

PRESCRIPTION PATTERN OF GOUT: A PROSPECTIVE STUDY

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ABSTRACT

Gout is a common metabolic disorder which occurs due to excessive deposition of uric acid in different bone joints. The incidence of gout has also risen rapidly in Nepal in the past decades. Men are three times more likely than women to develop gout. It tends to affect men after age 40 and women after menopause. The aim was to study the prescription pattern of gout drugs in gouty outpatients in Crimson Hospital, Manigram, Rupandehi. Hospitalized and patient below 20 years of age were excluded from the study. A total of 110 cases were included in the study. The result of this study shows that most of the gout patients were male in comparison to female and fell under the age group from 40-49 years (37.27%) followed by 50-59 year age group (25.45%). It was found that alcohol consumers patient was more in number than smokers and tobacco consumers. Brahmin patients (43.64%) were mostly diagnosed with gout in comparison to other races. In occupation wise distribution most of the gout patients were business (25.45%) followed by service (19.09%). In our study, hypertension (28.18%) shows the highest diagnosis of diseases in patient with gout. Combination therapy is more common than mono-therapy. Combination of three drugs is most frequently used among the patients. Most of the prescribed gout drugs were Febuxostat along with NSAIDs and Proton Pump Inhibitors (Pantoprazole) followed by Colchicine with NSAIDs and Pantoprazole. Oral route was mostly preferred rather than intravenous routes.

KEYWORDS: Gout drugs, Urate Lowering Therapy, Prescription, Prescription pattern, chronic kidney disease.

INTRODUCTION

In the general population, the prevalence of gout varies worldwide from 0.1% to approximately 10% and incidence rates vary from 0.3 to 6 cases per 1,000 person-years.^[1] Anton van Leeuwenhoek described the microscopic appearance of uric acid crystals in 1679. The word gout was initially used by Randolph's of Bocking, around 1200 AD. It is derived from the Latin word gutta, meaning "a drop" of liquid.^[2] Gout is the most common form of inflammatory arthritis and can be characterized by hyperuricemia, arthropathy, tophus development, urolithiasis and is associated with increased risk of cardiovascular and chronic kidney disease.^[3] Some of the risk factors for gout are harmful use of alcohol, obesity, renal failure, unhealthy diets, hypertension, diabetes, hyperlipidemia.^[4] Swollen, red and extremely painful joint are the sign and symptoms of gout. Life style changes such as dietary modification, weight loss, reduction of alcohol consumption play important role in

management of gout.^[5] Historically, gout has been referred to as "the king of diseases and the disease of kings" or "rich man's disease". Metatarsal-phalangeal joint at the base of the big toe is the most commonly affected.^[2] In gout deposition of monosodium urate or uric acid crystals occurs in synovial fluid, other tissues and methods to lower these urate levels are by reducing production and by increasing urinary excretion of uric acid.^[6] Hyperuricemia is the major risk factor for developing gout. Conditions leading to hyperuricemia are obesity, diuretic use and renal failure. Gout was more common in male as compared to female.^[7] Gout is linked to metabolic syndrome and obesity.^[8] Medical comorbidities such as heart disease, hypertension, diabetes mellitus, heart failure, apnea, hypothyroidism are more common in patients with gout compared to those without gout. Gout remains mis-understood, underdiagnosed and underrated despite various recommendation and guidelines in the management of

gout.^[9] Generally, involvement of the first metatarsophalangeal joint is the hallmark of gout.^[10] The incidence of gout has increased in recent decades leading to increased health care burden. Non-steroidal anti-inflammatory drugs (NSAID's), colchicine and corticosteroids are used to treat gout. Urate lowering therapy (ULT) are usually given to patient who have recurrent attack that decreases the level of serum uric acid in blood.^[11] Lowering serum uric acid is the fundamental target of the treatment of gout.^[5] Due to easy and well understood pathogenesis, gout is most manageable among all common rheumatic diseases. Hyperuricemia and gout are the possible risk factor for the progression of Chronic Kidney Disease and treatment with urate lowering therapy reduces the progression of kidney Disease.^[12] Appropriate medication can improve the quality of life and the goal of gout flare treatment is pain relief by the reduction in inflammation and reduction in crystal dissolution.^[10] Natural treatments such as cherry extract and cherry juice are used by patient of gout which are used to lower gout flare rate.^[13] Since, diet plays a significant role in the pathophysiology of gout. Thus, diet modification is an important behavioral approach to gout management. Gouty arthritis and tophi may cause chronic disability, increase health care resources, reduce productivity and impair health-related quality of life.^[9] More recently, a novel drug febuxostat has been introduced as it is a potent xanthine oxidase inhibitor with minimum effects on enzymes involved in purine and pyrimidine metabolism.^[6] Gout medicines are key element in preventing and treating gout. Urate lowering therapy (ULT) decreases the deposition of serum uric acid in blood and NSAID's are used to relief from pain and inflammation in patient developing gout. Gout medicines are used to slow the progress of the gout or treat symptoms in patients who have gout.^[11]

