

# A review of vitamin E and immune response in senior citizens

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**Abstract:** Thailand has stepped into Active Aging society. There are changes and results in various fields.

Therefore, one of the issues that should be emphasized is that the elderly are in good health. Humans when entering the elderly physical systems began to deteriorate. The functioning of the body began to deteriorate and get disease more easily. The functioning of the system in the body and the immune system is reduced.

Vitamin E is an important fat-soluble component in the cellular antioxidant defense system and is obtained only from food. Vitamin E has important antioxidant properties that occur in metabolic processes both in the body and from the environment by preventing the oxidation of fat to prevent free radicals from destroying cells and tissues. A disease related to cell degeneration review of the literature mentions consequences of age-related deterioration of the body. Function and role of vitamin E in human health especially in the elderly and certain diseases, including factors that weaken the immune system. How do vitamins affect the immune system in senior citizens.

**Keywords:** immune system, Vitamin E, senior citizens.

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## 1. INTRODUCTION

Thailand has a low birth rate. While the aging trend continues to increase in 2019 and in 2022, Thailand has a population of 66,165,261, of which 12,116,199 are elderly. as a percentage 18.3 [1]. The reason why Thailand has stepped into Completely aging society and In 2033, there is a tendency to become an aging society at the highest level, with an elderly population ratio of 28% of the total population. As a result, the working age is in high demand. There was a shortage of workers. The government's fiscal crisis, including lower taxation and welfare for the elderly. Therefore, one of the issues that should be emphasized is that the elderly are in good health.

It also results in income stability of the elderly who are still involved in the labor force. [2]

In which good health and hygienic care. It will help reduce the chances of disease or health problems that often occur when entering old age (Dr. Thanyaporn Tansakul).

The elderly are those aged 60 years and over who often face physical and mental health problems.

The deterioration of the body continues with increasing age. Until a certain age, which is an age that has clearly changed many aspects.

### Physical change

External organs Hair turns gray or white, arched back, wrinkled skin, dry fingernails and toenails, hard, brittle, tear easily.

Movement slows down decreased muscle strength As a result, it becomes more difficult to sit. Take short strides, fall easily.

Vision: ptosis, eyeball and pupil become smaller and the reaction to light of the iris is reduced affects adaptation in the dark need more light. His eyesight became longer and he could not see clearly.

Dry eye disease ,Caused by the lacrimal glands producing less tears. and dizziness which is caused by deterioration of the eyeball muscles. In addition to increasing age, diseases such as diabetes, glaucoma, cataracts, macular degeneration. It may be the cause of decreased vision problems.

Hearing, often with tinnitus or deafness due to the deterioration of the auditory nerve, lower tones can be heard more clearly than normal speech. Difficulty distinguishing speech from noise makes it incomprehensible.

Speech does not have the vocalization power of the elderly. This is because the cartilage around the larynx is hardened and lacks flexibility.

olfactory impaired people do not smell food or nosebleeds due to high blood pressure in some people.

Bones and muscles are thinner, making them brittle and easy to break and muscle atrophy. There is fat in the muscles.

Hormones and emotions decrease production of chemicals in the body. This causes confusion, anxiety, anxiety, and depression, including insomnia, difficulty falling asleep, and waking up often due to physical conditions that change with age. Other causes may include stress, anxiety, depression, breathing problems or snoring, acid reflux, frequent urination at night. Side effects from medications.[3][4]

### **Changes in the internal systems of the body**

#### **Nervous system**

The nervous system and brain work slower. The connection between the brain and muscles and joints begins to lose make poor balance caused by the death of nerve cells, there is no recurrence make a bad memory decreased learning ability decreased reaction to things feeling and movement.

#### **Cardiovascular system**

The walls inside the blood vessels become thicker. If there is clogged fat will make the heart work harder, high blood pressure and be prone to heart failure.

#### **Respiratory system**

Feeling tired when breathing. If doing strenuous activity often short of breath because the strength of the respiratory muscles is reduced. Proper exercise can also help.

#### **Urinary system**

Most of them have urinary incontinence problems due to the smaller bladder causing frequent urination. Especially men have enlarged prostate problems causing the night to get up to urinate frequently and have to strain to urinate for a long time.

