Prevalence and Risk Factors of Symptomatic Hyperuricemia; Quality of Care of Patients with Hyperuricemia in A University Hospital

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Objective: *To determine the prevalence and to identify the risk factors of symptomatic hyperuricemia (SHU) and the proportion of patients given advice and treatment of urate lowering agent (ULA) with appropriate indication.*

Material and Method: *One hundred and sixty patients who were new patients at Siriraj Hospital in 2009 with hyperuricemia were reviewed from medical records and collected demographic data, common risk factors of hyperuricemia and management. Patients were excluded if they had previously been diagnosed as SHU, took ULA, or had hematologic malignancy. Logistic regression was applied to explore the risk factors associated with SHU.*

Results: *Seventy-six percent of patients were male; mean (SD) age was 56.5 (14.7) years; mean (SD) of follow-up duration was 14.5 (7.5) months. The prevalence of SHU was 35 (95% confidence interval (CI): 28, 43) %; gout was the most common manifestation and accounted for 89%. The significant risk factors of SHU identified from univariate analysis were male, serum uric acid > 9 mg/dL and renal insufficiency with odds ratio (OR) (95% CI) of 3.7 (1.4-9.5), 4.1 (2.1-8.3) and 2.6 (1.3-5.4), respectively. In multivariate analysis, these variables remained significantly associated with SHU with OR (95% CI) of 3.4 (1.2-9.4), 3.6 (1.7-7.7) and 2.3 (1.0-5.0), respectively. Thirty-one percent of patients were given advice as recorded in medical records which included reducing alcohol drinking (24%), stopping smoking (26%), reducing body weight (13%), performing exercise (10%) and restricting diet (18%). Thirty patients (67%) were prescribed ULA according to the recommended indication.*

Conclusion: *SHU was quite common among hyperuricemia in the university hospital. Male and serum uric acid concentration were associated with SHU while renal insufficiency had a marginal association. Only 31% of patients were given education and 67% of patients treated with allopurinol with appropriate indication. There was an opportunity to improve quality of hyperuricemic care.*

Keywords: *Hyperuricemia, Symptomatic hyperuricemia, Gout, Allopurinol, Quality of gout care, Quality of hyperuricemia care*

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Hyperuricemia (HU) is a common medical condition and is increasing nowadays.The prevalence of HU from US population-based studies increases from 18%[1] in 1988-1994 to 21%[2] in 2007-2008. The prevalence of HU in Thailand also increased from 10.6% in 1999-2000[3] to 24.4% in 2009-2010[4]. In most epidemiologic studies, HU is defined as a serum urate (SU) level > 7 mg/dL in male and > 6 mg/dL in female. Serum urate concentrations beyond saturated point (concentrations more than 6.8 mg/dL at 37°C) are associated with developing arthritis and renal calculi, although one needs to stay in the condition for a long time. It has been reported that men with SU from 9 mg/dL had annual incidence of gout at 4.9% and a 5-year cumulative incidence of 22%[5]; however, it is estimated that only 30% developing gout in their life times. HU is associated with glucose intolerance, hypertension, hyperlipidemia, obesity and renal insufficiency. Overweight, beer and spirits drinking, imbibing fructose and sugar-containing drinks and eating meat and seafood are the risk factors for developing gout while weight loss, ingestion of low-fat dairy products, vitamin C and coffee are protective factors[6-11].

Hyperuricemia and gout should be treated by both non-pharmacologic and pharmacologic strategies[12]. Non-pharmacologic treatments are

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reduction of alcohol drinking, losing weight in overweight patients and low animal purine diet[12] which should be applied in all patients. Screening and treatment of co-morbidities (hyperlipidemia, hypertension, diabetes and obesity) and their risk factors should be considered[12]. Recommended indications of urate lowering agent in Thailand are recurrent arthritis more than 2 times/year, tophi, chronic erosive arthropathy, and urate nephrolithiasis. The goal of treatment is the SU at or below 6 mg/dL[13].

In appropriate management of hyperuricemia and gout is quite common at 25-57%[14]. A study from UK reported the rate of prescribing allopurinol in asymptomatic hyperuricemia was high at 57%[14]. Allopurinol was also in appropriately prescribed at 47% in a university hospital in Thailand[15]. The present study aims to determine the prevalence and the risk factors of symptomatic hyperuricemia (SHU) and to identify the proportion of patients given advice and urate lowering treatment with appropriate indication.