OBJECTIVE

General objective

To study, the prescription pattern of gout drugs in outpatient in Crimson Hospital.

Specific objective

- i. To study the number of drugs dispensed according to prescription.
- ii. To study about pattern of prescribed gouty drugs.
- iii. To study the demographic of gout patients.
- iv. To study the prescribed gouty drugs as per WHO core indicators.

METHODOLOGY

Study site

The study was conducted at Crimson hospital which is located in Manigram and provides health services to Rupandehi and other surrounding district like Gulmi, Palpa, Kapilvastu, Nawalparasi and other districts.

Study type

This is prospective observational study.

Duration of study

The study was conducted for six months (April - September, 2021).

Population size

Total 110 patients were enrolled in this study.

Patient selection

Inclusion criteria

- ✓ Patients of age group between 20-90 years.
- ✓ Both the sex was included in this study.
- ✓ Patient with sign and symptoms of gout along with drug therapy with the disease.

Exclusion criteria

- ✓ Age of patients above 90 and below 20.
- ✓ Hospitalized patients were excluded from this study.
- ✓ Patients with no sign and symptoms of Gout.

Materials

Patient profile form

This was developed manually by the researchers. The dully filled form contains patient demography data like name, address, age, gender, occupation, education, marital status, medication history, medical history, diagnosis, dosage form, dosage and duration.

Assessing the prescription

Prospective data from patient medical cardex records with at least one drug along with supportive medications were obtained with regard to age, and prescribed. A total of 110 prescriptions were collected, observed and recorded.

Data evaluation

Patient Medical Record obtained during data collection was evaluated in MS-excel. All the Information collected regarding the Prescription pattern of drugs used in gout in the medication record including the study of demographic characteristic, study about pattern of prescribed gout drugs, essential drug prescribed, and study of prescribed gout drugs as per WHO core indicators.

RESULT

Age-wise distribution of patients

Altogether 110 patients were included in this study. The age distribution of the patient is given in table 1. At present study, most of gout patient from age group 40-49 years (37.27%) followed by 50-59 year age group (25.45%) . The mean average is 45.95 and standard deviation is ± 12.55 .

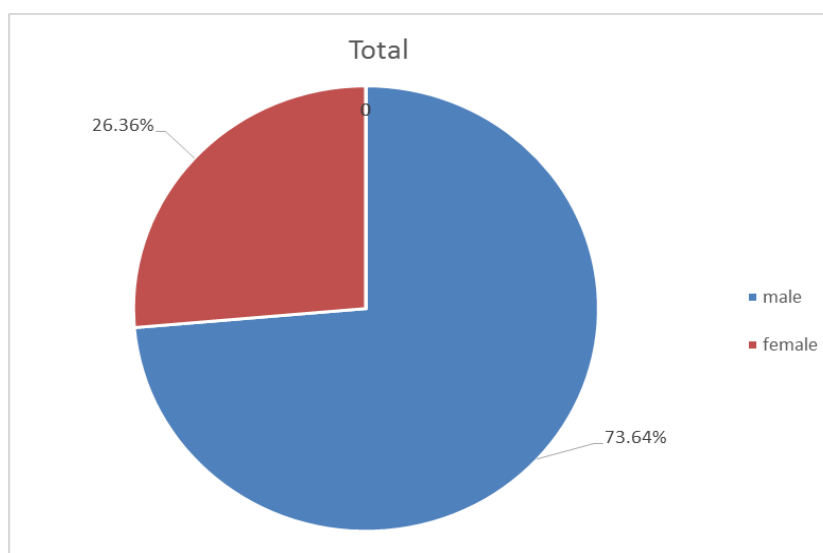
Table 1: Age distribution of the patients (n=110).

