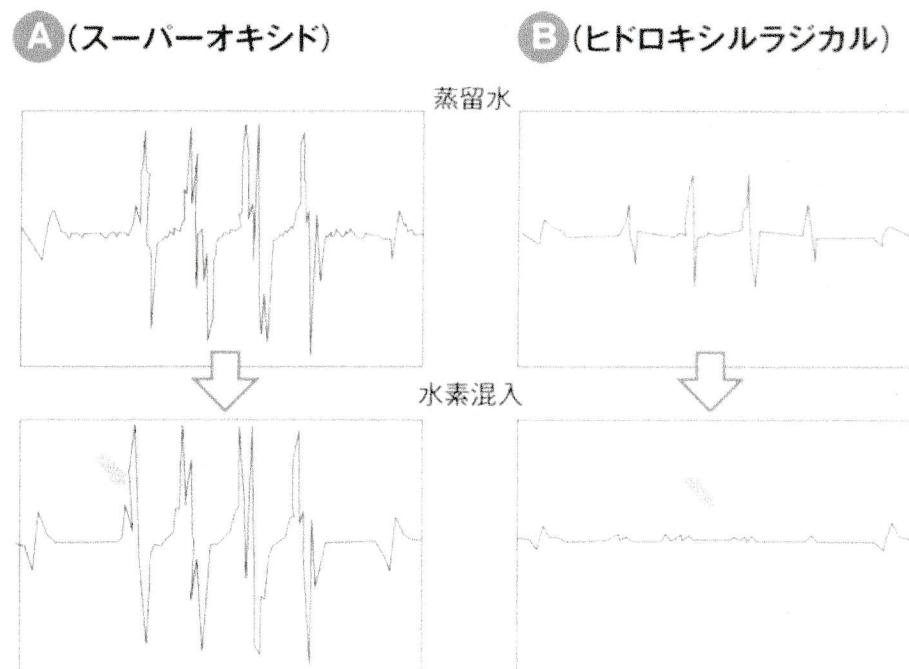
With the use of an electron spin resonance device (ESR), we conducted experiments on whether hydrogen scavenges active oxygen.

(A) We generated good active oxygen and superoxide in 500cc of distilled water. The graph illustrates a waveform peculiar to superoxide.

Next, when adding hydrogen (400 mg) to it, the waveform of superoxide does not change at all.

In other words, hydrogen eliminates totally no superoxide.

(B) Under the same conditions, we carried out experiments on bad active oxygen and hydroxyl radicals that are considered as factors to cause illness and aging, and generated hydroxyl radicals in 500cc of distilled water. In the graph, you can see the waveform peculiar to hydroxyl radicals.



Following this, when hydrogen (400 mg) was added to it, the waveform of hydroxyl radicals almost disappeared. This means that they have been scavenged by hydrogen.

In fact, it was proved that hydrogen selectively eliminates bad active oxygen and hydroxyl radicals.

• Does active oxygen decrease after taking hydrogen?

When administering hydrogen to patients, we measured it with FRAS (free radical analyzer) whether it can eliminate active oxygen. The measurement uses a small amount of blood collected from your fingertips.

The graph provides the data on when hydrogen is ingested for one week.

Although the number of d-ROMs (oxidative stress level) varied between individuals, all of theirs was downward.

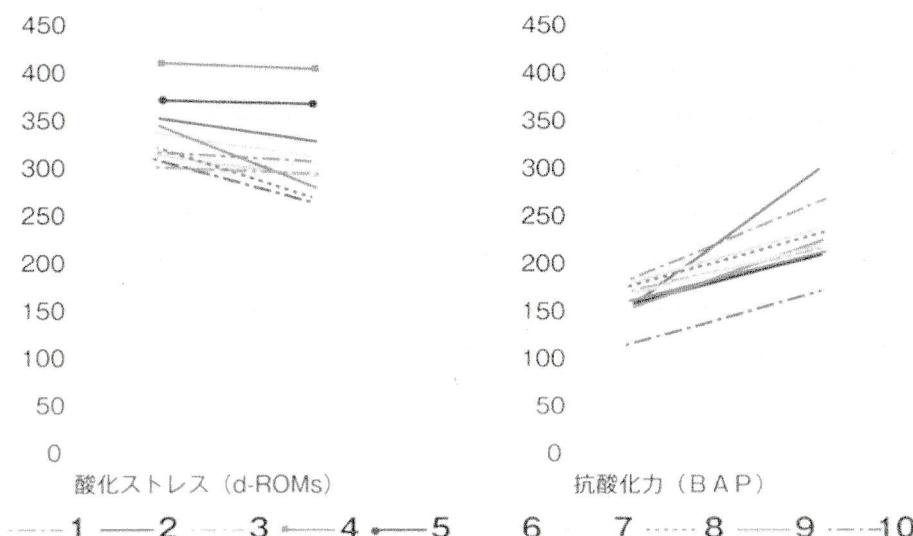
On the other hand, BAP (antioxidant power) was upward for all.

All in all, it was found that after ingesting for one week, the antioxidant power increased in the blood, and the oxidative stress was reduced.

酸化ストレス・抗酸化力の推移
(水素7日間服用前後)

These results from my very early experiments.

Hydrogen selectively eliminates only hydroxyl radicals that have negative effects on the human body, among active oxygen. In addition, continuous administration for one week reduces the degree of oxidative stress and increases the antioxidant power. We can say that the fact proved by experiments has led to the motivation for subsequent hydrogen research.



To improve diet, hydrogen, and fertility

Dr. Sadayoshi Idei, the director of Omiya Ladies Clinic conducted this research. He has studied the reasons patients do not become pregnant during fertility treatment from various angles.

