

Garlic effects on polycystic kidney disease

Abstract

Garlic, a root vegetable, which is characterized as herb and spine [2], has many amazing properties. This amazing herb can help body to reduce high blood pressure and cholesterol levels, boost immune system and it can decrease the risk of getting cancer. But is it useful for PKD patients? The answer is yes. Although it has been mysterious for years how to treat polycystic kidney disease, but it is found that by controlling high blood pressure, high amount of cholesterol, and also managing the symptoms we can slow down the arriving to the last stage which is dialysis. Directly its connection with high blood pressure and high cholesterol is effective on kidneys, researches showed that allicin in garlic can help to decrease high blood pressure and high cholesterol. In addition, this wonderful herb can help kidneys to work better. Due to the fact that in PKD, kidneys lose their proper function, it would be a supportive way to consume garlic, because of garlic's diuretic properties and detoxing blood.

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Introduction

Garlic or *Allium sativum* is a member of Amaryllidaceae or onion family [43]. It has wide values and benefits in medicine that makes it a valuable plant in ancient times. Due to this fact researches showed that allicin in garlic has the main role in garlic's properties, which can decrease high blood pressure and high cholesterol level.

Normally, it's kidney duty to clarify the blood and get rid of waste and toxic substances from the blood, but sadly in pkd or Polycystic kidney disease patients' kidneys fail to filter out these toxic substances from blood. [28]

A question will appear in this situation, is garlic useful for polycystic kidneys? Can we use it as cure for patients? Unfortunately, the connection of garlic with kidney diseases such as a polycystic kidney disease is still not been studied, yet no one discussed that.

This wonderful herb, garlic can help these patients indirectly and directly, in this essay I'm going to explain its connection with PKD.

Garlic:

Garlic an amazing herb with astonishing properties.

This root vegetable is called *Allium sativum* specifically. It is from Amaryllidaceae family, which is the same as onion family. [2]

it is made of approximately 65% water, 28% carbohydrate, 2.3% organosulfur compounds, 2% protein alliin, 1.2% amino acids, and 1.5% fiber. [44]

Garlic contains high level of potassium, phosphorus zinc, sulfur, selenium, calcium, magnesium, manganese, iron, sodium, also it includes vitamin A, C, B complex. [3]

Alliin is the main bioactive compound present in raw garlic and less in in cooked one. [4]

When we chop or grind garlic, allinase enzyme is activated and produce allicin from alliin. [5]

This amazing herb is used for curing cold and decreasing the risk of cancer and also for lowering the blood pressure and cholesterol levels. In ancient times garlic was used in many conditions and for curing various diseases, such as reducing

depression, gaining strength, getting rid of intestinal worms, for intestinal and stomach problems,

recovery in animal bite wounds and protection from diseases.

This wonderful herb was quite famous in ancient Greece and ancient Egypt. [43]

Besides its curing properties, it is well used in food and cooking, which makes a delicious base in each dish because of its flavor and smell.

PKD

Polycystic kidney disease is an inherited disease that makes multiple cysts in kidney. This disease is inherited from parents to their children by genes. [6]

This disease has two types, it can be inherited as an Autosomal Dominant (ADPKD) or an Autosomal recessive (ARPKD) trait. [7]

The cysts in this disease are in various sizes and shapes mostly in round shapes and also in oval shapes, causing kidneys to enlarge and lose its function over time.

These cysts contain fluid in themselves. This fluid is serous fluid or blood. They can have a single layer of cuboidal or flattened epithelial. [8]

The most common sign in this disease is pain in the abdomen or back, which is mostly caused by enlargement of one or more kidney cysts. [9] for mentioning the other symptoms we can mention

high blood pressure, blood in urine, feeling fullness in your abdomen, growth in abdomen due to the growth of kidney, and Headaches. [10]

This disease has some complications, such as: high blood pressure, loss of kidney function, chronic pain, growth of cysts in the liver, development of an aneurysm in brain, pregnancy problems, heart valve abnormalities, colon problems.

Unfortunately for this disease there is no cure yet [11], and it is only controlled and slowed the speed of losing the kidney's function. One way to control the further damages to the kidneys is treating and controlling high blood pressure.[11]

Untreated high blood pressure can damage the kidney by bursting the cysts .[13][12]

The connection of garlic and PKD:

PKD can cause serious complications, among these complications we can mention high blood pressure, which is really common . [10]

Hypertension or high blood pressure, affect around 60 to 70 percent of patients and also in many cases high blood pressure is the first symptom of PKD.[18] One of the best way to prevent the kidney failure is to control your blood pressure. [10]

The main active compound in garlic is alliin, it is made, when garlic is chopped or smashed, from alliin. In fact, an enzymatic reaction happens, in this enzymatic reaction alliin reacts with alliinase(the enzyme) and allicin is formed.[14]

This amazing compound is known for its effect on high blood pressure. Allicin prevents angiotensin production, which is responsible for contracting the blood vessels, so in this case the blood pressure will decrease.[15] evidence in a research showed that consuming garlic can reduce blood pressure by 8- 10mmhg.[17]

It is said that using up to 2 cloves or 4 grams of fresh garlic daily can reduce high blood pressure. It is recommended to consume garlic when you're not full, because the nutrients can be absorbed ways better. [16]

The connection of high cholesterol and PKD directly:

The other factor that can affect PKD directly is high cholesterol.

