

Gout: No Longer the Disease of Kings

Key Messages

- ※ Gout is caused by sustained hyperuricaemia (i.e. increased uric acid levels in blood). In western developed countries, gout is the most prevalent inflammatory arthritis.
- ※ In Hong Kong, prevalence of gout rose continuously over the past decade. In 2016, the crude prevalence of gout was 2.9% which was similar to the rates in Western developed countries.
- ※ There is no cure for gout yet. Prevention of gout attacks can be achieved through leading a healthy lifestyle that helps keep uric acids in the blood at optimal levels, including:
 - Eat a balanced diet and limit the intake of high purine foods;
 - Avoid alcoholic beverages and sugar-sweetened drinks high in fructose;
 - Stay well-hydrated and plain water is the best;
 - Maintain an optimal weight;
 - Be physically active; and
 - Take medications as prescribed by the doctor.
- ※ In 2018, the Hong Kong SAR Government launched “Towards 2025: Strategy and Action Plan to Prevent and Control Non-communicable Diseases in Hong Kong” (SAP). Of the 9 local targets to be achieved by 2025, many are related to the prevention and control of gout and its complications, including Target 2: To reduce the prevalence of alcohol drinking among adolescents and adults, and Target 7: To halt the rise in obesity (and diabetes).
- ※ The Government will step up efforts in promoting healthy diet and physical activity participation, enhancing public awareness about the importance of primary disease prevention, as well as working with the community in building a health-enhancing environment.

Gout : No Longer the Disease of Kings

Gout is one of the oldest joint diseases known to humans, first identified by the Egyptians as far back as 2640 BC.¹ Gout is once described as “a disease of kings”, typically afflicting the kings and aristocrats, the wealthy and powerful people in the old days for their overindulgence in rich foods and copious drinking. Today gout has become a disease of many men and women, primarily due to social change and population ageing, shifts in diet and lifestyle as well as increasing rates of obesity.^{1, 2} In western developed countries, gout is the most prevalent inflammatory arthritis. As estimated, about 3–6% men and 1–2% women have gout. In developing countries, gout prevalence tends to be lower with less than 1% in general.³ In 2017, the Global Burden of Disease Study estimated that over 41.2 million people had gout with more than 7.4 million new cases worldwide.⁴

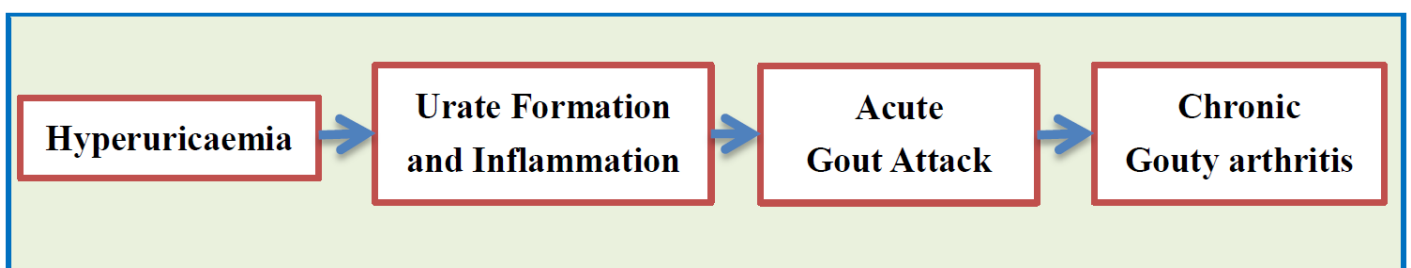
Causes and Clinical Manifestations of Gout

Gout is caused by sustained asymptomatic hyperuricaemia (i.e. increased uric acid levels in blood). Uric acids come from the breakdown purines which are substances naturally found in body's tissues (as cells die, they release purines) and in many foods. Normally, the body excretes most (about 70%) uric acids through the kidney in the urine and the rest through the gut.^{1, 2} However, uric acids can build up in the blood as a result of overproduction or under-excretion.

When crystallised in the form of needle-like urates and deposited in the joint or surrounding tissues, they would induce inflammation and trigger gout attack (Figure 1).^{2, 3}

For most cases, the first episode of acute gout attack involves a single joint, most commonly the big toe joint. But it can also affect other joints, such as ankle, knee, finger joint, wrist and elbow. The affected joint(s) would suddenly become intensely painful, red, swollen and hot. Although the first attack usually resolves in one to two weeks with no permanent damage to the joint, patients often have a second gout attack within 2 years. If the condition is not well managed, subsequent attacks would occur more frequently, involve more joints, have more severe symptoms, and last longer. Over time, enduring hyperuricaemia and repeated bouts of inflammation can lead to chronic gouty arthritis with tophi formation causing permanent joint destruction or even deformity.^{1, 3} Although not life-threatening, it would have a significant impact on patients' functional status and quality of life. It is noteworthy that hyperuricaemia may lead to crystals precipitating in the kidneys, resulting in kidney stone formation and gouty nephropathy. Gout is also closely linked to a number of chronic diseases, including hypertension, hyperlipidaemia, metabolic syndrome, cardiovascular diseases and diabetes.^{2, 3}