While performing his treatment, he learned about the antioxidant called hydrogen. Trying it out, hydrogen showed the effect on fertility (the degree of a pregnancy likelihood).

Since the number of cases of the relationship between pregnancy and hydrogen is small, despite an interim report, I will introduce the published contents.

• Does hydrogen intake make it easier to get pregnant?

Hydrogen effectively controlling bad active oxygen and hydroxyl radicals generated in the body

1. Suppresses gene damage and creates a suitable environment for follicle development.
2. Promotes the increase in the number of follicles and recovery of fertility.
3. Changes the balance of antioxidants in the body.

The purpose is to analyze the above-mentioned.

The subjects are 10 to 12 people under the age of 35 who preserve ovarian function (currently 8 people have applied).

Provide 2 capsules containing hydrogen daily, twice in the morning and evening. Administering them for 2 months, acquire urine and blood sampling data before and after administration for statistical analysis.

(During all that time, no use of fertility drugs or injections that may affect ovarian function, but only timing guidance. In addition, refraining from vitamin C, coenzyme Q10, herbal medicine, brown rice and fermented food that have reduction action.)

• "Potentiality of pregnancy" changes over time

The number of ova in women is 7 million at about sixth months of intrauterine life, 2 to 3 million at birth, 200 to 300 thousand at the age of 13 to 14 and gradually declines, and then the physiology of women begins (cf. the graph "The Change of the Number of Ova with Age").

With regard to the change in fertility owing to aging, shown as in the graph "Decrease in fertility because of aging".

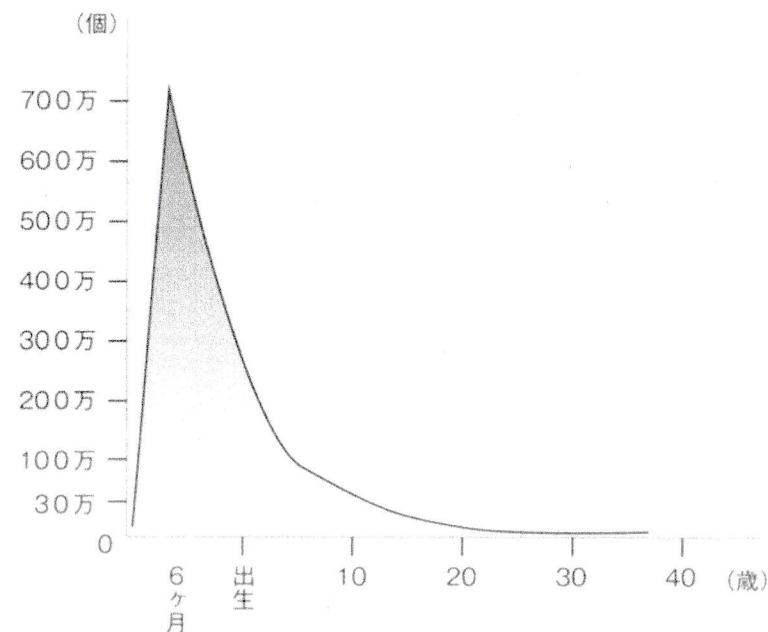
• AMH (anti-Mullerian hormone) that measures the capability of pregnancy

AMH (anti-Mullerian hormone) is the hormone secreted by developing follicles, and considered as an index to know the ovarian age of women (cf. the graph "The Value of Age and AMH").

There are many primordial follicles in the female ovaries by nature. From the first menstrual period, primordial follicles get active and mature into developing follicles, pre-antral follicles, antral follicles, and mature follicles, and ovulate taking about 190 days.

They secrete AMH from pre-antral follicles, and its measured value correlates with the number of developing follicles. In other words, measurement of the AMH concentration can measure the number of remaining follicles and estimate the ovarian age.

卵子数の年齢による変化



- After hydrogen intake, the number of follicles increases

See the graph "Confirmation of the increase in follicle number: AMH data". This is the measurement of changes in the number of follicles before and after taking hydrogen-containing capsules, regarding 4 cases out of the subjects.

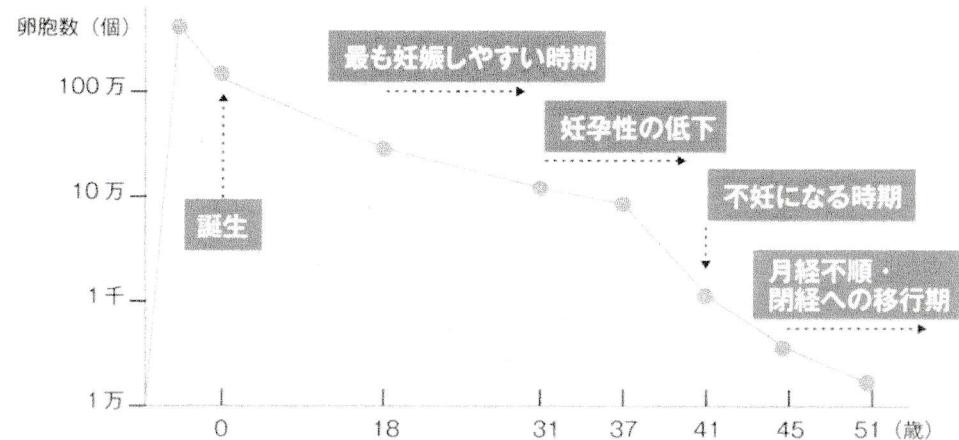
Except for case 3, the AMH value rose. In particular, the patient in case 1, whose ovarian age was 50 years old, could become pregnant.