Material and Method

The present study was a retrospective cohort study. Hyperuricemia in this study was defined as SU > 7 mg/dl in both male and female. New hyperuricemic patients in the year of 2009 were extracted from the laboratory database. The eligible population was consecutive new patients visiting at Siriraj Hospital, Thailand since January 1, 2009 (hospital number 52-XXXXXX) to December 31, 2009. The inclusion criteria were patients aged 18 years old or more who had hyperuricemia. They had to be followed-up at least 1 time after known hyperuricemia. Patients were excluded if they had been diagnosed of SHU, including gout, chronic tophaceous gout, renal stone, or uric acid nephropathy, or taken a urate lowering agent before visiting at Siriraj Hospital. Patients with hematologic malignancy were also excluded from this study. The study was approved by Siriraj Institutional Review Board.

Clinical demographic data including age, sex, renal function testing, SU levels, weight, height, body mass index (BMI), history of alcoholic drinking and history or diagnosis of diabetes mellitus, hypertension, dyslipidemia, ischemic heart disease, cerebrovascular disease, psoriasis, low dose aspirin use and diuretic use were recorded. BMI of more than 25 kg/m^2 was defined as overweight-obesity[16]. Renal insufficiency was defined as serum creatinine > 1.5 mg/dL. Diabetes mellitus was ascertained if fasting plasma glucose level was more than 126 mg/dl or the subject had a history of diabetes or treated with antidiabetic agents.

Definition of symptomatic hyperuricemia and quality of hyperuricemia care

SHU in the present study was defined as acute gouty arthritis, tophaceous gout and renal stone. Acute gouty arthritis was diagnosed by using American Rheumatism Association preliminary criteria for the classification of the acute arthritis of primary gout[17], New York criteria[18], or Rome criteria[18]. Tophaceous gout was diagnosed by physical examination or radiography. Renal lithiasis was defined by history of passing stone, or diagnosed by ultrasonography or intravenous pyelography. Last allopurinol dosage was defined as the time of dosage ordered before last SU evaluation of more than 2 weeks. Quality of care in this study focused on: 1) all patients should be advised of life style modification, for instance, weight reduction, increased exercise, reduced alcohol drinking, or diet control; 2) urate lowering agent was prescribed according to recommended indication of urate lowering agent in Thailand, recurrent acute attacks more than 2 times/year, tophi, chronic erosive arthropathy, or urate nephrolithiasis; 3) allopurinol should be started at low dosage, 100 mg/day; 4) patients taking urate lowering agent should be adjusted dosage until SU $\leq$ 6 mg/dL[13]. All data were collected from medical records from January 1, 2009 to March 31, 2012.

Sample size and statistical analysis

The present study estimated the prevalence of SHU of this study at 30%. The margin of error in estimating prevalence was set at 10%. All analyses were performed as two-sided with the minimum significant level set at 5%. This resulted in estimated sample size of 81. Comparison of categorical variables was determined by Pearson x^2 test or Fisher's exact test, where appropriate. The student t-test or Mann-Whitney U test was used to compare continuous variables. Demographic characteristics were presented as frequency counts, percentages, mean and standard deviation (SD). Univariate logistic regression was applied to determine the association of SHU and the reported common risk factors (age, sex, overweight-obesity, alcohol intake, diuretic use, low-dose aspirin, renal insufficiency, hypertension, dyslipidemia and diabetes mellitus). The variables, which were a significant difference between 2 groups with $p < 0.1$ in univariate analysis, would be further analyzed using multiple logistic regression and reported as odds ratio with 95% confidence interval (CI). Statistical analyses

were done by SPSS 13.0 for Windows.

