

Diagnosis and treatment of gouty nephropathy

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Abstract: Gout is a crystal-associated arthropathy caused by monosodium urate (MSU) deposition, and gouty nephropathy is a chronic renal injury disease that occurs as a result of prolonged hyperuricemia leading to the deposition of uric acid and urate in the renal tubular mesenchyme as well as renal vascular lesions. Chinese medicine categorizes gout within the scope of paralysis or calendar joint disease from the etiology and clinical manifestations. In this article, we will review the understanding of gouty nephropathy, etiology, clinical manifestations, diagnosis and treatment, prognosis and outlook.

Keywords: Evidence-based treatment; gout; gouty nephropathy

1. Preface

With the rapid development of modern economic and cultural life, people's living standard has made a great leap compared with the past, clothing, food, housing and transportation have undergone great changes, in which the changes in the dietary structure also caused some problems that need to be paid attention to and concern. In recent years, the incidence of gout has increased dramatically, and at the same time, it also triggered kidney disease, endocrine disease and cardiovascular disease, these phenomena have seriously affected people's work and life. At present, the combination of Chinese and Western medicine to treat this disease has received more attention, and the efficacy of Chinese medicine on this disease has been widely recognized.

2. Understanding of gouty nephropathy

Gout is a disease in which uric acid is too high in the body and then deposited in the joints and tissues of the body, leading to multiple damages. The causes of gouty nephropathy are closely related to individual's physical condition and lifestyle habits. First of all, in terms of gender, the incidence of gout in adult men is much higher than that in adult women. According to statistics, the incidence ratio of men and women is 9:1 [1], as shown in Figure 1. One of the reasons is that most men like to drink beer and eat high purine food. Secondly, in terms of geographical environment, the incidence rate of gout in coastal areas is higher than that in mainland areas. People living in coastal areas prefer to consume seafood, which is also an important cause of hyperuricemia. Patients with gouty nephropathy will not only suffer from the pain caused by the primary disease, but also suffer from the pain caused by various complications during the development of the disease. Prolonged hyperuricemia will lead to multiple systemic complications, such as renal impairment, diabetes mellitus, hypertension, hyperlipidemia, and heart disease [2]. These complications will seriously affect the normal life and work of patients, and patients with serious conditions may even have limitation of limb movement. The causes of gouty nephropathy are roughly divided into two, the first is the excessive production of blood uric acid, and the second is the reduction of uric acid excretion, resulting in the formation of hyperuricemia, the long-term development of the condition, which ultimately led to the damage of renal function. The clinical manifestations of gouty nephropathy mainly include uric acid stones, proteinuria, edema, nocturia, hypertension, elevated blood uric acid and renal tubular function damage, as shown in Figure 2. If gouty nephropathy can get standardized treatment and care in the early stage, it can effectively reduce the renal function damage of patients, so as to effectively control the disease progression and improve the quality of life of patients. Therefore, the treatment of gouty nephropathy should advocate early detection, early diagnosis and early treatment.