What supports life is not only hydrogen but also if there were few trace elements of enzymes and folic acid, life would be unstable.

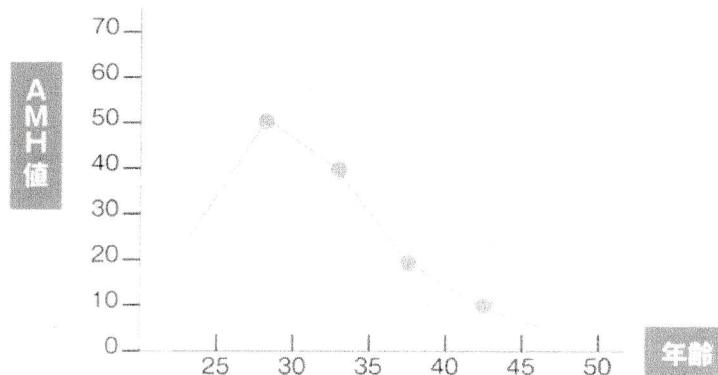
For instance, from the viewpoint of obstetrics and gynecology, folic acid is significantly involved in nerve construction, and the deficiency at 4 to 6 weeks of pregnancy causes neural tube defect and displays serious symptoms. Enough intakes of folic acid might reduce the risk by approximately 70 percent.

Hydrogen eliminates active oxygen and the various effects on infertility can be expected, however keep in mind that the results will differ depending on the individual constitution and the basic balanced diet is a prerequisite.

加齢による妊娠性の低下



年齢と AMH の値



卵胞数の増加の確認：AMH データ

症例	年齢	前	後	水素	期間
①※	32	3.0 未満	↑3.5	6 カプセル	3 ヶ月
②	34	3	↑4.2	6 カプセル	3 ヶ月
③	31	12.2	↓10.8	4 カプセル	2 ヶ月
④	35	5.8	↑6.1	4 カプセル	2 ヶ月
⑤	34	18.7		4 カプセル	2 ヶ月
⑥	28	50.5		4 カプセル	2 ヶ月
⑦	34	17.6		4 カプセル	2 ヶ月
⑧	21	20.6		4 カプセル	2 ヶ月

※卵巣年齢 50 歳で、治療終了時には妊娠 5 週が成立。

Hydrogen as a measure against oxidative stress in KAATSU training

Great effect with less load "Kaatsu training"

Kaatsu training is training that takes place under pressure. This training method was devised by Dr. Yoshiaki Sato, MD.

Apply pressure to the base of upper arms and legs with rubber bands etc. to limit blood flow into the muscle.

Performing a light loading motion in this condition, we pooled blood on the arms and legs. As a result, blood also flows to tissues in which no blood was previously running (neovascularization). Muscle tissue becomes anoxic and lactic acid increases. After the exercise, when removing the rubber band and decompressing, the blood will return to tissues at once. This leads to increased secretion volume of growth hormone and promotes muscle growth and fat burning. Improvement of blood circulation can be expected.

The biggest advantage of KAATSU training is that we can get a profound effect on a small load.

- **I secreted approximately 290 times more growth hormone**

What are the changes in the body caused by KAATSU training?

1. Lactic acid accumulates

We produce lactic acid when fast muscles are active. When compression restricts blood flow, it accumulates in the muscles.

2. I secreted growth hormone

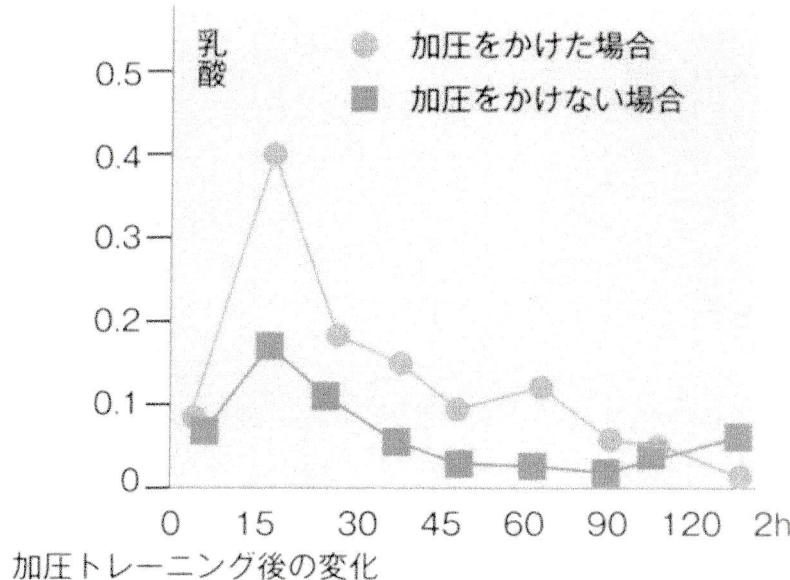
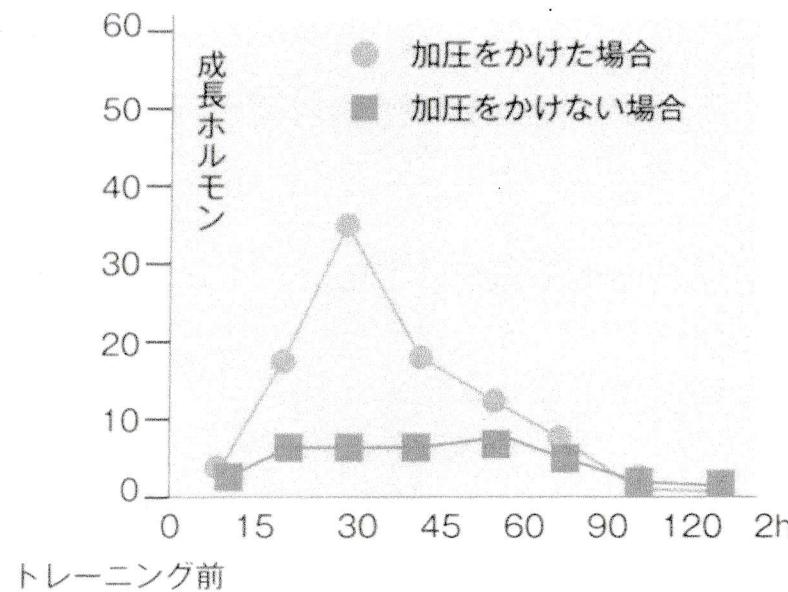
When lactic acid accumulates, the sensory nerves detect it, and then the hypothalamus of the brain issues a pituitary command to secrete growth hormone.

