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HOTLINE

Health Professionals Follow-up Study on Gout: What Do We Now Tell Patients About Diet and Alcohol?

Recent reports published in the New England Journal and the Lancet have raised public interest and fueled controversy about the a classic topic in rheumatology; namely, relationship between diet, alcohol intake and gout. This ACR Hotline provides a state of the art review of this topic from an expert in the field.

The Bottom Line:

- Dietary trends, increasing obesity and Metabolic Syndrome prevalence are contributing to the increasing prevalence of gout in the U.S.
- Gout patients need to pay attention to weight management, including moderation in the intake of meat and seafood rich in cholesterol and saturated fatty acids and restraint in consumption of foods and drinks with non-complex carbohydrates. High fat intake and ketosis factoring into current, popular "low-carb" diets have a variety of health risks including possible worsening of gout.
- In the obese, controlled weight management and reduction in alcohol consumption have the potential to lower serum urate in a quantitatively similar way to relatively unpalatable "low purine" diets.
- For patients with established gout, moderation in the consumption of not only beer but also other forms of alcohol is essential. Moderate beer consumption is acceptable in most patients with therapeutically well-controlled hyperuricemia and gout.
- Nonfat milk and low-fat yogurt have a variety of health benefits, but dairy products have not yet been established to have clinically meaningful antihyperuricemic effects for patients with established gout.

Introduction

Gout is well understood and usually one of the easiest of all common rheumatic diseases to manage (1). At the same time, the prevalence of gout has risen substantially over the last two decades in the U.S.. Insulin resistance (IR), a central factor in Metabolic Syndrome, promotes hyperuricemia. Moreover, the dramatic rise in prevalence of obesity and Metabolic Syndrome in the U.S. appears to be a major contributor to increasing gout prevalence. Other factors in the rise of gout prevalence include increases in hypertension and advanced renal disease, steadily increasing use of diuretics, as well as greater longevity of the population and more prolonged survival of subjects with advanced forms of renal and cardiac disease. Significantly, gout prevalence appears to be rising particularly rapidly among the elderly and in postmenopausal women.

It is a broadly held clinical impression that an increase in numbers of complex and refractory cases of gout is compounding the rise in gout prevalence in the U.S. over the last few decades. Refractory gout often reflects the limitations of an older generation of drugs for lowering serum urate that includes allopurinol and probenecid (1). As a result, there has been renewed attention to the importance for serum urate lowering of dietary and lifestyle modifications beyond simple weight management. Such modifications may serve as a primary measure to reduce the risk of developing gout in predisposed subjects or as a complementary approach to pharmacologic serum urate lowering in patients with gout that is difficult to manage.

Background

The association of elevated alcohol consumption with gout is well recognized, and physiologically consistent with the stimulatory effects of alcohol intake on hepatic uric acid production and on renal urate reabsorption. As such, it has generally been recommended that gout patients limit consumption of all forms of alcohol.

In the past, relatively unpalatable "low purine" diets were employed as an antihyperuricemic measure, with the expectation of a maximum of ~15% reduction in serum urate (2). Importantly, recent years have seen a surge in popularity of "low-carbohydrate, high protein diets" (e.g., Atkins, Zone, and South Beach diets). In a small, open study in overweight male gout subjects, a calorically restricted diet designed for IR management, with a 40/30/30 protein/carb/fat scheme and customized for high contents of seafood and mono-unsaturated fat as well as continued moderation in alcohol, achieved body weight lowering by ~17 pounds and also diminished hyperuricemia by 17 percent (3). But these results cannot be

directly extrapolated to popular “low-carbohydrate” type diets, for which an adequately powered clinical trial in hyperuricemia and clinical gout has not yet been done.

Summary Information

Findings have emerged that suggest changes in dietary patterns, including increased meat and seafood consumption, and possibly decreased dairy product consumption, are contributing to rising gout prevalence in the U.S. and possibly other societies (4). Specifically, a prospective 12-year study by Choi et al at Harvard Medical School has been performed that involved more than 47,000 male medical professionals aged 40 and older without gout at baseline (“The Health Professionals Follow-up Study”). Over the follow-up period, in which 730 new cases of gout developed, there was a multivariate relative risk of 1.41 for incident gout in the quintile with the highest meat intake compared to the quintile with the lowest meat intake (4). Similarly, for seafood, the multivariate relative risk was 1.51. In contrast, the multivariate relative risk of incident gout was reduced to 0.56 for dairy products, an association that on further analysis held up only for those regularly consuming “low fat” dairy products (defined as frequent low fat yogurt intake or drinking two or more glasses of skim milk per day as opposed to less than one glass per month) (4). Interestingly, the levels of dietary intake of purine-rich vegetables and total protein did not correlate with risk of incident gout.