Cholesterol is a substance, which is fat like in blood vessels. [20]

High amount of cholesterol can deposit in arteries and this can increase the risk of heart attack beside this fact it was showed that high level of cholesterol is not good for kidneys either. [19]

The high amount of cholesterol can build up in the blood vessels supplying your kidneys, so this makes difficult for kidneys to work properly. This causes the kidneys to put pressure on themselves to filter

the blood, and makes the kidney disease to worsen, so it is recommended to these patients consume less cholesterol, and in some cases, cholesterol

control pills are prescribed for these patients. [19]

Beside causing heart illnesses, such as heart attack and strokes, high cholesterol level can block the renal arteries and disconnect and disrupt blood flow to the kidneys and leads to kidney failure. [21]

Some suggestions proved that consuming garlic can decrease the amount of cholesterol in the blood.[22]

Evidence showed that consuming Garlic daily can reduce cholesterol about 9%, which can be helpful and supportive the standard treatments.[22]

It causes a decrease in absorption of cholesterol by having active substance allicin [23] ,so, it helps the patients' kidneys to reduce the pressure on themselves while they are clarifying the blood.

It is shown that consuming one clove or 6 g of garlic two times, for 8 weeks can improve the level of cholesterol. Approximately using a certain dose of garlic for 4-12 weeks needs to reach the lower level of cholesterol.[25]

The connection high cholesterol and PKD indirectly:

One of the reasons of the warning signs of high cholesterol is high blood pressure. [27]

By having high cholesterol in blood, body can't clear the cholesterol plaque from artery walls and it deposits, so the arteries become narrow and

tightened. In this case heart needs to pump blood harder and with higher pressure. As a result, the blood pressure will increase. [26]

As we know having high blood pressure in PKD patients, needs to be under control, so in some cases doctors prescribe drugs to lower the level of cholesterol in patients. Although there is a supportive way to reduce the level of cholesterol in body, some suggestions proved that consuming garlic can decrease the amount of cholesterol in the blood by the active substance allicin [23], so in this case by controlling the level of cholesterol we can control blood pressure, in conclusion, it helps patients' kidneys to reduce the pressure on themselves.

Anti-inflammatory effects of garlic on PKD:

Inflammation is the immune system's natural response to damaged cells, or toxic compounds and even substances such as, viruses, germs and

bacteria. Body, during Inflammation, reacts by trying to clean the area from harmful substances or healing the damaged tissue, by using chemicals that

can cause redness and pain. Common symptoms of inflammation are redness, pain, swelling, heat and loss of function of the injured part.[29]

PKD is among the largest causes of kidney failure. Interstitial Inflammation is a common component of chronic kidney disease (CKD), also it is better foretold way compared to glomerular health, for advancement of kidney disease. There is no exception in this situation for polycystic kidney disease (PKD). Signs of inflammation occur sooner compare to perceptible cysts. In PKD inflammation and cyst progression are connected. [31]

When a cyst bursts in kidney, patients will face a sudden beginning pain, in which it is due to

increase in cyst size with distention of kidney capsule. [32] [33] In some cases a burst cyst can cause blood in the urine or block urine flow, and all can cause kidney swelling. [34]

Garlic has Anti-inflammatory advantages, by sulfur base compound or allicin. Allicin is a compound that can be an anti-inflammatory.[35] it prevent the increase in expression of proinflammatory cytokines IL-6 and MCP-1. [36]

Also garlic has diuretic effect[.]. This property can reduce blood pressure and cure inflammation. []

In conclusion it can be mentioned that using garlic in a controlled way may help to reduce the inflammation and swelling in the kidneys, which is caused by the many cysts in kidney.

Garlic cleans the blood:

Raw garlic is one of the best herbs on the Planet earth. Allicin a sulfur containing substance, that activated in garlic when garlic is chopped or smashed. [37] This organo- sulfur compound plays the role of detoxifying in garlic, they rise the number of detoxification enzymes and also improve levels of glutathione and sulfur so that can help the enzyme to work ways better. [38]

Kidneys, two small organs located below the rib cage on each side of spine, works as filter for body. They detox blood from waste, extra fluid and chemical substances. [39] [40]

So, it can be mentioned that consuming garlic is one of the useful ways for cleaning blood and especially in PKD, that patients' kidneys loss their normal functions, it can support kidneys to work better.

Conclusion:

PKD, a disease in which patients suffer from the loss of kidney function and also some complications, such as high blood pressure and high cholesterol. Although sadly there is no cure for these patients, there are some ways to control and delay the final stage (dialysis), which are controlling high blood pressure and the level of cholesterol, and also other complications like inflammation.

Garlic or *Allium sativum* is one of the oldest plants in the world (29). This amazing plant was used for curing various diseases in ancient times, and nowadays it is still famous in medicine. By using raw garlic in certain ways with known amounts we can support the standard treatments in PKD. Garlic by having amazing properties can reduce high blood pressure and the level of cholesterol, it can decrease inflammation which is caused in kidneys, and it can detoxify the blood from wastes and help kidney's function. Hope to find a cure for this disease.

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