Published in final edited form as:

J Clin Rheumatol. 2015 June ; 21(4): 225–226. doi:10.1097/RHU.0000000000000246.

An Internet Survey of Common Treatments used by Patients with Gout Including Cherry extract and Juice and other dietary supplements

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Keywords

Gout; cherry extract; cherry juice; complementary medicine; allopurinol; febuxostat; Internet study; survey; natural supplements

Gout is the most common inflammatory arthritis in adults [1]. Recent studies have documented the low adherence to urate-lowering therapy (ULT) (1, 2). Gout was associated with a medication possession ratio of 36%, the lowest among seven chronic conditions studied [4]. Qualitative research with gout patients has identified several important issues including: (1) patient concerns related to ULT side effects, drug-drug interactions and potential long-term toxicity; (2) adherence challenges related to chronic disease medication management; and (3) patient perception of the role of diet in gout management [5–7]. Patients with gout report using non-pharmacologic interventions for treatment of gout and prevention of flares, including the intake of cherries and/or cherry extract [6] and monitoring of diet and fluids [7]. There is an increasing interest in the role that dietary supplements such as vitamin C, cherry and cherry extract can play, all of which have been shown to decrease the risk of gout and/or gout flares [8]. A recent study found that patient prioritized that role of food, supplements and vitamins in gout as the top research questions [9].

Despite the recent interest in diet and supplements, there are only limited data on the prevalence of use of cherry extract and supplements for gout. Zhang et al. reported that 42%

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Financial Conflict: There are no financial conflicts related directly to this study. J.A.S. has received research and travel grants from Takeda and Savient; and consultant fees from Savient, Takeda, Regeneron, Allergan and Novartis. N.L.E. has received consultation fees from Takeda, Crealta, AstraZeneca, and Cymabay Pharmaceuticals. A.B. has no conflicts to declare.

IRB approval: The University of Alabama at Birmingham's Institutional Review Board approved this study and all investigations were conducted in conformity with ethical principles of research.

gout patients used cherry or cherry extract or both in their Internet case-control study [8]. To our knowledge, there are no other studies of characteristics of patients who use supplements for gout. Therefore, using a cross-sectional survey, we aimed to assess the use of cherry extract/products and other supplements by gout patients.

People visiting the Gout and Uric Acid Education Society's website (<http://gouteducation.org>) were invited to participate in a brief anonymous Internet survey on a voluntary basis between 11/20/2013 and 4/1/2014 (Online Supplement 1). We collected information on age, gender, race, gout diagnosis, duration, number of gout flares in the last month, physician prescription of allopurinol or febuxostat, number of days ULT was missed by the patient in the last month, use of cherry extract or cherry juice and use of other natural treatments for gout. The Institutional Review Board at the University of Alabama at Birmingham approved this study. We used chi-square test for categorical or t-test for continuous variables. A p-value <0.05 was considered statistically significant.

Of the 293 survey respondents, 220 (75%) reported gout, 61 reported no gout (21%) and 12 subjects (4%) did not respond to this question. Mean age of gout survey responders was 55.2 years (standard deviation, 14.1), 74% were men and 79% were White. Disease duration was 1 year in 29% and >10 years in 20%. Gout flares were common, with 87% with 1 gout flare in the last month (i.e. >3/year). 54% had been prescribed allopurinol or febuxostat. 43% participants were taking cherry extract or cherry juice and 25% were taking other natural supplements; 50% were taking cherry extract, cherry juice and/or other natural supplements.

Cherry extract or juice intake was similar across gender, age groups and race (Table 1). 27% men and 18% women reported using other food items/natural supplements (Table 1). Proportions using natural supplements were across categories of race and age and similar. 42% of gout patients expressed interest in a future clinical trial of natural supplements for gout.

Compared to gout patients not taking the supplements, those taking supplements (cherry extract/juice or other supplements) had: (1) significantly lower number of gout flares in the last month, 1.91 vs. 1.54 (p=0.047); (2) trend towards lower % with no gout flares in the last month, 17.3% vs. 8.3% (p=0.06); (3) trend towards lower proportion with ULT medication possession ratio of 80%, 85% vs. 69% (p=0.053); and (4) a trend towards higher numbers of days of ULT missed in the last month, 4 vs. 7 days (p=0.11).

