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## GOUT - SYMPTOMS, RISK FACTORS, STAGES, DIAGNOSIS, TREATMENT, PREVENTION

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### Annotation

Gout is a disease of the joints, the etiology of which is a metabolic disorder, imbalance in the metabolism of purine compounds and the accumulation of uric acid in the body. The first scientific description of the symptoms of chronic gout dates back to 1865. Sindegam Thomas, who has suffered from this disease for 30 years, writes a book called *The Laws of Gout*, which details what gout is, the clinical signs of the chronic stage of gout, and the description of acute gout.

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Gout usually affects adults. According to statistics, 0.1% of adults on the planet suffer from gout, and in developed countries (Western Europe, USA) the number of people suffering from gout is close to 2%. However, experts believe that the true picture of the disease differs from the statistics, because the late diagnosis of patients complicates the study of statistics.

Researchers also point out that gout, which until the twentieth century was considered a male-only disease with some exceptions, can now be observed in both sexes. But the ratio of sick men to women is still not the same: 1 female patient for every 20 male patients. The reason for the increase in the diagnosis of gout in women is the improvement in quality of life. The increase in purine-rich food expectations and the increase in alcohol consumption among the general population are also having an impact.

There is also a "rejuvenation" of the diagnosis of gout: if the disease previously occurred in men aged 35-45 years, now the limit is 30 years.

### GOUT IN MEN

Gout is more common in men than in women due to two factors:

- Partial heredity of the disease, which is passed from generation to generation through the X chromosome, and in men there are no other variants due to the fact that this chromosome is single (XY);
- Malnutrition and alcohol consumption that are common for men.

A characteristic feature of gout in men is that members of this sex go to the doctor during acute attacks of gout or when the appearance of external signs of the disease - the deformation of the joints and the formation of tophi.

#### Characteristics of gout in women

In women, menopause is characterized by an increase in the level of uric acid in the soft tissues and the accumulation of urate and salt crystals. The risk of gout is significantly increased during this period, especially if there is a genetic predisposition, so gout in women is most often diagnosed between the ages of 50-55.

However, female genetic predisposition is only likely to be different from that of males. The gene responsible for the production of enzymes necessary for the metabolism of purine compounds is located on the X chromosome, and there are two such chromosomes in women (XX). Therefore, if one gene on a chromosome is damaged, its function is offset by the intense activity of a gene on another chromosome. If both genes are affected, the risk of developing gout in women is the same as in men (almost 100%), and the age of onset of the disease is significantly reduced.

#### Causes of development of gout

The only reason for the development of gout is a steady increase in uric acid in the blood, which leads to the formation and accumulation of salt crystals in the soft tissues of the body. The initial stage of hyperuricemia, i.e. an increase in uric acid levels, does not lead to the formation and accumulation of salt crystals, but indicates a serious metabolic disorder, which is the first sign of the disease.

Several factors may contribute to the increase in uric acid concentration. The main ones are hereditary predisposition, the ingestion of large amounts of purine compounds in the body through food, increased purine catabolism (breakdown), as well as slowing down the process of excretion of uric acid through dysfunctional or age-related urine.

**Speed of synthesis of purin nucleotides as a good developing factor** The breakdown of purine bases, which leads to the formation of uric acid, usually proceeds at a constant rate, the rate of which is determined by the amount of enzyme. When there is an increase in the amount of purine in the body for various reasons, the rate of synthesis increases and the amount of uric acid in the blood increases. This process can be temporary and reversible in nature, or it can take a long time due to chronic diseases, instability of the diet. Prolonged use of cytostatics, radiotherapy and chemotherapy, hemolysis, and some types of surgery can also increase the synthesis of nucleic bases.

#### Rate of urinary acid release

Gout as a secondary disease develops against the background of impaired renal function. After processing and filtration in the renal tubules, uric acid is usually excreted from the body along with urine. In chronic kidney disease, the function of excretion of products formed during the breakdown of purine bases may be impaired, leading to an increase in the amount of uric acid in the blood.

The main factors that prevent the excretion of uric acid are partial or complete closure of the renal tubules due to inflammation or growth of connective tissue.

#### Overword purins

Excessive consumption of spontaneously purine-rich foods does not lead to the development of gout, which creates optimal conditions for the development of the disease when the purine processing function or the process of excretion of its products is impaired. A special diet is considered part of the treatment of gout and as a measure to prevent its development or exacerbation, especially in the presence of genetic predisposition or other risk factors.

## Genetic prediction as a cause of gout

The enzymes involved in the processing of purines, a group of proteins, are synthesized in humans due to the presence of certain genes. In enzymopathy, the body is unable to produce the required amount of enzymes to support the synthesis process and process various compounds. When there is a lack of a specific protein that regulates the processing of purines and the excretion of uric acid from the body, the concentration of toxic compounds in the blood increases and leads to the development of gout. The disease is passed on from parent to child.

Enzyme deficiency, which is a contributing factor to gout, is a common genetic metabolic syndrome that can lead to overweight, diabetes, hypertension, and hyperlipidemia.

## Symptoms of gout, stages of development and diseases

As a rule, this disease is characterized by a clear clinical picture, marked symptoms and successive stages of development. However, in some cases, the symptoms are not clear enough or are hidden behind the symptoms of other diseases.

The correct diagnosis can only be made by a specialist and should be made as soon as the first symptoms of gout appear. If left untreated, if there are no dietary restrictions, if the diagnosis is delayed, pain attacks are more frequent, inflammation increases, joints become deformed, the development of urinary tract diseases, systemic injuries, deterioration of health, creating conditions for the patient to become disabled.

## Stages of gout

The stages of gout are divided according to the following indicators:

- Clinical picture specific to certain stages of the disease;
- Uric acid level in the blood;
- Presence of solid urates, crystalline compounds.

Based on this information, one of the three stages of gout can be distinguished:

- The initial premorbid stage is characterized by hyperuricemia, which is detected by biochemical analysis of blood. There are no signs of damage to the joints and urinary system, but there may be non-specific symptoms: weight gain, digestive disorders (frequent constipation, difficulty in defecation), itchy skin, etc.;
- Intermittent or intermediate stage - the formation of salt crystals in the tissues around the joint, and rarely in the kidney tissue. This stage is characterized by the onset of pain, acute inflammation of the joints, gout attacks. The acute pain disappears on its own and remission (interim improvement period) begins, with attacks lasting 3-7 days. Outbreaks appear to be exacerbated by dehydration, alcohol consumption, malnutrition, starvation, chills, acute infections, and surgical interventions;
- The chronic phase of gout is followed by alternating periods of seizures and remission. This stage is characterized by the formation of interval tofus and the accumulation of small salt crystals. Depending on the severity of the disease, the size of the tofus can be significant and can cause pain. This stage also includes redness of the skin in the area of the injured joint, impaired joint mobility, hyperthermia, and inflammation of local tissues. In the chronic stage of gout, urinary tract disease often develops.

## Gout prevention

Prevention of gout is especially important for people who have a predisposition or hereditary risk for the onset and development of the disease. Primary gout develops against the background of an increase in the concentration of purine bases in the blood, so adherence to dietary restrictions is considered not

only a treatment but also a preventive measure.

A healthy lifestyle and regular check-ups are also good ways to prevent gout. Risk factors that contribute to the development of gout include constant starvation (albeit for weight loss or recovery), rapid weight loss, taking certain medications (cytostatics, diuretics of any form [tablets, o' tlar, teas]), drinking too much alcohol, injuries, depression, infectious diseases, and more. Even when a diagnosis is made, these preventative measures can alleviate the disease, slow or stop its progression, and improve the overall condition.

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