3. Nearly 290 times more growth hormone is secreted

After KAATSU training, they secrete growth hormone in the blood, which is about 10 times more compared to during normal training and about 290 times as against at rest.

The purpose of KAATSU training is: first, to release growth hormone to increase muscles, second, to burn body fat, third, to improve blood circulation, and so on.

Improvement of basal metabolic rate raises muscular and physical strength. By this, the effects of diet and aging care are also expected.



• Does hydrogen affect the effect of KAATSU training?

When dissolving a blood clot in the ischemic myocardium of a patient with myocardial infarction, blood resumes flowing, and a large amount of active oxygen increases because of the sudden rise in oxygen, which causes "ischemia-reperfusion injury" that induces necrosis of cells. Does active oxygen increase after decompression with KAATSU training? I conducted an experiment with the use of hydrogen (Although the number of cases is still small since it is being researched, I would like to report it).

Table 1 shows the measurement of changes in GH (growth hormone), lactic acid, d-ROMs (oxidative stress), and BAP (antioxidant power) after KAATSU training.

KAATSU training increases oxidative stress less than expected.

Table 2 illustrates the changes after hydrogen intake and KAATSU training.

As can be seen in measurement results, oxidative stress went up despite the ingestion of hydrogen. For KAATSU training, raising the lactic acid level is considerably important to increase growth hormone, and so we can say that it is good that hydrogen does not lower the lactic acid level so much.

Furthermore, the fact that the lactic acid level dropped dramatically after decompression supposedly means that the self-metabolism has improved. This might result from the pH in blood and body fluids slightly becoming alkaline after compression. In any case, I assume it is worthy of evaluation that the antioxidant power after pressurization has increased.

表1 加圧トレーニング後の変化

—乳酸値、酸化ストレス (d-ROMs)、抗酸化力 (BAP)、成長ホルモン (GH) —

項目	加圧前				加圧終了	除圧後3分			除圧後30分
	GH	乳酸	d-ROMs	BAP		乳酸	乳酸	d-ROMs	
1	178.1	2.9	237	2212	11	7.3	267	1843	181.2
2	169.2	3.4	283	2218	28.8	22.4	246	2671	177.8
3	278.3	6.2	320	2240	21	3.2	355	2426	265.3
4	173.5	2.5	241	2658	8.7	5	317	3215	179.5

表2 水素服用加圧トレーニング後の変化

—乳酸値、酸化ストレス (d-ROMs)、抗酸化力 (BAP)、成長ホルモン (GH) —

項目	加圧前				加圧終了	除圧後3分			除圧後30分
	GH	乳酸	d-ROMs	BAP		乳酸	乳酸	d-ROMs	
1	174.2	2	227	2523	12.4	6.2	269	2612	198.3
2	148.6	1.8	233	2365	26.6	2.3	124	4279	168.4
3	280.1	2.4	334	2475	9.6	2.9	421	2498	304.9
4	276.5	1.8	433	2614	11	7.8	455	2802	301.3

- **Hydrogen increases growth hormone**

Although the Lactic acid level temporarily went up owing to KAATSU training, the value fluctuated considerably in the state of pressurization. In addition, after KAATSU training, the increase in active oxygen was relatively mild, and what is more, all antioxidant power was upward.

Hydrogen does not suppress the increased lactic acid during pressurization. The lactic acid level, however, is inclined to fall quickly after decompression.

Those who had ingested hydrogen had a larger increase in GH (growth hormone) after compression.

Kaatsu training can be expected to strengthen antioxidant power as well as promote GH secretion and its effects. And besides, hydrogen intake could support these effects.

- **Hydrogen research conducted in various medical fields**

"Hydrogen and Medical Research Group" is also performing research in various other medical fields.

For example, Prof. Hideaki Sakata, a doctor of medicine, is conducting "research on the potential effects of hydrogen on sudden deafness."

Sudden deafness is a type of sensorineural hearing loss that suddenly becomes difficult to hear. Although the cause has not been clarified, there are "virus infection theory" and "inner ear circulatory disorder theory". The standard care administers steroids for about 2 weeks to cure.

In a clinical study, Prof. Sakata reported that administration of hydrogen to people with sudden deafness every 3 hours had resolved the bass disorder. This might suggest that hydrogen possesses the potential effectiveness in otolaryngology.

Moreover, Prof. Masaaki Tomohisa has published research on "cardiovascular disease and Waon therapy". For patients with the peripheral arterial disease who have difficulty in treatment with a catheter, he performed Waon therapy with thermal capsules,

reporting that after 6 months, patients restored to the state that they could walk over 1 km. He made a statement that in the future, he would verify the synergistic effect with the combined use of hydrogen on patients who were candidates for Waon therapy.

