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**Ministry of Higher Education & Scientific Research**

**University of AL-Qadisiyah**

**College of Science**

**Department of Chemistry**



# **Studying the Effect of Garlic on Blood Pressure**

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

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## شكرو تقدير

لابد لنا ونحن نخطو خطواتنا الأخيرة في الحياة الجامعية

منو قفة نعود إلأعوام قضيناها في رحاب الجامعة

مع أساتذتنا الكرام الذين قدموا لنا الكثير

بأذلين بذل جهودا كبيرة في بناء جيلنا لعدلتبعث الأمة من جديد

...

وقبل أن نمضي لتقديم أسمايات الشكر والامتنان والتقدير والحمد  
بة

إل الذين حملوا أقدس رسالة في الحياة ...

إل الذين مهدوا لنا طريق العلم والمعرفة ...

إل جميع أساتذتنا الأفاضل .....

"كن عالما .. فإن لم تستطع فكن متعلما،

فإن لم تستطع فأحب العلماء، فإن لم تستطع فلا تبغضهم"

## الاهداء

الى: الذي لولاه لما مسكت اناملي قلماً ... عنوان التفاني والايثار...

ومنبت العز والعنفوان...والذي الحبيب (حفضه الله)...

الى: التي كلما نطقت شفاها كانت بالدعاء لنا...نبع الحنان الصافي ...

ورمز التفاني والضحيه...وعنوان المحبه والاخلاص...والدتي الحنونه...

الى: من أشد بهم أزري... عنوان المحبه ...

أعز ما في الحياة...اخوتي وأصدقائي

الى: الشموع التي انارت طريقي وزينت دربي .....

صانعي الاجيال وبناءة المجتمع ..... اساتذتي الافاضل

اهدي هذا الجهد المتوضع

## **Summary**

**There has been talk about blood pressure in general and the reasons that lead to blood pressure. The pressure was then defined as the force that blood sheds on the walls of the blood vessels. Blood pressure was divided into two types; high blood pressure and hypotensive blood pressure. The reasons for the pressure and how to treat it has been discussed in details. Moreover, the waste resulting from pressure has been also discussed. In this mini review, it has been identified how blood pressure was measured and the device used for this purpose. Interesting relationship has been found between garlic and blood pressure. Therefore, several researchers has been focused on studying the benefit of garlic and they are also discussed its nutritional properties and the nutritional value that it gives to the body. In summary the most benefit of garlic are its potential or its ability to maintain blood pressure.**

## 1.1 Introduction

Hypertension affects 1 billion (one in four) adults worldwide, and attributes to about 40% of cardiovascular-related deaths.<sup>1–3</sup> Standard antihypertensive medication is not always effective, leaving about 24% (3 million) of the adult population uncontrolled hypertensive.<sup>4</sup> Garlic supplements have been associated with a blood pressure (BP)-lowering effect of clinical significance in hypertensive patients.<sup>5–8</sup> The mechanism of action is biologically plausible, whereby garlic's BP-lowering effect involves the hydrogen sulfide- and nitric oxide-signaling pathways.

The causes of disease

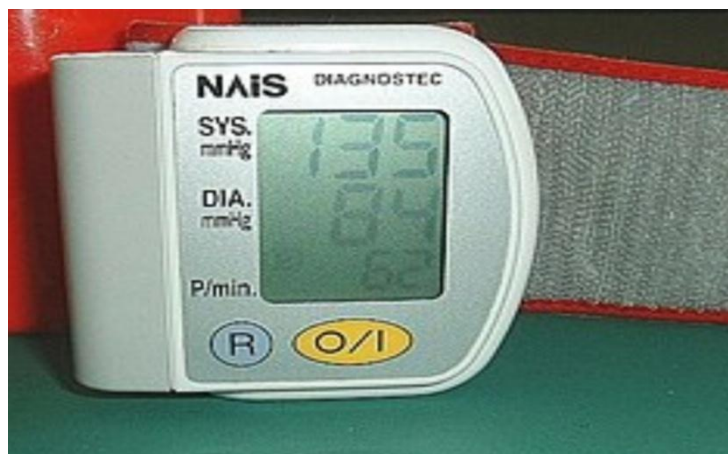
Low blood pressure can be caused by low blood volume, hormonal changes, vasodilation, side effects of medication, anemia, heart problems or endocrine problems. Low blood volume or lack of blood volume is the most common cause of low blood pressure, can result from bleeding, insufficient fluid intake as in starvation, or an increase in fluid loss from diarrhea or vomiting. The lack of blood volume is often caused by the excessive use of diuretics. Low blood pressure can also be attributed to cardiac arrest. The body may have enough fluids but do not retain the electrolytes. [1]