Results

One hundred and sixty patients were consecutively enrolled in the present study; 122 (76.3%) patients were male; mean age (SD) and follow-up duration of the patients were 56.5 (14.7) years and 14.5 (7.5) months, respectively. Most patients were taken care by internists 63.8% (n = 102) followed by orthopedists 15.0% (n = 24), surgeons 6.9% (n = 11), gynecologists 6.9% (n = 11), otorhinolaryngologists 5.6% (n = 9) and others 1.9% (n = 3). The prevalence of SHU was 35 (95% CI: 28, 43) % (n = 56); which included gouty arthritis (n = 27), tophaceous gout with or without arthritis (n = 20), renal stone (n = 6), and a combination of gouty arthritis and renal stone, (n = 3). The details of clinical characteristics of the patients with SHU and asymptomatic hyperuricemia (AHU) are shown in Table 1. Patients with SHU were significantly more likely to be male, to have higher SU level, and to have renal insufficiency. SHU patients had history of alcohol drinking more than AHU patients; however, it was not statistically significant, p = 0.067. Only one AHU patient took ethambutol; no one in the study was psoriasis, or taking pyrazinamide or taking cyclosporine.

Male, SU levels or SU > 9 mg/dL and renal insufficiency were significantly associated with SHU as determined by computing univariate analysis (Table 2) while age, diabetes mellitus, dyslipidemia, hypertension, BMI > 25 kg/m^2, low-dose ASA use, or diuretic use were not significantly associated with SHU, p > 0.1. Two models for multivariate analysis were analyzed. Variables of model 1 included sex, SU levels, alcohol drinking and renal insufficiency while SU > 9 mg/dl (yes/no) was substituted for SU levels (continuous data) in model 2. Male and SU level both concentrations (continuous data) or values > 9 mg/dL (dichotomous data) were significantly associated with SHU in both models while renal insufficiency significantly associated with SHU only in model 2 after adjusted the other variables. Alcohol drinking did not have association with SHU in any models.

Management

Most of the patients were evaluated for co-morbid diseases which were blood pressure at 76.0% (n = 122), renal function at 96.9% (n = 155), blood sugar at 78.1% (n = 125) and lipid profile at 65.6% (n = 105). According to medical records, 31.3% (n = 50) of the study patients received advice in relation to HU. The majority of doctors in this group was internal medicine 72.0% (n = 36), followed by orthopedists 16.0% (n = 8). However, when considered by each specialty, patients taken care by internists and orthopedists had

Table 1. Clinical characteristic between patients with asymptomatic and symptomatic hyperuricemia

Demographic data	Asymptomatic hyperuricemia n = 104	Symptomatic hyperuricemia n = 56	p-value
Age, Mean ± SD (years)	56.2 ± 14.1	58.7 ± 13.5	0.267[a]
Male sex, n/N (%)	72/104 (69.2)	50/56 (89.3)	0.004[b]
Serum uric acid, Mean ± SD (mg/ml)	8.35 ± 1.1	9.3 ± 1.6	< 0.0001[a]
Body mass index, Mean ± SD (kg/m^2)	25.3 ± 4.2	24.4 ± 3.0	0.213[a]
Overweight to obese, n/N (%)	47/104 (45.2)	23/56 (41.1)	0.616[b]
Alcohol drinking, n/N (%)	20/104 (19.2)	18/56 (32.1)	0.067[b]
Smoking, n/N (%)	17/104 (16.3)	10/56 (17.9)	0.808[b]
Hypertension, n/N (%)	63/79 (79.7)	35/43 (81.4)	0.827[b]
Dyslipidemia, n/N (%)	57/74 (77.0)	27/33 (81.8)	0.398[b]
Diabetes mellitus, n/N (%)	27/87 (31.0)	7/38 (18.4)	0.145[b]
Renal insufficiency, n/N (%)	21/101 (20.8)	22/54 (40.7)	0.008[b]
Ischemic heart disease, n/N (%)	9/97 (9.3)	2/47 (4.2)	0.504[c]
Cerebrovascular disease, n/N (%)	4/97 (4.1)	3/47 (6.4)	0.683[c]
Low-dose aspirin use, n/N (%)	21/104 (20.2)	8/56 (14.3)	0.355[b]
Diuretic treatment, n/N (%)	13/104 (12.5)	6/56 (10.7)	0.739[b]
Follow-up duration, Mean ± SD (months)	13.8 ± 7.6	15.2 ± 7.0	0.249[a]

n = number with that condition; N = total number included in the analysis; SD = standard deviation;
Renal insufficiency = serum creatinine > 1.5 mg/dl; [a] unpaired t test, [b]chi-square, [c]Fisher's exact test

comparable proportions from whom advice was provided at 35.3% and 33.3%, respectively, the advice given was to reduce alcohol drinking, 23.7% (n = 9), to stop smoking, 25.9% (n = 7), to lose body weight 12.5% (n = 20), to do exercise 10% (n = 16) and to restrict diet 18.1% (n = 29). There was no significant difference in giving the advice between patients with or without SHU (Table 3). However, advice for weight reduction appeared to be provided to both normal and high BMI HU patients but with a higher proportion in patients with BMI > 25 kg/m^2 in both SHU and AHU group with p 0.009 and < 0.0001, respectively.

