



Mini Review

Volume 5 Issue 3 – February 2018
DOI: 10.19080/NFSIJ.2018.05.555663

Nutri Food Sci Int J

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The Rising Incidence of Gout; is Obesity to Blame?



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Submission: December 09, 2017; Published: February 19, 2018

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Abstract

Once known as the disease of the ruling elite, gout's prevalence has now reached epidemic proportions, and for this, researchers say, obesity is to blame. Obesity, Body Mass Index and visceral fat have a liner correlation with serum uric acid increase and can influence the age of gout development. A reduce of selected high-calorie foods and specific lifestyle changes can optimize not only gout symptoms, but most importantly can prevent its manifestation at first place. This Mini-Review states the arguments supporting this hypothesis and suggests that the metabolic nature of the disease should be in more consideration.

Keywords : Gout; Obesity; Uric acid; Nutrition; BMI; Visceral fat; Exercise; Lifestyle

Abbreviations : BMI: Body Mass Index

Introduction

Individuals that produce high levels of serum urine acid (>7.0mg/dl) or are unable to shed urin acid superfluity tend to manifest a condition, known as hyperuricemia. At the 15% of the cases, if hyperuricemia continues for a long time it can lead to gout, a painful disease, caused by the buildup of uric acid crystals in the joints. However, the disease has now epidemic dimensions, and for this, researchers say, obesity is to blame [1-4].

Obesity, C, Visceral Fat and Gout

A study of 3.529 subjects in China showed that serum uric acid had liner correlation with obesity [5]. In particular, higher Body Mass Index (BMI) and waist circumference lead to an increase of visceral adiposity. This increase causes leptin production and higher insulin resistance [6]. The degree of insulin resistance correlates directly with the serum rate level and inversely with the renal rate clearance [7,8]. Leptin has been found to be a pathogenetic factor for hyperuricemia in obese patients and has been hypothesized to be the link between those two [9,10]. High BMI, also, increases blood pressure and serum triglycerides concentration, leading to hypertriglyceridemia, which promotes uric acid increment [6].

Furthermore, obese people are commonly characterized by a low muscle mass. A decrease of muscles can be associated with low-intensity chronic inflammation which dramatically increases uric acid in serum. That rise works as a defense mechanism for the organism in order to rebalance the intense oxidative stress resulting from muscle mass reduction [6].

However, until recently, it had not been proven that visceral fat increase is to blame for gout onset, rather than the amount of total fat [9]. In a study of 103 male patients and 204 age-matched healthy controls, visceral fat obesity was observed more frequently in patients with gout even in non-obese individuals. In addition, non-obese gout patients had hypertriglyceridemia and were pre-hypertensive more frequently than healthy controls [9]. Therefore, visceral fat obesity might more properly represent metabolic derangements rather than obesity itself. [9].

Obesity is not only a risk factor for gout incidents, but also for the age of potential gout development [10]. A study of 15.533 male participants, which began in 1989 [Campain Against Cancer and Heart Disease (CLUE II) study], have found that students who were obese at the age of 21 developed gout attacks approximately 11 years earlier than their non-obese counterparts. In the female adjusted analysis, provided by McAdams DeMarco's work, no differences were observed in the association of obesity and gout between the two sexes [10].

Foods Inciting Both Gout and Obesity

Recent studies have associated the consumption of selected high-calorie foods and drinks with both obesity and gout risk. A general summary of specific foods and drinks associated to high levels of serum uric acid and their caloriecontent is presented in (Table 1). Habitual consumption of purine-rich red meat, refined carbohydrates (such as white bread, pasta, sugar) and saturated fat are commonly included in an obese

person's diet and according to studies, are highly associated with gout incidents by promoting insulin-resistance and increasing levels of plasma glucose, triglycerides, LDL-C and serum urate [11,12]. Highly processed foods (such as chips, snack foods, frozen dinners) and sugary beverages increase the risk of gout development, as well as the risk of obesity and type 2 diabetes [13]. Selected purine-rich seafood and vegetables, such as shrimps and spinach, should also be avoided since they can elevate uric acid levels whether the person is obese or not [14]. Concerning alcohol, a research investigating the association between alcohol calorie and overweight found that the odds of obesity were significantly higher with increased consumption of alcohol [15]. Meanwhile, alcohol is known to be a risk factor for gout development since ethanol ingestion accelerates adenosinetriphosphate degradation into uric acid precursors [16,17] which decreases urate excretion and increases urate production [17]. Beer has a greater effect on gout than any other type of alcohol since, alongside with ethanol, it contains high levels of guanosine, which is a highly absorbable purine [15]. All in all, a tempered consumption of the foods and drinks above can have a beneficial effect both on weight and gout control (Table 1).

Table 1: Summary of foods and drinks associated with serum uric acid increase and their calorie content, in descending order.

100gr of High-Calorie Foods	Calorie (kcal)
Chips	536,1
Sugar	386,7
Lamp	294
White bread	264,6
Beef	250,5
Pork	242,1
Pasta	131
Shrimp	99
Spinach	23
High-Calorie Drinks	
Beer (425ml)	215
Sugary Beverages (330ml)	139
Wine (175ml)	126

Lifestyle Changes

Prevention of gout disease is still rooted in lifestyle choices. In order to deteriorate gout symptoms due to obesity, the first step is to lose weight. According to recent studies, patients with gout disease who lost sixteen pounds by exercising reduced their uric acid levels approximately three points. In addition, exercise can mediate high blood pressure, cholesterol and type 2 diabetes which have been associated to gout disease according to a 2015 European study of 3.079 gout patients [11,18]. The substitution of red meat by vegetables lowers the risk of Gout development by 27% [19,20]. Other important nutrients from vegetable sources, such as fiber or unsaturated fat, contribute to reducing long-term weight gain and lowering

insulin resistance [11], which repeatedly has been shown to unbalance serum uric acid normal levels [7,8].

Conclusion

Therapists have been occasionally treating gout as an inflammatory arthritis; hence, the metabolic nature of the disease requires a different approach which treats the patient and not the joint. A personalized diet combined with regular exercise may be a complementary treatment not only for the deterioration of gout symptoms, but most importantly, for the prevention of its manifestation. Both medical and nutritional studies have proven the correlation between obesity and serum uric acid levels, which is enough to actuate further investigations.

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DOI: [10.19080/NFSIJ.2018.05.555663](https://doi.org/10.19080/NFSIJ.2018.05.555663)

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