## 1.2 Blood pressure

is the force of blood flow on the walls of blood vessels, through which all the tissues of the body and its organs are transferred to food, oxygen, water and enzymes in the circulatory system. The blood circulation begins with the contraction of the heart muscle to push all its contents of blood, moving from the heart to the aorta, the largest arteries of the human body and from it to the rest of the arteries, and then simplify the heart to allow the filling of a new quantity of blood packed with oxygen to recapture a new impulse a new charge to the aorta once Others, and so forth. Medical statistics show the importance of maintaining blood pressure to an average of 115/75 millimeters of mercury, and that exceeding this limit leads to heart and kidney stress, and may lead to stroke or early infertility in men

Aortic artery is characterized by elasticity. When the blood from the heart is pushed, a strong pressure is placed on the walls of the artery, causing lateral expansion. During cardiac discharge, the artery restores its normal state by squeezing the blood in it, causing it to flow in the rest of the arteries. The blood continues to flow in the arteries during the incontinence. To all members

Blood pressure is called Systolic Pressure. In the case of anastasis, it is called Diastolic Pressure. Systolic pressure is always higher in value than diastolic pressure. When blood pressure is measured, the reading is written as a fracture eg 120/80 where the systolic pressure value is higher The diastolic value is lower. Most blood pressure monitors also record pulse rate, ie heart rate per minute.[2]



**Figure 1:An example of blood pressure monitor**

### **1.3 Measuring of blood pressure**

Blood pressure is measured in a unit called millimeters of mercury in the case of relaxation. The normal measurement of systolic blood pressure for the adult mean life is between 90 and 120 millimeters of mercury. Diastolicity is between 60 and 80 mm Hg. That is, the mean 120 mm Hg and 80 mmHg diastolic



mercury, and read 120/80 mmHg, in what the General 120 calls 80 or 120 mm 80 mmHg. To measure the blood pressure, the electronic device is used in the home or the manual device in the doctor's office and is known as the most accurate pressure measuring gdevice.[3]

## **1.4 Hypertension rate**

A condition that exceeds blood pressure Natural values are known as high pressure - some call it hypertension - but if this rise within the normal values of no more than 140 mmHg is known as high natural; but this situation requires attention because it may indicate that this person An exhibition of high blood pressure in his next years[4]

### **1.4.1 Causes of hypertension**

It should be noted that if there is a reason for high pressure, it is known as secondary hypertension, that is, there is a primary disease resulted in high pressure, such as the patient's cancer of the adrenal gland, which increases the secretion of adrenaline (epinephrine), which in turn leads to high pressure, The reason is unknown, which is often known as high blood pressure initial,

and this is often related to the type of food and increase salt or  
cinnamon or activity[5]

### First blood pressure is reduced

The vast majority of hypertension cases (about 95%) do not have a known cause, and this condition is called primary hypertension or hypertension. Hypertension may start at any age, but usually begins in the middle stage of life [6]

### Secondary hypertension

The rest of the 5% of cases of high blood pressure are attributed to the presence of a medical condition causing, this is called secondary hypertension

### Symptoms of hypertension

1-Chronic chronic headache

2-Red eye and ear

3-Nasal bleeding

It should be noted that not all symptoms are "only" syndrome with high blood pressure, some of them occur as a result of physiological habits, such as fatigue, for example, others are caused by some diseases such as blood liquidity[7]

## 1.5 Pressure drop

Pressure drop, is low blood pressure, especially in blood circulation arteries. Blood pressure is the force of blood pushing against the walls of the arteries when blood is pumped from the heart. There is a general reduction in blood pressure when systolic blood pressure is less than 90 mm Hg (mm Hg) or less than 60 mm Hg. However, in practice blood pressure is very low only if there are noticeable symptoms. Low blood pressure is the opposite of high pressure is better understood as a physiological condition, not as a disease. It is often associated with trauma cases, but not necessarily indicative of them. For some people who exercise and are in high fitness, low blood pressure is a sign of good health and fitness. For many people, excessive hypotension causes dizziness and fainting or refers to serious heart, endocrine or nerve disorders. A severe reduction in blood pressure can deprive the brain and other vital organs of oxygen and nutrients, leading to a life-threatening condition called

shock[8]

## The causes of disease

1-Low blood pressure can be caused by low blood volume, hormonal changes, vasodilation, side effects of medication, anemia, heart problems or endocrine problems

2-Low blood volume or lack of blood volume is the most common cause of low blood pressure, can result from bleeding, insufficient fluid intake as in starvation, or an increase in fluid loss from diarrhea or vomiting.

3-The lack of blood volume is often caused by the excessive use of diuretics. Low blood pressure can also be attributed to cardiac arrest.

4-The body may have enough fluids but do not retain the electrolytes. The absence of sweating, light dizziness and dark-colored urine are also considered to be signs

5-Other drugs can produce low blood pressure through different mechanisms.

7- Chronic use of alpha blockers or beta blockers can lead to low blood pressure.