#### **Digestive system**

Roots are brittle and easy to break and have difficulty swallowing because of hard work because less gastric juice in the stomach.

#### **Endocrine system**

There is less functioning of glands such as the pituitary gland, thyroid gland, resulting in less hormone production. The pancreas produces less insulin cause high blood sugar are more likely to develop diabetes. [4]

People when entering the elderly. Systems began to deteriorate. When the functioning of the body begins to deteriorate, diseases come in easily and illnesses at this age are difficult to prevent. The most common diseases in the elderly are as follows:

#### **The most common neurological and brain diseases**

Ischemic stroke caused by the deterioration of blood vessels from the adhesion of fat or limestone, the walls of blood vessels are thickened inside. narrowing of the veins and less blood circulating. It is more common in the elderly with diabetes, obesity, heart disease, high blood pressure, stress, smoking and lack of exercise.

Alzheimer's disease Dementia in the elderly, symptoms include forgetfulness, decreased intelligence, mood changes. It is most likely caused by Alzheimer's disease. caused by the cells in the brain stop working makes the brain work harder.

#### Ischemic heart disease

This disease is caused by the hardening of the coronary arteries because fat accumulates in the inner wall of blood vessels until blocking the flow of blood causes ischemic heart disease. The risk factors, in addition to age, sex and family history, often found in people with diabetes, high blood pressure and various risk factors. It comes from daily living, diet and lack of exercise.[5]

#### Bone disease

As you get older, your bone strength decreases. The bone diseases that the elderly are at risk are as follows:

osteoporosis ,It is a common disease in elderly women. It is mainly caused by decreased hormonal function especially menopause. It is a condition in which bone density and bone mass decreases make bones fragile, deteriorated and easily broken areas that often show symptoms are the hips, wrists, and spine, or begin to change shape, such as a hunched back, bent shoulders, or a shorter stature, etc. [6]

osteoarthritis ,it is caused by using knee joints for a long time and taking too much body weight. The symptoms found are joint pain and swelling, joint stiffness, or a deformed leg shape. I can't stretch my legs to the end Deformed knees or bent legs.

#### Eye disease

Eye diseases that are common in the elderly include macular degeneration, cataract, glaucoma, etc., although it can be caused by many reasons and have different symptoms but most of the causes of eye disease are degenerative due to older age reduced vision.

Diabetes is another disease that is more common in the elderly caused by a malfunction of the body with insufficient production of the hormone insulin. Insulin resistance (rice, starch), protein and fat. The lack of insulin or the hormone insulin is less active. The body is unable to use blood sugar normally resulting in high blood sugar levels which if the sugar level is not controlled to be normal or leave it for a long time may cause complications such as blurred vision, blindness, kidney degeneration, numbness at the tip of the toes and can be easily infected.

Kidney disease more waste congestion affects the functioning of tissues, organs leading to chronic renal failure often exhibits symptoms of fatigue, swelling, fatigue, high blood pressure, anorexia, urinary tract abnormalities.

#### High blood pressure

Blood pressure will increase with increasing age including those who are overweight or in a state of obesity, it will increase the resistance of the blood vessels in the body. Normally, the average person's blood pressure shouldn't exceed 120/80 - 139/89 mmHg which if there is more pressure. It is classified as a person with high blood pressure. If the blood pressure is very high. There will be symptoms such as severe headache, shortness of breath, blackouts, blurred vision. Physical changes affect the elderly including important matters such as eating which affects the nutrition of the elderly. It can be said that it is an age that has to pay more attention to oral health problems. [7]

Oral health problems are a condition in which the elderly have oral diseases both in the mouth, inside the mouth, teeth or tongue, etc., which are caused by wearing dentures is inappropriate and inappropriate. Drinking stain-causing beverages such as tea/coffee, the bones are thicker and less vigorous or having high blood sugar levels can also affect your health. Characteristics that older people tend to be:

- 1.Oral health problems such as loose teeth, tooth decay and root decay gingivitis Ulcers and oral cancer which cause tooth loss. It is necessary to have dentures to use as a replacement and must always be observed to avoid oral problems. Old dentures can result in a fungal infection in the mouth. Dry mouth is caused by an inability to produce saliva or some systemic diseases or some drugs that give side effects.
2. The ability to distinguish taste, sour, sweet, bitter, salty and smell is reduced, causing doesn't has an appetite.
3. Problems with digestion and absorption, decreased gastric juice, and the muscles of the stomach and intestines do not work properly make food difficult to digest bacteria accumulate in the intestines and release gas cause bloating and constipation.