The Health Professionals study also found that even moderate regular consumption of beer was associated with a high risk of development of gout (multivariate relative risk of 1.49 per 12-oz beer serving per day) (5). Consumption of alcohol spirit beverages was associated with a multivariate relative risk of incident gout of 1.15 per shot (5). In contrast, moderate wine consumption of 1-2 glasses per day was not associated with significant change in the risk of incident gout in this study (5).

Several of the aforementioned conclusions of the Health Professionals study were previously suggested by smaller studies. But the prospective design, long-term follow-up, and uniquely large size of the Health Professionals study render the conclusions particularly compelling.

Limitations of the study include: 1) assessments were primarily restricted to middle-aged male health professionals; 2) lack of assessment of serum urate levels; 3) lack of requirement for confirmation of gout diagnosis by synovial fluid crystal analysis; 4) sole reliance on questionnaires for data on diet and hypertension; and 5) lack of data for Metabolic Syndrome (4). The linkage of greater meat and seafood consumption to higher incident gout is not surprising (4). But the apparent protective effects for incident gout of dairy products remains to be proven. In this context, the milk proteins casein and lactalbumin have been reported to have uricosuric effects, but directly increased dietary milk protein did not have a therapeutically significant effect on serum urate in a controlled study done in postmenopausal nuns. Ascertainment bias may underlie the association of low-fat dairy product consumption with less incident gout (4). In effect, "skim milk drinkers" may be more attuned to health issues including hyperlipidemia and weight management. Furthermore, recent observations suggest dairy products assist in burning fat and promoting weight loss, likely mediated in part by increased dietary calcium.

The striking differences in incident gout risk between beer and wine in the Health Professionals study (5) need to be interpreted in the context of the decline in overall alcohol consumption per capita in the U.S. over the last 20 years. Over the same period, beer consumption has grown, particularly including that of the heavily advertised “light beers”, which contain ~25-35% fewer calories than regular beer per serving because of reductions in carbohydrates. Beer has a high purine content, predominantly as readily absorbable guanosine and beer intake heightens urate production, compounding stimulatory effects of alcohol metabolites on renal urate reabsorption. But there have been no adequate direct comparisons of the effects of beer and wine on urate production, serum urate levels, or on possible provocation of acute gouty arthritis. Moreover, the observation of lack of an increased risk of incident gout with moderate wine consumption (5) may reflect ascertainment bias from as-yet unidentified factors. In essence, male “wine drinkers” may be different from “beer drinkers.”

Practical Issues

The applicability to patients with established gout of conclusions from the Health Professionals study of incident gout (4,5) is not yet clear. This is the case not only for patients with disease that is well-controlled on allopurinil or uricosuric therapy but also for more complex cases in which multiple co-existing medical conditions and medications are driving accelerated deposition of urate crystals in tissues.

Recommendations for Patients

Consumption of meat, seafood, and alcoholic beverages in moderation and attention to food portion size and content of non-complex carbohydrates (“simple sugars”) are cornerstones of healthy living and have salient benefits for prevention and management of gout and hyperuricemia. There are wide concerns about long-term health risks (not

limited to atherosclerosis) with currently popular “low carb” diets. There also are specific and recent well-publicized concerns about the potential for ketosis and other effects of popular “low carb” diets heightened in animal protein and fat to exacerbate hyperuricemia and gout. Subjects with gout already self-committed to such “low carb” diets should make every effort to restrain fat content and meat or seafood portion sizes of meals, to be careful to avoid “crash weight loss”, and to moderate alcohol consumption. Consumption of vegetables with high purine content or a diet high in protein by themselves do not appear to raise the risk of developing gout.

At this point, it would be premature to conclude that dairy products have direct protective effects for the development of gout or that moderate wine consumption is preferential to moderate consumption of other forms of alcohol for patients with established gout. But it is possible that even moderate regular beer consumption factors into the risk for developing gout in middle-aged men, possibly reflecting the relatively high purine content of beer. “Light beers” would not be expected to provide a significant advantage over “regular beers” with respect to direct effects on serum uric acid, but longer-term effects on weight management and glucose tolerance could be meaningful if “light beer” consumption remains moderate.

Hotline Author: Robert Terkeltaub, MD, VA Medical Center/University of California San Diego, San Diego, CA
Disclosure: Dr. Terkeltaub currently serves as a paid consultant to Novartis Pharmaceuticals and to TAP Pharmaceuticals.
Hotline Editors: Eric L. Matteson, MD, MPH; Arthur Kavanaugh, MD.

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