8-The use of beta blockers can cause both low blood pressure by slowing the heart rate and by reducing the pumping capacity of the heart muscle

9-Low cardiac output Despite normal blood volume, due to acute congestive heart failure, large myocardial infarction, heart valve problems, or a severe reduction of heart rate (slow heart) often results in low blood pressure and can rapidly develop into a cardiac shock .

10 Irregular heartbeat often leads to low blood pressure through this mechanism

11-Some heart diseases can lead to hypotension, including severe heart rate (slow heart rate), heart valve problems, heart attacks and heart failure.

12- These conditions may cause a decrease in blood pressure because they prevent the body from being able to circulate and distribute enough blood[10]

## **the cure**

Treatment for hypotension depends on the cause. Chronic hypertension is generally a symptom of another disease and is rarely considered a disease in itself. Low blood pressure without

symptoms when healthy people do not require any treatment. Cholesterol can be added to the diet to relieve symptoms of moderate hypertension. Also the morning dose of caffeine can also be effective. In light cases when the patient is still responsive, the person is placed in the dorsal position (lying on his back) and lifting the legs up and this leads to increased venous return, so that the blood is more available to sensitive organs such as chest and head[11]

## 1.6 Garlic relationship with blood pressure

Blood pressure is a risk factor for heart disease, which is the leading cause of death in the United States, so garlic is consumed by many people in an attempt to maintain their blood pressure, it is believed that it can help to reduce blood pressure in part, By stimulating the production of nitric oxide (nitric oxide), which plays an important role in the expansion of blood vessels, according to the National Institute of Health (NIH), it is possible that garlic is able to simply reduce blood pressure.[12]

**Table 1: The nutritional value of garlic**

Food Ingredient	Quantity
Calories	149 calories

Water	58.58 ml
Carbohydrates	33.06 grams
The protein is	6.36 grams
Fat	0.50 grams
Fiber	2.1 g
Calcium	181 mg
Iron	1.70 mg
Magnesium is	25 mg
Zinc	1.16 mg
Sodium	17 mg
Vitamin C is	31.2 mg
Vitamin B2	0.110 mg
Vitamin B 6	1.235 mg
Vitamin K is	1.7 micrograms



## Figure 2: Garlic

### 1.7 Health benefits of garlic

**1-Improves cholesterol levels:** Garlic can reduce total cholesterol in the body, and garlic supplements can reduce total cholesterol and LDL cholesterol in those with high cholesterol up to 10-15%. Specifically, it appears that the effect of garlic appears on the harmful cholesterol, but it has no real effect on the good (cholesterol English: HDL) [13]

**2-Reduces the severity of colds:** Garlic supplements enhance the function of the immune system in the body. A large 12-week study found that consuming garlic supplements on a daily basis reduced the incidence of colds by 63% compared to placebo, Colds by 70%, a decrease of 1.5 days in the group consumed garlic, and 5 days in the group that consumed the placebo, and found in another study that eating high doses of garlic extract, equivalent to 2.56 grams per day, reduced the number of days Pathogenic to colds, flu[14]



### 3-Reduces the risk of Alzheimer's disease and dementia:

Oxidative damage from free radicals has been shown to have an effect in aging. Garlic contains antioxidants that support the body's protective mechanism against oxidative damage. High doses of garlic supplements have been shown to increase anti-enzymes To oxidative stress in humans, as well as to reduce oxidative stress in those who suffer from high blood pressure clearly, and can reduce the risk of the incidence of common brain diseases, such as Alzheimer's disease and dementia[15]

**4-Improves bone health:** Some studies have shown that rodents can reduce bone loss by increasing the estrogen hormone in females. However, studies have not controlled any effects of garlic on bone loss on humans, except in one study In menopausal women. The intake of dry garlic extract, equivalent to 2 grams of raw garlic, had a marked effect on their low estrogen deficiency indices, suggesting that garlic supplements .could affect bone health in women [16]

**5-Reduces lung cancer risk:** A 7-year study of people who ate raw garlic twice a week at least showed they were 44 percent less likely to develop lung cancer. Researchers interviewed 1,424 lung cancer patients, 4543 healthy people, They were

asked about the nature of the diet and their lifestyle, including smoking, and their consumption of garlic. It was observed that there was a protective effect associated with ingestion of raw garlic and lung cancer, indicating that garlic may have a chemical protective agent for lung cancer[17]

## 1.8 Ingredients of garlic

Garlic consists of a number of compounds, fibers, proteins and vitamins, but the main compounds are soft, lignase, alesin, cododenine and selenium, and contains every 100 grams of garlic on the nutritional value as follows: [18]

- 1- Carbohydrates account for 33.06 grams
- 2- The sugar content does not exceed 1 gram
- 3- Garlic contains dietary fibers estimated at 2.1 grams
- 4- Protein enters its composition by 6.36 grams
- 5- Do not exceed 0.5 g fat
- 6- Contains vitamins A, B, C, E
- 7- It consists of a percentage of mineral salts, yeast and anti-rot

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