When the elderly have problems eating, eating less food or digestive problems resulting in insufficient nutrition affects the system in the body and the immune system.[4][8]

According to the Thai Elderly Health Survey 2013, it was found that Thai elderly Sickness rates were as follows: hypertension 41%, diabetes 18%, osteoarthritis 9%, disability 6%, depression 1%, bedridden 1%, and only 5% were diagnosed by doctor and have no health problems. [9]

When there are physical and mental changes focusing on proper nutrition for Slowing down the deterioration of health is important.

## 2. BACKGROUND

### Immunity and elderly people

The immune system is a body system made up of several subsystems. They work together to fight germs that are already in the body or that have just arrived. The system has clearly changed in the deterioration of aging is a cell-dependent immune system. The elderly have disabilities in this system that increase the incidence of tuberculosis and shingles in the elderly. There are also studies showing that the incidence of various types of cancer. The increase is likely caused by a weakened cell-dependent immune system. The elderly's body reacts strangely with a strange immune system. This makes the symptoms and symptoms displayed after the illness are different from the general patients as well.

For example, the condition in which the body temperature does not rise or the backbone is lowered in infection in the blood, etc. (Prof. Dr. Prasert Assantachai)

### Structure and source of vitamin E

Vitamin E is in the fat-soluble vitamins. The body cannot produce it on its own need to get from eating and collected in the liver fat tissue, heart, muscle but will accumulate in the body for a short time. It is found naturally in food in the form of mixed tocopherols, consisting of d-alpha tocopherol, d-beta tocopherol, d-gamma tocopherol and d-delta tocopherol each tocopherol complements each other with the function of eliminating different types of free radicals. Therefore, vitamin E is valuable as a vitamin that resists free radicals as well including absorption and use by the body.[7]

Vitamin E has important antioxidant properties that occur in metabolic processes both in the body and from the environment by preventing the oxidation of fat to prevent free radicals from destroying cells and tissues. A disease related to cell degeneration which is found in vegetable fats, beans, green leafy vegetables, found in grain oils such as soybean oil, rice bran oil, safflower oil nuts, peanuts and sunflower seeds or animal fats, such as cow's milk, human milk, cod liver oil, eggs, liver, meat. It is also found in supplement form.[7]

### The role of vitamin E in the immune system

Vitamin E is responsible as an antioxidant because vitamin E is used in the cell walls of white blood cells so it can react with free radicals which are produced during an immune response. In addition to increasing white blood cells, cell age will also increase. Has properties that help the body work efficiently and the most important function is to be an antioxidant. Help to protect cells from being destroyed by free radicals. When metabolism occurs in the body free radicals cause damage to the cells of the cardiovascular system, brain cells, and skin cells, which is one of the main causes of premature aging and found that getting the right vitamin E. It can help repair the wear and tear of hair, skin and nails. It also helps to inhibit the deterioration of the skin and help slow down aging. Vitamin E can prevent various chronic diseases and also helps strengthen the body's immune system stronger. [7]

Vitamin E, Doctors always recommend taking vitamin E supplements. Medical reports confirm the benefits of vitamin E that it can be used to protect the body from various deterioration for example, it is used in Alzheimer's disease, Parkinson's disease, skin care and cardiovascular system while we are alive free radicals are produced all the time and if eating enough antioxidants will cause the risk of cell damage.

Prevent deterioration

Due to the current lifestyle many environments are encountered that can stimulate the body to produce too many free radicals beyond the body's ability to eliminate them. This causes these free radicals to attack cells and deterioration, such as skin cells, heart, brain, blood vessel walls, etc., observed from having dry skin have symptoms similar to a shortening of memory as they get older. Vitamin E has the effect of being an antioxidant. Help prevent cells from being destroyed and help new cells to be strong does not deteriorate faster than it should.

#### Protect skin

In Germany, a study and research by the Dermatology Research Society found that Vitamin E can help skin cells withstand UV B rays in the sun. In a study, volunteers who were given vitamin E 1000 international units combined with vitamin C 2,000 mg daily for 3 months showed that the skin's resistance to damage doubled. Therefore, regular intake of vitamin E will help slow down the deterioration of skin cells.