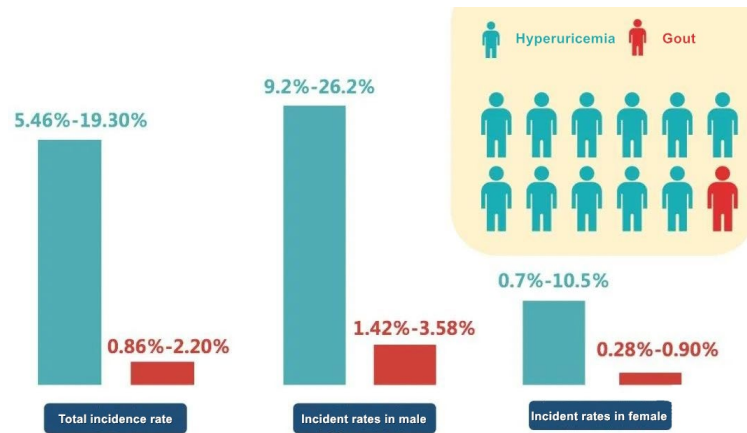


Figure 1: Incidence rate of gout

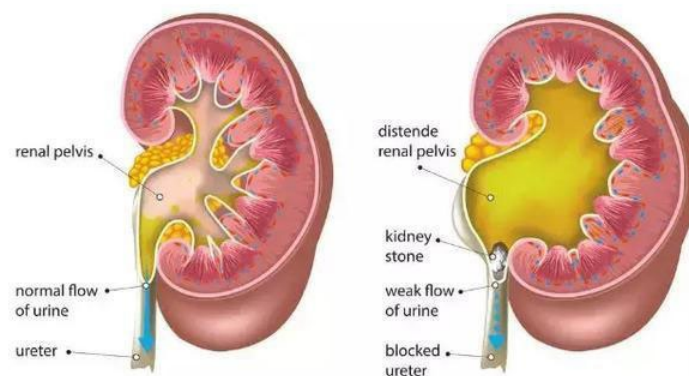


Figure 2: Uric acid salts deposit in the kidneys to form uric acid kidney stones

3. Etiology of gouty nephropathy

Gouty nephropathy does not have a precise name in Chinese medicine, but high uric acid and gout are relatively old diseases. According to the motherland medicine, the causes of gout are mainly internal and external factors, the internal factors mainly include dietary habits, emotions, exertion and other factors, and the external factors mainly include heat and dampness and other factors. These factors lead to problems in the body's internal digestive and metabolic systems, resulting in redness, swelling, heat and pain in the joints and mobility problems. Throughout the history of Chinese medicine, various medical doctors have had different opinions on the causes of gout, but to summarize, there are two main schools of thought: deficiency of the liver and kidneys and deficiency of the spleen and kidneys. Prolonged deficiency of the liver and kidneys leads to qi deficiency, and deficiency of the spleen and kidneys leads to blood stasis, dysfunctional transportation and internal dampness, and dampness and stasis intertwine with each other, blocking the meridians and channels, leading to unfavorable meridians and local pain. Therefore, in general, dampness-heat, blood stasis, phlegm stasis are the key reasons for the development of gout.

3.1. Influence of physical factors on the development of gouty nephropathy

Chinese medicine emphasizes that "treating the disease according to the individual's needs" is the embodiment of constitution in clinical application. As we all know, everyone's constitution is different. The influence of constitution on gout is not only reflected in the stage of onset, but also affects the treatment, prognosis and care of the disease. Physical strength is a determining factor in the onset of the disease, however, people with strong physiques do much better than those with weak physiques in the later stages of the disease in terms of treatment and regression. In short, the prognosis is better for those with a strong constitution and worse for those with a weak constitution.

3.2. Influence of genetic factors on the development of gouty nephropathy

According to research, there is a certain family genetic tendency for gouty nephropathy. This genetic feature tends to be more prominent among males² in the family. Simply put, if the father suffers from gout or gouty nephropathy, the chances of the child developing gout and gouty nephropathy later in life will be a bit higher.

3.3. Influence of dietary factors on the development of gouty nephropathy

It is well known that dietary structure is a crucial reason for the development of gouty nephropathy. Some data show that people who love to consume high purine food in daily life are much more likely to suffer from gout and gouty nephropathy than those who do not love to eat high purine food.

4. Clinical manifestations of gouty nephropathy

(1) Chronic gouty nephropathy is often easy to be ignored because of its insidious onset, and some of them may have symptoms such as proteinuria, hematuria, hypertension, etc. If the development of the disease is not well controlled in the early stage, the symptoms of polydrinking, polyuria, and increased nocturia will appear in the middle and late stages, and with the development of the disease, it will even develop into renal failure and uremia, which is very harmful. Clinically, early proteinuria and hematuria are relatively insidious manifestations that are hard to detect without examination. The easiest to detect is the complication of hypertension. As the manifestation of hypertension is something that the patients themselves can feel, such as dizziness and pain symptoms, the first thing that comes to people's mind is elevated blood pressure. It is reasonable to realize that high blood pressure is recognized as one of the most serious complications, with adverse consequences such as strokes and hemiplegia of the limbs. In the event of severe hypertension, it is important to apply blood pressure lowering medications to keep the blood pressure values within safe limits. The main pathological changes caused by gouty nephropathy are interstitial changes that directly affect the glomerular filtration rate, resulting in acute or chronic renal insufficiency.

(2) Acute gouty nephropathy manifests as a sudden decrease in urine output and a decline in renal function within a short period of time, which is due to the rapid increase in uric acid deposition in the body in the collecting ducts, renal pelvis, and ureter thus causing obstruction. According to research, about 20% of patients with gouty nephropathy have urinary stones.

(3) According to research, about 20% of patients with gouty nephropathy also suffer from urinary stones, which are basically formed by uric acid crystals. Gouty nephropathy belongs to the middle or late stage of the development of gouty diseases, the urate crystals in the body have been relatively more, for example, the human body's hands, elbows, knees and feet joints, etc. , there will be deposits of large and small uric acid stones.