I would like to continue to promote the basic and clinical research on hydrogen and firmly verify its efficacy scientifically and medically.

Chapter 5

Method to ingest hydrogen

「水素の力」
で創出する
健康長寿
100歳社会



生活習慣病予防と
抗老化で若生き人生

森 吉臣 著



赤坂 A A クリニック院長
獨協医科大学名誉教授
医学博士

How to take hydrogen

Currently, there are several ways to ingest hydrogen.

• For medical use

In the medical settings, especially ones related to aging care, the number of clinics is increasing in which introduces hydrogen therapy

Examples are: explicating the sheet containing hydrogen to the affected part to relieve pain, evenly administering high-concentration hydrogen to the body by intravenous drip, and directly injecting a hydrogen solution into the affected part by injection. Someone can effectively administer high concentration hydrogen.

At the moment, I confirmed that hydrogen therapy is clinically effective in over 20 types of diseases such as hypertension, hyperlipidemia, arteriosclerosis, diabetes, rheumatoid arthritis, dementia, and allergies (atopic). We use it not only for the improvement and prevention of symptoms of illness but also for medical treatment aimed at improving metabolism and recovering from fatigue.

In 2016, we designated hydrogen gas inhalation therapy as advanced medical care B.

It is the world's first treatment method that inhales hydrogen gas together with oxygen. A sudden cardiac arrest that occurs outside the hospital because of arrhythmia and so on, might interfere with the function of organs including the brain, even though the heartbeat could be resumed by emergency resuscitation (post-cardiac arrest syndrome). If it happens, the case-fatality rate is approximately 30%. Although there are some cases of complete recovery and reintegration into society, a severe dysfunction often remains.

水素療法は20種類以上の疾患で臨床的な有効性を確認

・高血圧、高脂血症	・ぜんそく
・動脈硬化、心筋梗塞、脳梗塞	・認知症
・糖尿病	・歯周病
・関節リウマチ	・胃腸疾患
・パーキンソン病	・がん疾患（抗がん剤副作用軽減、再発予防）
・腎臓病、肝臓病	
・呼吸器疾患	・エイズ
・アレルギー（アトピー）	

Inhaling hydrogen gas (about 2%) improves the case-fatality rate by nearly 70%, reduces the risk of severe disability, and could be expected for a full recovery.

At present, hydrogen gas inhalation therapy is introduced in the field of emergency medical care.

• For beauty

Well, using the antioxidant effect of hydrogen, the number of beauty products as a measure against spots and wrinkles and for skin beautification is on the rise.

Hydrogen cosmetics blended with a magnesium base containing hydrogen react with water to generate hydrogens, which can be applied depending on the purpose, such as basic cosmetics for daily care, essence for damage care, and makeup base cream for UV care.

• As lifestyle behavior

We can ingest hydrogen in everyday life with no difficulty, for instance, drinking hydrogen water available in the market or made with a hydrogen generator, or taking a hydrogen supplement.

Recently, the hydrogen bus has been attracting attention. It can permeate and intake hydrogen through the skin of the entire body, as well as from steam. This would be an efficient method of hydrogen intake.

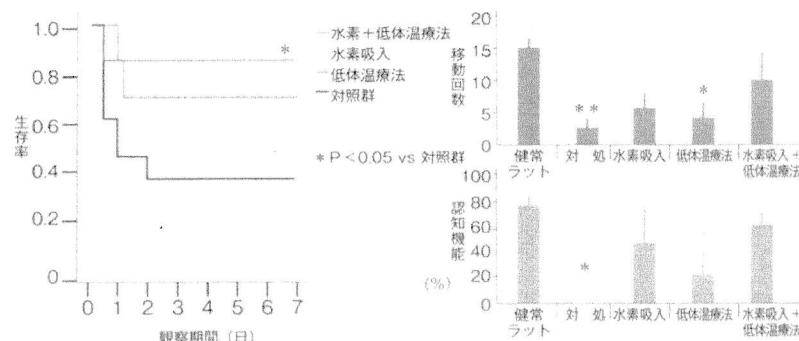
水素吸入は先進医療 B に指定 (2016 年 11 月 30 日)

2014 年度日本臨床応用生物学研究協議会

水素吸入療法による心肺停止組成後臓器障害抑制

慶應義塾大学医学部循環器内科 佐野元昭

6 分間の心肺停止状態のラットモデル実験において、水素吸入群では、低体温法と同様の救命効果があり、低体温法と水素吸入群で最も効果が認められた。



Drink hydrogen water

• Commercially available hydrogen water

Hydrogen water is the easiest way to ingest hydrogen, and has been already sold by various companies.

The benchmark when selecting commercially available hydrogen water is hydrogen concentration of 0.899 ppm or more. The higher the numerical value, the more hydrogen you can ingest. Since hydrogen being the smallest molecule, if the container was a PET bottle, it would escape to the outside. So it would be wise to choose one in an aluminum can or a pouch-type container. Once opening the cap and hydrogen is exposed to the air, they will release it more and more. We highly recommended drinking it all at once as much as possible.

We classify hydrogen water as "soft drink", and the sign of the expiration date is obligatory. When purchasing, be sure to check the expiration date, and then finish it early.

In addition, it is sensitive to environmental changes. After opening, instead of pouring into a cup or other containers, drink from the container as you bought.

• Hydrogen water server

Nowadays, there are many hydrogen water servers and hydrogen water generators on the market that can make hydrogen water in the office or at home.