#### Protect the heart

In addition to protecting the skin, vitamin E will help prevent clogging of the blood vessels that supply the heart and prevent the adhesion of platelets to make the blood vessels that flow to the heart to work more efficiently, according to a research report of the University of Cambridge in England. It was found that patients who received 400-800 international units of natural vitamin E daily had a 77% reduction in the incidence of acute heart attack compared to those who did not receive vitamin E.

#### Help with blood pressure

As you know, vitamin E is one of the fat-soluble vitamins. The body needs it as a component of cell membranes. The benefit of vitamin E is to prevent the breakdown of blood cells, prevent blood clots anti oxidant and prevent inflammation.

The part related to the blood system was found people with mild to moderate hypertension are having systolic pressure in the range of 140-160 mm Hg. and diastolic pressure is 90-100 mm Hg. When taking 200 IU of vitamin E daily for 6-7 months, there was a significant reduction in blood pressure.

#### Protect the brain

In addition, the benefits that help protect the heart and brain. Vitamin E also has important properties that help prevent neurological disorders because vitamin E is a fat-soluble vitamin, it can pass through the brain cells.

Abroad, a large amount of research data has been compiled overseas, concluding that a moderate dose of vitamin E of about 200-500 international units reduces the risk of Parkinson's disease and research shows that taking high doses of vitamin E about 2,000 international units can also prevent the oxidation of cells in the brain that work on memory. This makes it possible to prevent Alzheimer's disease in the elderly.

#### Reduce the risk of cancer

There are research reports that vitamin E can prevent nitrosamines. (Which is a carcinogen that we often get from food) to destroy cells in the body. It also increases the immunity to the body as well. The results of the research found that Vitamin E intake in the size of people who should receive natural vitamin E to strengthen the body can reduce the incidence of prostate and breast cancers. [7]

Who should supplement vitamin E to strengthen the body.

- Who need essential antioxidants that help slow down the degeneration of cells and organs
- Who has problems with the immune system
- Who want to prevent brain diseases such as Alzheimer's or Parkinson's disease
- Who want to prevent cardiovascular problems
- Who is deficiency in vitamin E this may be caused by abnormal absorption of vitamin E in the gastrointestinal tract.
- Who has skin problems such as lack of moisture or skin with scars
- Who have a family history of cancer
- Who has problems with premenstrual symptoms and have regular menstrual pain.[7]

Factors that weaken the immune system

eating unhealthy food

Eating less fruits and vegetables as a result, the body doesn't receive enough vitamins to strengthen the immune system.

accumulated stress

Due to stress hormones will weaken the immune system until the body is at risk of infection.

Don't exercise

Exercise stimulates the functioning of the immune system, strengthens the body, refreshes and increases immunity. if don't exercise, your immunity will be weakened.[10]

### 3. CONCLUDE

The change in the body continues with increasing age which is an age that has clearly changed many aspects of external organs such as hair turning gray or white, arched back, wrinkled skin, dry fingernails and toenails. Body system deterioration Easy to cause diseases such as high blood pressure, eye disease, oral disease. According to studies, there are only a few elderly people who have been diagnosed by a doctor and have no health problems.

Senior citizens should always take vitamin E supplements because it has important antioxidant properties that occur in metabolic processes both in the body and from the environment by preventing the oxidation of fat. Prevent free radicals to destroy cells and tissues and the most important function is to be an antioxidant. Help protect cells from being destroyed by free radicals. When metabolism occurs in the body free radicals can cause damage to the cells of the cardiovascular system, brain cells, skin cells. It helps repair the wear and tear of hair, skin and nails, and also inhibits the deterioration of the skin and slows down aging.

Vitamin E can prevent various chronic diseases and also helps strengthen the body's immune system which is found in vegetable fats, legumes, green leafy vegetables, found in cereal oils such as soybean oil, rice bran oil, safflower oil nuts, peanuts and sunflower seeds or animal fats such as cow's milk, human milk, cod liver oil, eggs, liver, meat. It is also found in supplement form.

The elderly should eat properly nutritious food along with exercise, taking care of their physical and mental health. It will help reduce the chance of disease or health problems.

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