Figure 1: Progression from asymptomatic hyperuricaemia to chronic gout



Risk Factors of Gout

A number of risk factors can influence blood uric acid levels and contribute to gout attack (Box 1). Some of the risk factors are genetic and not modifiable, but many of the lifestyle- and

diet-related risk factors (such as excessive consumption of food and drinks high in purines) are highly modifiable.⁵

Box 1: Major risk factors for gout

Non-modifiable Risk Factors

Advancing age — Gout usually develops in adulthood. The likelihood of getting gout increases as people get older.⁶

Male — Gout is often considered a male disease.⁶ It occurs most frequently in men between the ages 40 and 60, but is less often seen in pre-menopausal women (as female sex hormones facilitate urinary excretion of uric acids). In population under 65 years of age, males have a four-fold higher prevalence of gout than do females. The gap narrows to 3:1 over 65 years.⁵

Family history of gout — Compared with the general population, individuals with first-degree relative suffering from gout would have about twice the risk of having gout.⁷

Ethnicity — Some ethnic groups, such as the Taiwanese Aborigines, Maori and Pacific Islanders living in New Zealand, or African Americans, have a prevalence more than two times greater than that of other ethnic groups.^{3,5}

Modifiable Risk Factors

Alcohol consumption — Beer and alcoholic beverages are high in purines. The dehydrating effect of alcohol would affect kidney function, making it hard to excrete uric acids. Compared with non- or occasional alcohol drinking, drinking ≤ 1 drink/day (or ≤ 12.5 g/day), drinking >1 to <3 drinks/day (or >12.6 g to <37.4 g/day), and drinking ≥ 3 drinks/day (or ≥ 37.5 g/day) was associated with 16%, 58%, and 164% increased risk of gout, respectively.⁸

Drinks high in fructose — Fructose, when metabolised in the body, releases purines and stimulates uric acid production. Studies showed that fructose consumption was associated with a 62% increased risk of gout.⁹ Soft drinks contain high amounts of fructose corn syrup. Compared with consumption of <1 serving (12 ounces or about 355 ml) of sugar-sweetened soft drink a month, the risk of gout for 1 serving per day of sugar-sweetened soft drink would increase 45% in men and 74% in women.^{10,11}

Excessive consumption of red meat, organ meat or seafood — They are purine-rich foods. Compared with men who consumed beef, pork or lamb <1 serving (112-168 g) per month, those consumed ≥ 2 servings per week would have 50% increased risk of gout. Compared with men who consumed <1 serving of dark-meat fish (such as salmon, mackerel and sardines) and other fish per month, those consumed ≥ 1 serving per week would have a respective 32% and 55% increased risk of gout. The corresponding risk for shrimp, lobster or scallops was 30% higher.¹²

Overweight and obesity — Greater adiposity (particular abdominal obesity) increases the risk of gout, possibly due to increasing production of uric acids and promoting insulin resistance with reduced renal excretion of uric acids.^{6,13} Compared with persons having a body mass index (BMI) of 20, the risk of gout among those with a BMI of 25, 30 and 35 would increase 78%, 167% and 262% respectively.¹⁴