Regarding pharmacologic management, one hundred and forty (87.5%) HU patients in the present study were correctly managed according to the recommended management. Forty-five patients, 69.7% (n = 39) of SHU and 5.8% (n = 6) of AHU patients, were prescribed for urate lowering agents, allopurinol. No one in this study took other urate lowering drugs. Thirty (66.7%) patients took the medication according to the recommended indications which were arthritis more than 2 times/year, 6 (20.0%), to phaceous gout with or without arthritis, 18 (60.0%), renal calculi, 4 (13.3%), and combination of gouty arthritis and renal calculi, 2 (6.7%). Twenty (12.5%) patients were in appropriately treated. Nine SHU patients were prescribed allopurinol although the patients' history of arthritis was less than 3 times/year; 6 patients were AHU. In addition, 5 patients with SHU had indication of urate lowering agent treatment-renal calculi (n = 2), combination of tophi with or without arthritis (n = 2) and combination of arthritis and renal calculi (n = 1) but they were not

Table 2. Univariate and multivariate logistic regression analyses of risk factors of symptomatic hyperuricemia

Variable	Univariate analysis		Multivariate analysis			
	OR	95% CI	Model 1		Model 2	
			OR	95% CI	OR	95% CI
Male	3.7	1.4, 9.5	3.6	1.3, 10.3	3.4	1.2, 9.4
Serum uric acid (mg/dl)	1.7	1.3, 2.3	1.7	1.2, 2.3	NA	NA
Serum uric acid > 9 mg/dl	4.1	2.1, 8.3	NA	NA	3.6	1.7, 7.7
Alcohol drinking	2.0	1.0, 4.2	1.6	0.7, 3.8	1.6	0.7, 3.6
Renal insufficiency	2.6	1.3, 5.4	2.0	0.9, 4.5	2.3	1.0, 5.0

OR = odds ratio; BMI = body mass index; 95% CI = 95% confidence interval; NA = not analysis

Table 3. Details of patient education recorded in medical records

	Asymptomatic n/N (%)	Symptomatic n/N (%)	p
All education	29 (27.9)	21 (37.5)	0.211[a]
Reduce alcohol drinking	6/20 (30.0)	3/18 (16.7)	1.000[b]
Stop smoking	5/17 (29.4)	2/10 (20.0)	1.000[b]
Reduce body weight	15 (14.4)	5 (8.9)	0.316[a]
BMI > 25 kg/m^2	14/47 (29.8)	5/23 (21.7)	NA
BMI ≤ 25 kg/m^2	1/57 (1.8) (p < 0.0001[a])*	0/33 (0) (p 0.009[b])**	NA
Do exercise	7 (6.7)	9/56 (16.1)	0.060[a]
BMI > 25 kg/m^2	5/47 (10.6)	4/23 (17.4)	NA
BMI ≤ 25 kg/m^2	2/57 (3.5)	5/33 (15.2)	NA
Control diet	15 (14.4)	14 (25.0)	0.098[a]
BMI > 25 kg/m^2	9/47 (19.1)	4/23 (17.4)	NA
BMI ≤ 25 kg/m^2	6/57 (10.5)	10/33 (30.3)	NA

n = number of given that advice; N = total number of that condition; BMI = body mass index;
* comparing between BMI > and ≤ 25 kg/m^2 in asymptomatic hyperuricemic patients;
**comparing between BMI > and ≤ 25 kg/m^2 in symptomatic hyperuricemic patients; [a]chi-square, [b]Fisher's exact test

treated with the medication by internists (n = 2), surgeons (n = 2) and orthopedists (n = 1). Details of urate lowering drug prescribing in HU patients with respect to specialty of doctors are shown in Table 4.