Hydrogen has its drawback that it escapes once contacting with air. Freshly produced hydrogen water, however, definitely allows us to ingest a certain amount of hydrogen.

When hydrogen water is boiled, it releases hydrogen. Even if you use hydrogen water to cook or make hot drinks, it cannot intake hydrogen. In the case if you want to warm it so badly, placing it in the hot water is recommended.

These days, the number of places is increasing where permanently installed hydrogen water servers, such as fitness gyms. It would be more effective to drink hydrogen water before and after exercise, which is worth trying.

Since it is tasteless and odorless, you could drink it with the same feeling as ordinary water. Therefore, this might be the most familiar hydrogen intake method in daily life.

- **Take from hydrogen supplements**

The intake of hydrogen supplements is also a good way to ingest high concentrations of hydrogen with no difficulty.

The specially developed technology fills minerals with hydrogen, and they generate hydrogen in the intestines by reacting with water in the body after drinking. The technical details and the content of hydrogen that we can ingest differ depending on the product, so that it is better to check them carefully before purchasing.

Even With hydrogen water, there is a risk that hydrogen would escape depending on the preservation state), which allows us to drink it at ease.

Since it is portable and enables us to drink it whenever going out or traveling, the proper daily intake is possible.

It would be workable for those who are prohibited to take a large amount of water due to kidney disease and so on, as well as the elderly who cannot drink a lot of water at once.

Hydrogen supplements can be expected to have various effects on not only beauty but also maintaining health. If you are in bad shape or getting sick, you ought to consult your doctor to adjust the number of supplements as your symptoms change.

- **Absorb hydrogen through the skin of the whole body in a hydrogen bath**

As mentioned above, there are various methods to ingest hydrogen nowadays. Among them, the "hydrogen bath" is currently drawing the most attention because of its efficiency in ingesting hydrogen.

Hydrogen water and supplements are also effective ways to take hydrogen into the body.

Nevertheless, taking in a large amount of hydrogen would irritate the stomach.

The hydrogen bath might be suitable for the hydrogen intake in daily life without irritation of the stomach.

Calculating the surface area of adult skin, it is about 1.7 square meters (in the case of height 170 cm and weight 60 kg, calculated by DuBois' formula), in brief, "one tatami mat" size.

Since continuously administering hydrogen to this amount of area for 10 to 15 minutes all at once, the intake will be considerable. With a bathroom filled with steam containing hydrogen, it is also possible to take hydrogen in through the nose in addition to the skin. A hydrogen bath that warms the body from the core and gives a relaxed feeling is suitable as a habit to maintain beauty and health.

Combined with fine bubbles that promote hydrogen penetration

• Fine bubble that allows hydrogen to penetrate more

In recent years, research has advanced to promote the absorption of hydrogen that is hard to dissolve in water, and complement its functions.

Take the conversion of hydrogen into fine bubbles, for example.

Fine bubbles are extremely small bubbles ranging from nanometer (1/1 billion meter) to micrometer (1/1 million meter). They have distinctive properties different from ordinary bubbles: the ability to stay floating in water for long periods without being quickly released, and to contain. We have adopted these characteristics to various industrial fields such as water purification, liquid crystal and semiconductor cleaning, and seafood sterilization.

"Fine bubbles of hydrogen" that this technology mixes with nano-sized hydrogen densely entrap high-concentration hydrogen, and keeps it inside. Normally, when hydrogen is dissolved in water, it reaches a level of saturation at 1.6 ppm. With fine bubbles, however, they can dissolve dozens of times more hydrogen.

• Fine bubble hydrogen bath

"Fine bubble hydrogen bath" generates fine bubbles that contain a considerable amount of hydrogen compared to a normal hydrogen bath and entraps them in water. By this, it can keep hydrogen in water for a long time.

The skin of the entire body, its surface area equivalent to one tatami mat, is able to ingest high-concentration hydrogen on a second-by-second basis. There is also the result that we detected hydrogen in the exhaled breath within 10 minutes after bathing.

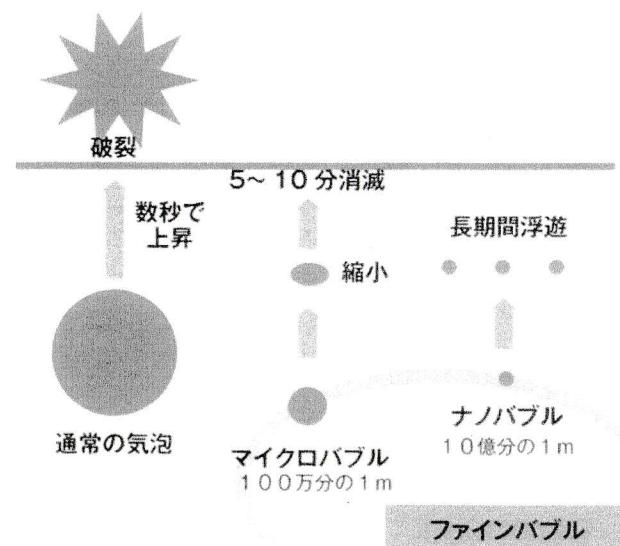
We can expect that an enormous amount of hydrogen ingested from the skin and scalp would maintain the environment for creating hair and beautiful skin and keep them healthy.

• High cleaning effect

Since the size of the pores is approximately 20 to 50 μm , fine bubbles with an enormous amount of hydrogen easily penetrate the deep inside of pores, combine with dirty substances and then pop out. The impact removes and floats waste products and unwanted dead skin cells that have accumulated in the pores, which can lead to the high cleaning effect.