(4) If the patient's condition is not well controlled during the development of gouty nephropathy, the disease will often be accompanied by other systemic complications when the disease develops to the middle and late stages. In recent years, these complications have become a new and more serious threat to patients' lives. Based on this phenomenon, while treating gouty nephropathy for patients, doctors must regularly check the health status of other systems. In this way, we can have a comprehensive and detailed understanding of the condition and treat the disease better. (Figure 3)

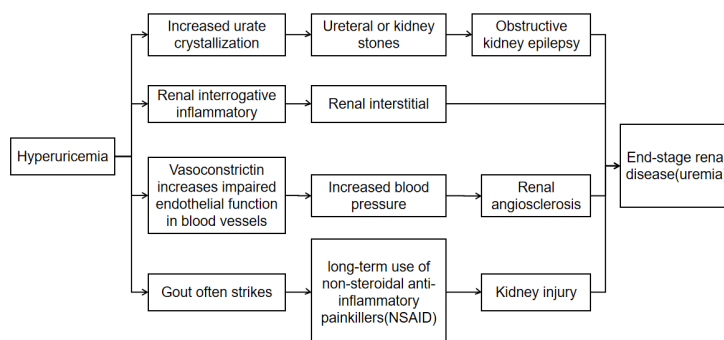


Figure 3: Mechanism of end-stage renal disease

5. Diagnosis and treatment of gouty nephropathy

5.1. Modern medical treatment of gouty nephropathy

The treatment of gouty nephropathy from the perspective of Western medicine is mainly divided into two stages: the acute stage and the remission stage. The main principle of the acute stage is pain relief, and drugs such as colchicine are commonly used in clinical practice [3]. The main principle of the remission period is to lower uric acid and protect renal function, when there is a mild renal function damage, the general use of drugs to promote uric acid excretion, when there is a moderate renal function damage at the same time to promote uric acid excretion and inhibit uric acid production of drugs. Clinically, it is common to use drugs to promote uric acid excretion, such as benzbromarone, and common to use drugs to inhibit uric acid production, such as allopurinol. When severe renal impairment occurs, renal replacement therapy can be taken. Renal replacement therapy can relieve the burden on the kidneys and alleviate the pain of patients. At present, renal replacement therapy is a very mature treatment technology at home and abroad, and has been widely used in clinical treatment to relieve the pain for more and more patients, and to a certain extent, improve the quality of survival of patients with advanced kidney disease. However, it is not easy for patients to fully accept renal replacement therapy psychologically. For the patient group with relative lack of medical knowledge, it is only when the condition is very serious that renal replacement therapy Chinese therapeutic techniques will be used, so almost every patient needs a long process to accept this fact.

5.2. Chinese medicine's diagnosis and treatment of gouty nephropathy

Chinese medicine believes that the causative factor of gouty nephropathy is mainly the accumulation of dampness and heat in the human body, and the blood in the joints does not run smoothly, resulting in swelling and pain in the joints, which affects the normal life due to mobility problems. In the process of treating the disease, Chinese medicine attaches importance to the differences between individuals, in short, although it is the same disease, but different people show different symptoms, in other words, in the face of this situation, the treatment of the disease should be more observation, more thinking, and grasp the subtle differences can be accurate dialectical treatment of the disease. Chinese medicine divides gouty nephropathy into the following conditions for treatment, first of all, dampness-heat mutual conjunction evidence, gout is mostly of this type in the acute stage, most of them are induced by dietary problems, and in this period, there are usually severe pains in one or more small joints, which affects the normal activities, thirst, reduced urination, and constipation. Chinese medicine treatment is: clearing heat and removing dampness to relieve pain. The composition of medicines often used in TCM is: bamboo leaves, gypsum, Pinellia termata, bark of himalayan coralbean, coix seed, jujube, licorice and so on. Clinically, it needs to be chosen according to the patient's specific condition. Secondly, phlegm stasis paralysis, this type of gout for a long time, a long time can not be cured belongs to this type, can appear in the joints swollen and deformed, the place of the pain is fixed and the skin color is mostly greenish-purple. Chinese medicine treatment is to activate blood circulation and eliminate blood stasis, and to eliminate phlegm and clear the channels. The medicines often used in TCM are: peach kernel, safflower, angelica, red peony, Poria cocos, Pinellia termata, coix seed and so on. Finally, there is deficiency of the liver and kidney. Patients who have a long course of disease and are older are mostly suffering from deficiency of the liver and kidney, which may cause pain in the waist and knees, joint pain and unfavorable flexion and extension, and even numbness of the skin, dizziness and tinnitus. Chinese medicine treatment is: tonifying the liver and kidney, opening the collaterals and relieving pain. Traditional Chinese medicine often uses the composition of the medicine is: radix angelicae tuhuo, giant knot weed, parasitic loranthus, asarum, Angelica sinensis, Cassia twig and so on. At present, renal replacement therapy is a very mature treatment technology at home and abroad, and has been widely used in clinical treatment to relieve the pain for more and more patients, and to a certain extent, improve the quality of survival of patients with advanced kidney disease. However, it is not easy for patients to fully accept renal replacement therapy psychologically. For the patient group with relative lack of medical knowledge, it is only when the condition is very serious that renal replacement therapy Chinese therapeutic techniques will be used, so almost every patient needs a long process to accept this fact.