Ninety percent (n = 40) of the patients were prescribed allopurinol, starting with a dosage of 100 mg/day or less and 18 (45%) of these patients had serum creatinine more than 1.5 mg/dL. Twenty nine patients were continuously treated with allopurinol for at least 6 months. Duration of allopurinol treatment was comparable between the patients who had final SU levels ≤ and > 6 mg/dL with median (range) duration of treatment, 16.8 (10-33) months and 18.0 (10-24) months, respectively. Details of final allopurinol dosage regarding renal function and the goal of SU are shown in Table 5.

Discussion

The prevalence of SHU in the present study was 35%. This was much less than Akkasilpa's study[19], which was 93%, although both studies were conducted in a tertiary hospital and a university hospital in Thailand. The previous report studied patients at a rheumatologic clinic where the patients had high probability of having SHU. In contrast, the present study investigated the patients from the whole hospital, so patients with mixed high and low probability of being SHU had a chance to be included. The definition of hyperuricemia in this study was more than 7 mg/dL in both male and female because it was above saturated point in the human body. Hematologic malignancy was excluded from the present study due to being a cause of HU in the younger and usually receiving allopurinol to prevent tumor lysis syndrome. Interestingly, HU patients in the present study had higher proportion of co-morbid diseases when compared to study from general population[1,20]. The prevalence of SHU in this study might represent a special group of high co-morbidities as it was much higher than that in other reports from general population, 0.03-15.2%[21].

Hyperuricemia and gout are usually used as interchangeable term because almost all of hyperuricemic manifestations is gout[19]. Eighty-nine percent (n = 50) of SHU patients in this study had gout,

Table 4. Number of allopurinol prescriptions according to recommended indication and specialty of doctors

Indication	Internal medicine	Surgeon	Orthopedist	ORL	Others
Gouty arthritis > 2 times/year	6	0	0	0	0
Tophi with or without arthritis	13	0	4	1	0
Renal calculi	3	1	0	0	0
Gouty arthritis and renal calculi	1	1	0	0	0
Gouty arthritis < 3 times/year	3	0	6	0	0
Asymptomatic hyperuricemia	5	0	0	0	1
Total	31	2	10	1	1

ORL = Otorhinolaryngologists

Table 5. Last allopurinol dosage of hyperuricemic patients with follow-up duration of more than 6 months according to serum uric acid and renal function

Last allopurinol dosage (mg/day)	Serum uric acid ≤ 6 mg/dL, n = 13		Serum uric acid > 6 mg/dL, n = 16	
	Serum Cr ≤ 1.5 mg/dL	Serum Cr > 1.5 mg/dL	Serum Cr ≤ 1.5 mg/dL	Serum Cr > 1.5 mg/dL
100	1	0	4	1
150	0	0	1	0
200	4	2	4	3
250	0	0	0	1
300	1	5	1	1

n = number; Cr = creatinine

gouty arthritis and/or tophi and 10.7% of these had only renal lithiasis. It has been reported that male, SU, and renal insufficiency associated with gout in HU[5,20,21]. The present study showed that male and SU levels had strongly associated with SHU in both univariate and multivariate analysis with odds ratio (OR) (95% confidence interval, CI) in multivariate analysis of 3.6 (1.3-10.3) and 1.7 (1.2-2.5), respectively. Campion[5] reported that patients with SU > 9 mg/dL were more likely to develop gout than patients with lower levels[5]. SHU patients in the present study had significantly higher proportion of having SU of more than 9 mg/dL than AHU patients (Table 1). Therefore, SU > 9 mg/dL was replaced for SU levels to determine the association with SHU. In the multivariate analysis model 2, male, SU more than 9 mg/dL and renal insufficiency significantly associated with SHU with OR (95% CI) of 3.4 (1.2-9.4), 3.6 (1.7-7.7) and 2.3 (1.0-5.0), respectively. Age and co-morbid diseases (diabetes mellitus, overweight, hypertension and dyslipidemia) had been reported having association with gout and hyperuricemia[1,4]; however, Campion's study showed that age, BMI, hypertension and dyslipidemia were not associated with developing gout after including SU level in analysis[5]. In present study, theses co-morbid diseases did not associate with SHU while SU had a strong association with SHU as in Campion's study[5].