Furthermore, the energy released when the fine bubbles burst gives a massage effect to the skin, and simultaneously, 100 thousand negative ions per a milliliter, which is equal to tens of times that of the natural world, are generated.

When the human body is deficient in negative ions, in an oxidized state, the zeta electrification on the surface of red blood cells weakens and the agglutination begins, which induces blood to thicken and blood flow to decrease. After that, the cell environment deteriorates rapidly, and the excessively increased active oxygen damages normal cell membranes and genes.



The body absorbs the part of many negative ions that fine bubbles have generated on the surface of the skin, together with hydrogen

Effect of hydrogen + fine bubble + bicarbonate ion

There is also the bath, whose function combines a fine bubble hydrogen bath with a bicarbonate ion generator. Bicarbonate ion is the one dissolving in hot water produced when period, the body easily gets warmer, and bicarbonate ions widen the pores, and enhance the cleaning effect and hydrogen absorption efficiency.

Hydrogen, fine bubbles, and bicarbonate ions. These three would bring a beneficial effect on health.

The biggest advantage of the hydrogen bath is that anyone can easily start it because of the habit of bathing that is rooted in the Japanese lifestyle.



ファインバブルと重炭酸イオンの効能をミックスした水素バスも登場

Chapter 6

Hydrogen introduced to
the field of "medical care"
and "health"



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Hydrogen therapy at the clinic

Recently, the number of clinics is on the rise where it positively provides treatment with the use of hydrogen as a self-funded medical treatment, and is dedicated to medical prevention and aging care.

What kind of hydrogen therapy is currently being performed at the clinic?

- **Intravenous drip**

Intravenous drip is effective to spread hydrogen throughout the body.

It uses saline solution in which hydrogen is dissolved. When 1.6 ppm of hydrogen is added, it reaches a saturation point, and so in the past, the admonition with a higher concentration was impossible. However, the invention of nano-sized hydrogen allowed the production of a hydrogen physiological saline solution with a high concentration of 4 ppm. It has developed to a level where sufficient effects can be expected for medical use. Besides hydrogen, there is also intravenous drip blended with other active ingredients such as + Vitamin C and + Myers Cocktail * to enhance the effect.

We also use it in the fields of preventive and aesthetic medicine, and as a measure against lifestyle diseases regularly.

* A reproduction of the intravenous drip prescribed by US Dr. John Myers. has reported various effects because of an intravenous drip of only vitamins and minerals, nutrients present in the body.

- **Hydrogen inhalation**

Hydrogen gas explodes when it exceeds 4%, and so it is necessary to properly control it. Although hydrogen gas inhalation therapy for patients with post-cardiac arrest syndrome was approved as advanced medical treatment B in December 2016, hydrogen inhalation is set to 2% for 18 hours. Since the high-cost medical care system applies to advanced medical care, even though the cost related to advanced medical care is private expenses, we can apply insurance to other examinations.

There are clinics (a self-funded medical treatment) and salons that perform hydrogen inhalation for recovery from fatigue and aging care, where hydrogen can be taken in efficiently.

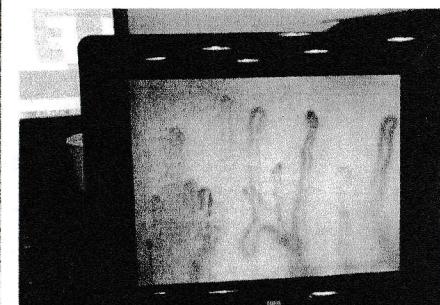
• Local injection

Hydrogen also has the effect of relieving pain. For orthopedic symptoms such as muscular pains we administered the hydrogen injection to the affected area. Since it acts directly on the painful area to reduce inflammation and improve pain relief and blood circulation, we mainly used it to treat stiff shoulders, lower back pains, and osteoarthritis of the knees and hips.

There are also some cases that these hydrogen therapies affected blood flow, and reactivated ghost blood vessels with poor blood flow (the state that capillaries stretching throughout the body disappeared like ghosts and became unseen) by the administration of hydrogen. Although the anti-oxidative effect of hydrogen was already theoretically proven at the dawn of hydrogen therapy, it was seemingly difficult to gain the remarkable effect owing to the low concentration of intravenous drip, injection solution, inhaled gas, etc.

Over ten years have passed since then, and as technology develops, it has become possible to realize various high-concentration hydrogen such as nanotechnology and HHO gas.

In the future, I have high expectations that hydrogen therapy would achieve the improvement of symptoms and radical treatment of various diseases.



(左) 水素吸入後、血流状態をチェック (右) 血液の流れがよくなつたことを確認

Hydrogen to more people

In 2018, a new qualification, a specialist in hydrogen health, was created, "Hydrogen health qualification certified person" (Hydrogen Health Promotion Association).

It is a specialist who uses hydrogen not only for the purpose of "creating one's own health with one's own hands" but also for "making one's family and friends healthy". The aim is to gain specialized knowledge about hydrogen and the characteristics and effects of hydrogen-related products in order to respond to consultations from general consumers.

After completing the prescribed on-the-job training and passing the exam, the acquisition of the qualification is approved by registering as a qualified member. The hydrogen health certification system has three levels of qualifications, depending on the experience of hydrogen intake, and the practice and practical ability of dissemination and enlightenment activities.

- **Level 1 "Hydrogen Health Advisor"**

Has basic knowledge about hydrogen health and can give advice in response to consultations on hydrogen health from general consumers.