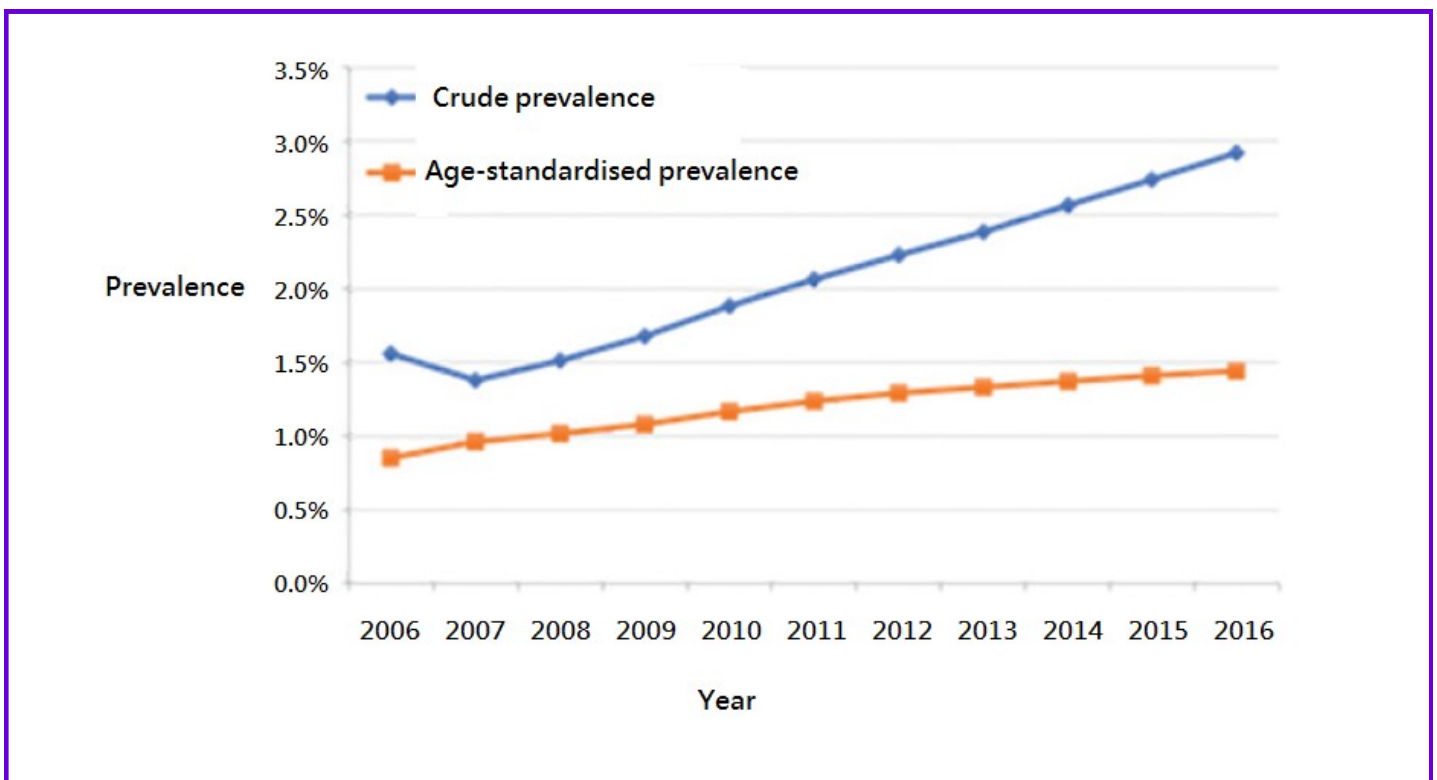
Use of certain medications — such as certain diuretics and anti-hypertensive drugs which can affect the function of the kidneys and thus can prevent elimination of uric acids from body. Compared to no diuretic use, diuretic use was associated with almost 2.5 times the risk of developing gout.¹³

Local Situation

Gout is an increasing common condition in both primary care and specialist practice. However, local epidemiological data on gout are scarce. To determine the prevalence of gout and use of urate lowering agents in Hong Kong, a population study analysed clinical data of over 2 700 000 patients who attended out-patient clinics or emergency departments of the Hospital Authority. Results showed that the crude prevalence of gout was 2.9% in 2016, which was similar to the rates in Western developed countries. After adjusted the effect of age distribution of the population, the age-standardised prevalence of gout rose continuously over the past decade and reached 1.4% in 2016 (Figure 2).¹⁵

Apart from population ageing, the rising trend of gout prevalence might be driven by an increase in lifestyle and dietary risk factors associated with hyperuricemia and gout, such as alcohol drinking, excessive consumption of purine-rich foods, overweight and obesity. Population Health Surveys conducted by the Department of Health (DH) observed a marked increase in drinking prevalence (i.e. having drunk alcoholic beverages in the 12 months preceding the survey) among people aged 15 and above from 33.3% in 2003/04 to 61.4% in 2014/15. The prevalence of overweight and obesity (with a BMI \geq 23) among persons aged 15–84 increased from 38.9% to 50.0% over the same period.^{16, 17} Telephone surveys also found that the proportion of people aged 18–64 consuming 4 tael or more red meat a day increased from 16.1% in 2009 to 18.0% in 2016.¹⁸

Figure 2: Prevalence of gout, 2006–2016



Source: Cheung et al, 2018.

Prevention and Management of Gout

There is no cure for gout yet. However, the disease can be treated with prescription drugs (such as urate lowering agents and anti-inflammatory drugs), appropriate dietary and lifestyle modifications. The followings are some action steps that help reduce uric acid levels, prevent gout attacks and stay healthy:

Eat a balanced diet. Avoid foods that are high in purines and limit consumption of moderate purine foods (Table 1). Study showed that a diet based on high intake of fruit, vegetables, nuts and legumes, low fat dairy products, and whole grains, but low intake of sodium, red and processed meats, would be useful in the prevention of gout and its comorbidities in high risk patients with hyper-uricaemia.¹⁹

Avoid alcoholic beverages and sugar-sweetened drinks high in fructose, including soda and commercial fruit juices with added sugars.