It is recommended to investigate causes and co-morbid diseases when identifying HU and gout. Treatment with both non-pharmacologic and pharmacologic strategies is also suggested although the managements of these were often suboptimal[14,15,22-24]. Most of the patients in this study were evaluated for common co-morbid diseases. Renal function was the most frequent item, 97%, followed by blood sugar 78%, blood pressure 76% and lipid profile 66%. Patient education is important to help achieve the goal of treatment. It has been reported that weight gain, obesity and alcohol drinking (beer, spirits), imbibing fructose and sugar-containing drinks and eating large amount of red meat and seafood are risk factors of gout development[7,8,11,25]. Moreover, weight reduction in overweight patients is a protective factor[7]. In the present study, only 31.3% of HU patients received such advice as identified from medical records; however, this might be under estimated because some physicians did not record anything when giving advice.

Regarding allopurinol prescription in the present study, 33.3% (n = 15) of the patients were prescribed allopurinol without appropriate indication, which was lower than Athisakul's study[15], 43%. Forty percent (n = 6) of those were AHU which was slightly less than allopurinol prescription in AHU patients in UK, 56.7%[14]. Allopurinol should be started at a low dose to reduce the risk of provocation of acute attacks and incidence of toxicity[12]. The goal of urate lowering treatment is curing the disease by preventing urate crystal formation and enhancing crystal dissolution. Therefore, SU should be at or below 6 mg/dL for a long period of time[12]. Almost 90% of the study patients started allopurinol ≤ 100 mg/day. Only 64.4% (n = 29) of the patients conti-nuously took the medication more than 6 months and only 44.8% (n = 13) of those with long term medication reached the goal, SU ≤ 6 mg/dL, which was higher than Singh's report, 20%[26]. The pitfall might be not adjusting and not properly increasing allopurinol dosage as 37.5% (n = 6) of those used stable dosage. Moreover, 57% (n = 8) of those adjusted the medication but they reached the final dosage less than 300 mg/day.

The present study assessed the quality of care in HU patients in Thailand in a broader perspective than previous studies. The authors evaluated not only appropriate allopurinol prescription, starting dosage of allopurinol, and the goal achievement, but also patient education. To our knowledge, there was no study of the quality of care other than medical prescription in Thailand. Non-pharmacologic strategy should be improved to reach the aims of treatment.

There were several limitations in the present study. First, it was a retrospective study. Some information might not be available, for example, alcohol consumption, history of clinical manifestation of hyperuricemia, drug compliance, etc. Therefore, the association of the risk factor and SHU might not be accurate. Moreover, the proportion of giving patient education or prescription allopurinol with approved indications presented in the present study may be less than in real practice because it is not a routine practice to document patient education in medical records. Second, it was a small sample size study, especially regarding the patients on allopurinol treatment. There were not enough patients' to determine the association of appropriate allopurinol treatment and risk factors i.e. specialty of doctor, or renal function. Finally, it was rather a short follow-up duration of allopurinol treatment to determine the success of treatment, SU not more than 6 mg/dL. A larger and long-term prospective studyis needed.

Conclusion

Prevalence of SHU at a university hospital

was quite high. Male and SU concentration were associated with hyperuricemia, while renal insufficiency had a marginal association. Common co-morbid diseases (HT, Hyperlipidemia, impaired fasting plasma glucose-DM, hypertension and renal in sufficiency) were recognized in most patients. The proportion of these patients receiving education as identified from medical records was low. There were quite a high proportion of patients treated without appropriate indication of allopurinol. There was a large opportunity to improve the quality of hyperuricemia care.

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Potential conflicts of interest

None.

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ความชุกและปัจจัยเสี่ยงของการเกิดอาการจากภาวะระดับกรดยูริกในเลือดสูงคุณภาพของการดูแลรักษาผู้ป่วยที่มีภาวะระดับกรดยูริกในเลือดสูงในโรงเรียนแพทย์

ปวีณา เชี่ยวชาญวิศวกิจ, อภิรดี ทวีสุข, วันรัชดา คัชมาตย์, วราลักษณ์ ศรีนนท์ประเสริฐ

วัตถุประสงค์*: เพื่อประเมินความชุกและปัจจัยเสี่ยงของอาการจากภาวะระดับกรดยูริกในเลือดสูงและประเมินอัตราส่วนของผู้ป่วยที่ได้รับคำแนะนำในการปฏิบัติตัวและการสั่งยาลดระดับกรดยูริกได้ถูกต้องตามข้อบ่งชี้*