6. Other therapies for gouty nephropathy

Gout and gouty nephropathy patients are usually seen in obese people, these people in their daily

life tend to like to eat high purine and high calorie food, so for gout patients first of all, strict dietary control, reduce the intake of purine, as shown in Table 1. Clinically, low purine diet is widely recommended for gout patients, and there are many low purine foods, such as: rice, cucumber, fish and so on. Next is to quit drinking, especially should strictly prohibit drinking beer. Gout attack period most people will appear local joints red, swollen and hot pain symptoms, joints severe pain intolerable, relieve these symptoms can also be used some physical therapy, such as cold compresses on the affected area, but also can be used some traditional Chinese medicine, the patient's painful parts of the acupuncture treatment, acupuncture treatment is fast; in addition to acupuncture treatment, you can also be in the affected area of the external application of symptomatic treatment of the ointment, the advantage of this method is non-invasive and convenience^[4]. In recent years, with the diverse changes in lifestyle, a variety of medicinal and food-based health drinks have been developed on the market, which have the effects of lowering blood lipids, lowering blood pressure, lowering uric acid, etc. Among the uric acid-lowering drinks, there is a wide range of medicinal and food-based drinks, which have the effects of lowering blood lipids and blood pressure. Among them, the drinks for lowering uric acid are usually added with Chinese medicines with corresponding effects, such as psyllium^[5]. Although these drinks have limited efficacy, they are very popular with the majority of patients. From the above treatment methods, it can be seen that Chinese medicine is not only concerned about treating diseases, but also committed to caring for and relieving patients' anxiety and negative emotions due to illness, which is an important reason why Chinese medicine is more and more trusted and liked by the society.

Table 1: Dietary recommendations for Gout patients

Diet Advice	Content
Prohibition of intake	Animal offal
	Seafood
	Thick broth and gravy
	Wine(for acute attacks and chronic gout stones)
Restriction of intake	Red meat
	Fish
	Foods containing fructose and sucrose
	Alcohol(especially beer and spirits),total alcohol <28g/day for men and 14g/day for women
Encourage intake	Skim or low-fat dairy products(300ml/day)
	1 egg/day
	Fresh vegetables 500g/day
	Low glycemic index cereals(whole grain,legumes)

7. Prognosis of gouty nephropathy

Gouty nephropathy is a chronic state of high uric acid in the human body, resulting in varying degrees of renal impairment. More and more doctors support the idea that gout should be detected and diagnosed at an early stage when it occurs, as well as intervened and treated as early as possible in a correct and standardized manner. The prognosis of gouty nephropathy is closely related to a number of factors. Firstly, it has to do with the patient's medical adherence, the doctor has formulated an authoritative treatment plan, if the patient can't cooperate well, it will delay the condition and eventually lead to the deterioration of the condition; secondly, it has to do with the patient's physical fitness, so it is not indispensable to carry out appropriate physical exercise in daily life. Finally, it is related to whether patients can adhere to regular diet control, as we all know, the onset of gouty nephropathy has a very close relationship with people's dietary habits, for gout and gouty nephropathy patients, it is very important to cultivate a scientific low purine diet recipes. All three factors are crucial to the prognosis of gouty nephropathy. At present, the cooperation of multiple treatments is a big trend, such as the combination of Chinese and Western medicine, and the combination of internal and external treatments of traditional Chinese medicine, which all have better efficacy^[6]. For patients with gouty nephropathy, reviewing renal function on time is also an important basis to facilitate timely understanding of the condition and adjusting the treatment program. Although the prognosis of this disease is generally good, but it is worth noting that the disease is extremely easy to recur, after the disappearance of symptoms in the treatment process, physical and chemical indicators to reach the standard, but still need to improve the awareness of the prevention and treatment of gout and gouty

nephropathy, and long-term adherence to a healthy diet, so as to effectively reduce the probability of the recurrence of gout and gouty nephropathy [7].

8. Conclusion

Currently the incidence of gout is increasing and the consequence is that more and more people suffer from gouty nephropathy. However, both gout and gouty nephropathy are preventable and controllable diseases. With the development of all aspects of society, the purpose of Chinese medicine treatment of gouty nephropathy is not only to treat the disease and eliminate the pain, but also to care for the negative emotions brought by the disease to the patients. At present, on the basis of conventional treatment, in addition to focusing on the reduction of drug toxicity, Chinese medicine treatment of gouty nephropathy also attaches importance to the activation of blood circulation and elimination of blood stasis, clearing dampness and heat, tonifying the liver and kidney, etc. , which has produced a clinical therapeutic effect that has been widely recognized. It is worthwhile to learn in depth that the efficacy of the combination of Chinese and Western medicine for gouty nephropathy is even more evident to all walks of life. It is hoped that in the process of treating the disease in the future, more and more people will realize that sometimes prevention of the disease is also indispensable.

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