

Clinical characteristics of juvenile gout and treatment response to febuxostat

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Supplemental methods

Subjects and data collection. This study was approved by the Institutional Review Board of Guangdong Second Provincial General Hospital. A retrospective analysis was performed in 111 children (age \leq 18 years) and 533 adult patients with gout from January 2016 to November 2020. All cases fulfilled the 2015 American College of Rheumatology / European League Against Rheumatism criteria for primary gout.[1] All patients had an acute attack of single joint, elevated blood uric acid, and diagnostic formation by ultrasound, polarized light microscopy and/or dual-energy CT examination. Patients with other forms of inflammatory arthritis or positive autoantibodies including anti-nuclear antibodies, anti-extractable nuclear antigen, rheumatoid factor and anti-cyclic citrullinated peptide were excluded from the study. Demographic information, clinical characteristics, laboratory findings and response to therapy were recorded. Longitudinal data was analyzed for 37 juvenile gout patients that received uric acid lowering treatment.

Distinguishing gout and juvenile idiopathic arthritis (JIA). A diagnosis of gout excludes consideration of JIA based on current classification criteria. Without the diagnosis of gout, 51 / 111 patients (45.9%) would have fulfilled the International League of Associations for Rheumatology (ILAR) criteria for JIA (age of onset < 16 years and joint inflammation for > 6 weeks) [2]. Among this group, 32 and 19 patients fulfilled criteria for oligoarticular JIA and polyarticular JIA, respectively, based on the number of joints involved.

While further studies comparing juvenile gout and JIA are needed, our collective experience suggests that these entities can be distinguished in several ways. First, gout usually presents with rapid onset of joint pain and swelling, whereas the evolution of joint inflammation in JIA is

more chronic and at least 6 weeks of symptoms are required for diagnosis. Gout affects male adolescents, particularly those with high BMI and a family history of gout, while JIA patients show a wide age distribution and slight male predominance in some subtypes. Knee, ankle and wrist are the most affected joints in JIA, often with symmetric involvement. In contrast, asymmetric finger involvement is the most common presentation of juvenile gout in our cohort. Lastly, we routinely measure serum uric acid for adolescent patients with joint complaints as hyperuricemia is a hallmark of juvenile gout not typically seen in JIA.

Statistical analysis. Database management and statistical analyses were performed with SPSS 13.0. Quantitative variables were presented as mean \pm standard deviation (SD), categorical variables were indicated as percentages (%). Comparisons of the differences of continuous variables were performed by the Student's t-test. Categorical variables were compared with the χ^2 -test. A P value <0.05 was accepted as significant.

References

1. Neogi T, Jansen TL, Dalbeth N, Fransen J, Schumacher HR, Berendsen D, et al. 2015 Gout classification criteria: an American College of Rheumatology/European League Against Rheumatism collaborative initiative. *Ann Rheum Dis*. 2015 Oct; 74(10):1789-1798.
2. Petty RE, Southwood TR, Manners P, Baum J, Glass DN, Goldenberg J, et al. International League of Associations for Rheumatology classification of juvenile idiopathic arthritis: second revision, Edmonton, 2001. *The Journal of rheumatology*. 2004 Feb; 31(2):390-392.

Supplemental Table 1. Clinical features of gout in children and adults.

	Juvenile Gout (n=111)	Adult Gout (n=533)	p value
Age of onset (years)	15.2±2.0	46.7±14.9	<0.001
Sex (M/F)	107/4	498/35	0.281
Family history (n)	43 (38.7%)	82 (15.4%)	<0.001
Kidney stones (n)	8	132	<0.001
Hypertension (n)	1	126	<0.001
Diabetes (n)	1	18	0.223
BMI (kg/m ²)	24.8±4.6	25.5±3.8	0.097
Underweight (n)	9(8.1%)	10(1.9%)	<0.001
Normal (n)	53(47.8%)	224(42.0%)	0.448
Overweight (n)	23(20.7%)	174(32.7%)	0.011
Obesity (n)	26(23.4%)	125(23.5%)	0.995
sUA (mg/dL)	11.9±2.5	9.0±2.2	0.032
sCr (mg/dL)	1.1±0.2	1.4±0.7	0.017
Time to tophi (year)	1.5±1.0	7.5±4.8	<0.001
Tophi (n)	31 (27.9%)	129 (24.2%)	0.401
Joints affected by tophi			
Elbow (n)	6 (9.1%)	31 (12.3%)	0.463
Wrist (n)	0 (0)	17 (6.8%)	0.030
Finger (n)	21 (31.8%)	42 (16.7%)	0.006
Knee (n)	7 (10.6%)	25 (10.0%)	0.877
Ankle (n)	8 (12.1%)	43 (17.1%)	0.324
MTP (n)	15 (22.7%)	73 (29.1%)	0.305