วัสดุและวิธีการ*: การศึกษานี้รวบรวมผู้ป่วยรายใหม่ของโรงพยาบาลศิริราชในปี พ.ศ. 2552 และมีภาวะระดับกรดยูริกในเลือดสูงจำนวน 160 ราย โดยทบทวนประวัติและการรักษาจากเวชระเบียน และเก็บข้อมูลพื้นฐาน ปัจจัยเสี่ยงของภาวะระดับกรดยูริกในเลือดสูงที่มีรายงานและการรักษา ผู้ป่วยที่ได้รับการวินิจฉัยว่ามีอาการจากระดับกรดยูริกในเลือดสูงหรือได้รับยาลดกรดยูริกก่อนที่จะเป็นผู้ป่วยใหม่ที่โรงพยาบาลศิริราชหรือได้รับการวินิจฉัยว่าเป็นโรคมะเร็งระบบเลือดจะถูกคัดออกจากการศึกษาใช้ logistic regression ประเมินปัจจัยเสี่ยงของการมีอาการจากภาวะระดับกรดยูริกในเลือดสูง*

ผลการศึกษา*: ผู้ป่วยที่ศึกษาเป็นเพศชายร้อยละ 76.3 มีอายุเฉลี่ย (ค่าเบี่ยงเบนมาตรฐาน) 56.5 (14.7) ปี และติดตามการรักษาเฉลี่ย 14.5 (7.5) เดือน พบความชุกของอาการของภาวะระดับกรดยูริกในเลือดสูง ร้อยละ (ค่าความเชื่อมั่นร้อยละ 95) 35 (28-43) ซึ่งเกาต์เป็นอาการที่พบบ่อยที่สุด ร้อยละ 89 ปัจจัยเสี่ยงที่สำคัญทางสถิติจาก univariate analysis คือ เพศชาย ระดับกรดยูริกในเลือดสูงมากกว่า 9 มิลลิกรัม/เดซิลิตร และการทำงานของไตบกพร่อง โดยมีค่าอัตราส่วนเสี่ยง (ค่าความเชื่อมั่นร้อยละ 95) เท่ากับ 3.7 (1.4-9.5), 4.1 (2.1-8.3) และ 2.6 (1.3-5.4) ตามลำดับ ปัจจัยเหล่านี้ยังคงมีนัยสำคัญทางสถิติกับการมีอาการของระดับกรดยูริกในเลือดสูงจาก multivariate analysis โดยมีค่าอัตราส่วนเสี่ยง 3.4 (1.2-9.4), 3.6 (1.7-7.7) และ 2.3 (1.0-5.0) ตามลำดับ ผู้ป่วย ร้อยละ 31 ได้รับคำแนะนำในการปฏิบัติตัว โดยแนะนำให้ลดการดื่มแอลกอฮอลล์ ร้อยละ 24 หยุดสูบบุหรี่ ร้อยละ 26 ลดน้ำหนัก ร้อยละ 13 ออกกำลังกาย ร้อยละ 10 และควบคุมอาหาร ร้อยละ 18 ผู้ป่วยที่ได้รับสั่งยาลดกรดยูริกได้ถูกต้องตามข้อบ่งชี้มีจำนวน 30 รายหรือร้อยละ 67*

สรุป*: อาการจากระดับกรดยูริกในเลือดสูงพบได้บ่อยในโรงเรียนแพทย์ เพศชายและระดับกรดยูริกมีความสัมพันธ์อย่างมีนัยสำคัญทางสถิติกับการมีอาการจากระดับกรดยูริกในเลือดสูงขณะที่การทำงานของไตบกพร่องมีแนวโน้มว่าจะมีความสัมพันธ์ผู้ป่วย ร้อยละ 31 ได้รับคำแนะนำในการปฏิบัติตัวและผู้ป่วย ร้อยละ 67 ได้รับยาลดกรดยูริก เหมาะสมตามข้อบ่งชี้การดูแลรักษาผู้ป่วยที่มีภาวะระดับกรดยูริกในเลือดสูงยังมีโอกาสในการพัฒนา*