Stay well-hydrated to facilitate excretion of uric acids. As a general rule, adults are recommended to drink 6 to 8 glasses of fluid a day. To meet the daily fluid needs, plain water is the best.

Maintain an optimal body weight. For people who are overweight or obese, losing weight can decrease uric acid levels in the body. As rapid weight loss may temporarily raise uric acid levels, it is advisable to adopt a ‘stepwise’ approach.

Be physically active to achieve physical fitness and reduce the risk of obesity. People with gout or other chronic diseases (such as hypertension, heart disease and diabetes) can consult family doctor and obtain a customised exercise prescription.

Take medications as prescribed by the doctor. Consult with family doctor if already taking medication to determine if it can increase the risk of gout.

Table 1: Food examples by purine contents²⁰

High purine foods (with >200 mg/100 g serving that should be avoided as much as possible)	<ul style="list-style-type: none"> * Offal, including brain, liver, kidney, heart, pancreas * Oily fish, such as herring, mackerel, sardines, tuna, trout * Seafood, especially fish roe, mussels, scallops, oyster, dried shrimp * Game, such as rabbit, venison * Meat and yeast extracts, such as gravies
Medium purine foods (with 75-200 mg/100 g serving that should be limited or consumed according to the diet prescribed by dietitian)	<ul style="list-style-type: none"> ◇ Meat, including beef, pork, lamb ◇ Poultry, such as chicken, duck ◇ Dried peas, beans and legumes, such as baked beans, kidney beans, soya beans (tofu), lentils ◇ Mushrooms, such as winter mushroom ◇ Some vegetables, such as asparagus, cauliflower, spinach ◇ Wholegrains, including bran, oat, wholemeal bread
Low purine foods (with insignificant amount)	<ul style="list-style-type: none"> ✓ Dairy products, such as low fat milk, cheese, yoghurt ✓ Eggs ✓ Bread and cereals (except wholegrain) ✓ Rice, pasta and noodles ✓ Fruit and vegetables (see medium purine list)

Many people with gout falsely think “no pain, no problem”, without realising that urate crystal deposition may continue in the joints, soft tissues or kidneys silently during the time between acute attacks. If hyperuricaemia is not well managed, it can cause irreversible damage to the joints and lead to other complications. Thus, gout patients should work in partnership with family doctor and other healthcare professionals, follow the treatment plan including adherence to prescribed meal plans and medications, and adopt a healthier lifestyle to reduce the risk of gout attacks and maintain overall health.

From public health perspective, better control the modifiable lifestyle and dietary risk factors could help reduce the incidence of gout and associated complications. In May 2018, the Hong Kong SAR Government launched “Towards 2025: Strategy and Action Plan to Prevent and Control Non-communicable Diseases in Hong Kong” (SAP). Of the 9 local targets to be achieved by 2025, many are related to the prevention and control of gout and related complications, including Target 2: To reduce the prevalence of alcohol drinking among adolescents and adults, and Target 7: To halt the rise in obesity (and diabetes).²¹ The Government will step up efforts in promoting healthy diet and physical activity participation, enhancing public awareness about the importance of primary disease prevention, as well as working with the community in building a health-enhancing environment. For more information about the SAP, please visit the Change for Health Website <https://www.change4health.gov.hk/en/saptowards2025/>.

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TOWARDS 2025 | Strategy and Action Plan to Prevent and Control NCD in Hong Kong

Joyful Fruit Month 2019

The Department of Health (DH) has organised the annual “Joyful Fruit Day” event since the school year 2006/07 to promote daily fruit eating habit in schools. In the school year 2012/13, the event was upgraded from “Joyful Fruit Day” to “Joyful Fruit Month” and the whole month of April was designated as “Joyful Fruit Month” since then.

“Joyful Fruit Month” aims to create a favourable environment in which students are encouraged to eat an adequate amount of fruit every day through home-school cooperation. All schools are encouraged to systematically organise year-round activities to boost students’ interest in fruit eating. It is hoped that the fruit eating atmosphere within schools will be lifted to an unprecedented level throughout the “Joyful Fruit Month” in April. The slogan-theme for “Joyful Fruit Month 2019” is **“Two Servings of Fruit - Good for Health, Fun to Eat”**.

For more details about the “Joyful Fruit Month” and relevant activities, please visit <https://school.eatsmart.gov.hk/en/template/index.asp?pid=2008&id=3582>.

Non-Communicable Diseases (NCD) WATCH is dedicated to promote public’s awareness of and disseminate health information about non-communicable diseases and related issues, and the importance of their prevention and control. It is also an indication of our commitments in responsive risk communication and to address the growing non-communicable disease threats to the health of our community. The Editorial Board welcomes your views and comments. Please send all comments and/or questions to so_dp3@dh.gov.hk.

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