We made several interesting observations. First, almost 50% of gout patients used cherry extract/juice or other supplements (see Table 1 footnote), extending a similar finding that 50% of Americans use supplements [10], to patients with gout. 43% of our participants used cherry extract or juice, similar to that reported from an Internet case-crossover study, [8] supporting the reproducibility of data from Internet gout studies. Second, compared to non-users, cherry extract/juice users had significantly lower gout flares in the previous month. This indicates an association and not causation. This may indicate that people with less severe gout (lower number of gout flares) are more likely to take cherry extract/juice rather than prescription ULT medications vs. the conclusion that cherry extract/juice intake is

associated with a lower risk of gout flares. Third, there was a non-significant trend towards lower ULT adherence in patients taking cherry juice/extract. Again this might indicate that patients with less severe gout have lower ULT adherence or that there is a negative effect of cherry use on ULT adherence. These hypotheses need to be tested in future studies. Forth, only half of the survey participants reported ULT prescription by their physician, lower than previously reported [2]. Importantly, 42% gout patients were interested in a future gout trial assessing non-pharmacological treatments, which is very encouraging.

A key limitation of our study was patient self-selection. The study findings may not generalizable to all gout patients, only to gout patients who use the Internet. A cross-sectional study design does not allow for causation to be established, i.e., the effect may be in either direction of an association. Sample size was moderate; therefore we may have missed some associations. The main strengths of our study were a focus on the issues relevant to the patients with gout. Our study adds new knowledge to the area of non-pharmacological treatments of interest to gout patients [5, 6, 11].

In summary, this study highlights that gout patients use natural supplements, most commonly cherry extract and/or juice. Patients have high degree of interest in non-pharmacological therapies for gout. We also noted novel associations between natural supplement use and ULT adherence and gout flare rate that should be the foci of future research. Researchers and funding agencies should now take these priorities into consideration while setting future research agenda in gout.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Grant support: This material is the result of work supported by research funds from the Division of Rheumatology at the University of Alabama at Birmingham and the resources and use of facilities at the Birmingham VA Medical Center, Alabama, USA. JAS is supported by grants from the Agency for Health Quality and Research Center for Education and Research on Therapeutics (AHRQ CERTs) U19 HS021110, National Institute of Arthritis, Musculoskeletal and Skin Diseases (NIAMS) P50 AR060772 and U34 AR062891, National Institute of Aging (NIA) U01 AG018947, and National Cancer Institute (NCI) U10 CA149950, and research contract CE-1304-6631 from Patient Centered Outcomes Research Institute (PCORI).

We thank Ms. Shore and the technical staff for allowing access to The Gout and Uric Acid Education Society website survey function and assisting with this survey.

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Table 1

Patient characteristics of survey respondents, overall and by gender, age and race

	Gender			Age group			Race		
	All patients	Male	Female	50 yrs	>50 to 65 yrs	>65 to 80 yrs	>80 yrs	Non-White	White
Disease duration		p<0.001		P=0.46				P=0.19	
1 year	29%	21%	52%	30%	24%	34%	40%	33%	28%
>1 to 5 yrs	31%	32%	27%	38%	28%	23%	20%	40%	28%
>5 to 10 yrs	20%	24%	8%	15%	23%	25%	0%	14%	21%
>10 yrs	20%	23%	13%	16%	24%	18%	40%	12%	23%
Number of gout flares in last month		P=0.023		P=0.075				P=0.21	
0	13%	13%	11%	10%	13%	16%	20%	21%	10%
1	40%	47%	23%	42%	43%	36%	0%	29%	43%
2	23%	22%	27%	23%	18%	29%	60%	26%	23%
3	14%	12%	21%	18%	12%	14%	0%	17%	14%
4	3%	2%	6%	3%	1%	4%	203%	5%	3%
5	6%	4%	11%	4%	12%	0%	0%	2%	7%
% prescribed		P=0.84		P=0.41				P=0.15	
Allopurinol or febuxostat	55%	54%	56%	54%	58%	52%	20%	64%	52%
% taking		P=0.93		P=0.71				P=0.08	
cherry extract or juice	43%	43%	42%	45%	38%	48%	40%	31%	46%
% taking		P=0.17		P=0.06				P=0.81	
other natural treatments	25%	27%	18%	30%	23%	14%	60%	26%	24%
% taking		P=0.81		P=0.58				P=0.33	
either cherry or natural treatments*	51%	50%	52%	47%	59%	48%	40%	57%	49%

Bold p-values indicate statistically significant results.

* 48 patients were taking other natural treatments (many patients mentioned >1 treatments, therefore the total is >48):

Water, n=7; Celery seed, n=5; lemon/lime juice, n=4; Vitamin C, n=4; Vinegar, n=4; Turmeric, n=4; baking soda, n=4; Ginger/garlic, n=3; Diet, n=2; Banana leaf, n=2; blueberry, n=2

Following were reported by one patient each: Devil's claw, Cleanse Uric Acid, Dandelion green, Fish oil, folic acid, GC gout care, honey, cinnamon, tea, lion's mane, pineapple, Apple cider, pomegranate juice, milk, potassium, tomato soup, dates, almond