- **Level 2 "Hydrogen Health Instructor"**

Has practical knowledge about hydrogen health and can serve as a lecturer of hydrogen health at hydrogen salons and seminars.

- **Level 3 "Hydrogen Health Meister"**

is able to open a hydrogen salon, train a hydrogen health qualification certified person, and provide practical guidance. (On the condition of hydrogen health instructor and equivalent qualification holder with at least 3 years of work experience)

"Hydrogen health qualification certified person" firstly achieves health promotion by ingesting hydrogen, secondly learns about the possibility that hydrogen could usefully act on chronic diseases such as diabetes, hypertension and cancer that are considered as lifestyle diseases, specific diseases induced by active oxygen excessively producing in the body, dementia, Parkinson's disease, collagen diseases such as rheumatism and so on, and last but not least takes the initiative in promoting health with the use of hydrogen.

If this qualification system was socially recognized and circulated, it would be possible to further spread the potential of hydrogen to the world from fields different from medical care.

Conclusion: Hydrogen potential to be revealed in the future

This book has explained about hydrogen that is far from being fully understood yet in the world today.

Could you learn or discover anything new?

Even in the medical field, it was only in recent years that the potential of hydrogen began drawing attention.

The natural sciences established in the West have explained general principles and mechanisms based on the "visible phenomena" on the earth. Along with the natural law derived from it, practical science has been developing in order for people to live better lives. Therefore, we can say that medicine is one of them. As science progressed, it became practical to believe in what was visible, and then the period had lasted long when it was considered unscientific to believe in something invisible.

In the modern world, however, things that were invisible to human eyes have become visible thanks to the development of science and technology such as electron microscopes. This also brought science to the next level. The same goes for genetic engineering, quantum mechanics, molecular nutrition, and not to mention medicine as well

The era might have already arrived when does not apply the practical sense of the invisible = unscientific.

Rather, how much we analyze and use invisible things is becoming more and more important

Naked eyes cannot see hydrogen, however, it became possible now to see the chemical reaction in the data. In addition, It is also becoming clearer that hydrogen affects the human body in various ways. As I mentioned in this book, hydrogen has splendid power and the potential that has not been fully clarified yet. I assume it is necessary for everyone who would use hydrogen to take an attitude of exploring and believing the invisible. Those who handle and provide hydrogen, healthcare professionals and companies, are required to work on them with more caution.

In the past, commercially available hydrogen water aroused controversy. Despite being labeled as hydrogen water, it did not contain any hydrogen. The cause was that hydrogen was released from the PET bottle, since commercializing it without fully understanding the properties of hydrogen. It is very disappointing that the incident has created a negative impression of hydrogen.

A couple of years has passed since then, and research on hydrogen has progressed further. Nowadays, there are many products on the market that have been developed after properly understanding the property. I highly recommend it for everyone to gain the knowledge to distinguish something we cannot see with our eyes, select the most suitable hydrogen-related products, and use them. I have also introduced the technology to control hydrogen in the medical field. Higher concentrations of hydrogen compared can expect various possibilities with the use of regenerative medicine, as well as the combined use of regenerative and conventional medicine.

Conventional medical treatment has diagnosed and treated diseases, so to speak, at the organ level.

At present times, the condition inside the patient's body can be detected at the cellular level. We are entering the era of diagnosing and treating diseases at the cellular level. Although human life activities are very minute, the mechanism itself is simple, and various adjustments are made at the molecular level. If the balance is lost, it would develop into an illness. Various mechanisms that control human physical functions such as autonomic nerves, blood calcium concentration, immunity, and blood sugar maintain a physical condition while maintaining an exquisite balance. The body knows much more about this balance than our consciousness, and so it would be better to leave everything to its coordinating ability.

Large substances such as medicine and supplements cannot intervene in such micro-level mechanisms. In the end, what we require is the ability of micro-substance, "hydrogen".

Hydrogen, the existence which overflows in the universe and is too close to humans. For that reason, it has been a long time before realizing the power of hydrogen. The opening period of Hydrogen research has finally launched. From now on, it would be at a remarkable speed to explain the potential ability of hydrogen and develop the utilization.

I will continue to devote myself to clinical and research activities toward the big issue, "fundamental cure of illness".

I also would like everyone to make the best use of the power of hydrogen and aim for the healthy 100-year longevity.

July 2018 Yoshiomi Mori

About the author

Yoshiomi Mori

Is a medical doctor, the chairman of the medical corporation Kenwakakai and the director of Akasaka AA Clinic.

Born in Kanagawa prefecture in 1943. After graduating from the medical department at Nihon University, graduated from the Graduate School of Medicine at Nihon University. Working at the Kidney Laboratory at California University in the USA, became Deputy Director of Koshigaya Hospital at Dokkyo Medical University. In 2005, opened the Akasaka Anti-Aging Clinic and has been an incumbent since 2009.

Researched pathology in graduate school. Presided over the laboratory as a professor and devoted himself to research and medical care at Dokkyo Medical University for about 20 years. From his perspective as a pathologist, keenly felt the importance of preventive medicine and started studying aging care medicine. Launched a clinic to familiarize aging care medicine which fell behind the West, to Japan.

Has also researched active oxygen, the cause of aging and illness, for many years. During that time, I encountered "hydrogen" and realized the potential of its antioxidant power. Was convinced that hydrogen would have remarkable effects on preventive medicine and aging care, and has been conducting medical treatment and research activities to collect the evidence. Aims to spread cutting-edge aging care medicine in Japan and establish medical care to prevent aging and illness.

The emeritus professor at Dokkyo Medical University. The director of the Hydrogen Health Promotion Association.