Age group	Number of patients (N)	Percentage (%)
20-29	11	10
30-39	19	17.27
40-49	41	37.27
50-59	28	25.45
60-69	6	5.45
70-79	3	2.73
80-89	2	1.82
Total	110	100.0

Gender-wise distribution of patients

The majority of patient in the study were male (73.64 %) and less number of patient were female (26.36%). The

Gender wise distribution of the patients is given in the figure 1.

**Figure 1: Gender-wise distribution of patients.****Occupation wise distribution of patient**

The occupation wise distribution of patients is given in the table 2.

Table 2: Occupation wise distribution of patients.

Occupation	Number of patients (N)	Percentage (%)
Housewife	13	11.82
Shopkeeper	14	12.73
Farmer	12	10.91
Business man	28	25.45
Teacher	6	5.45
Service	21	19.09
Others	16	14.55
Total	110	100.0

It was found that most of the gout patients were Business man (25.45%) compared to others.

Racial distribution of patients

The detail of racial distribution study patients are given in the figure 2.

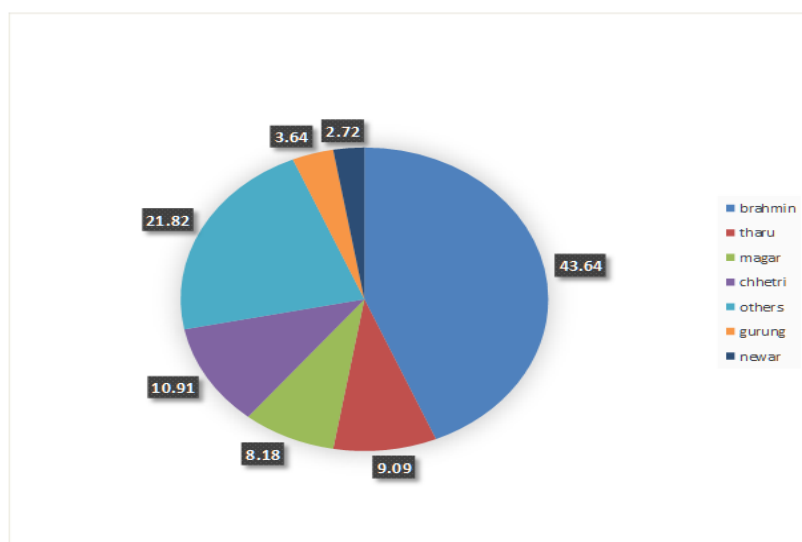


Figure 2: Racial distribution of patients.

In our study we found that 43.64% were Brahmin followed by Chhetri (10.91).

Social history wise distribution of patient

The social history wise distribution of patients is given in the figure 3.

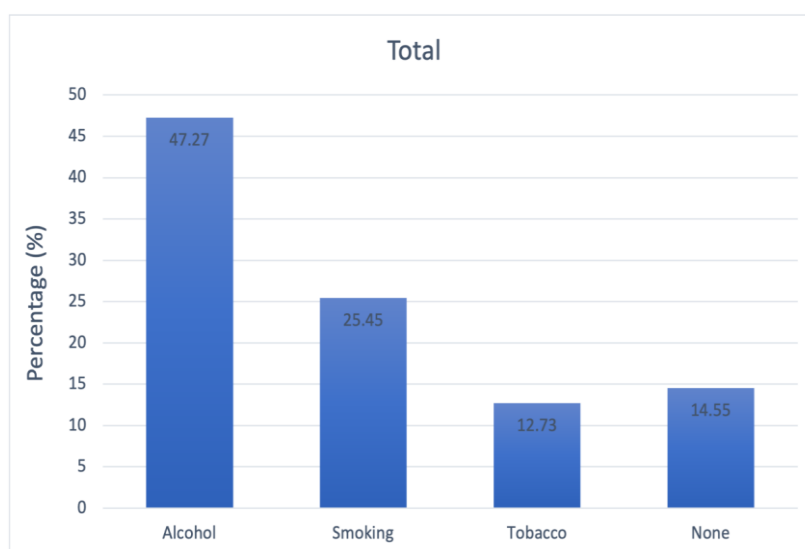


Figure 3: Social history wise distribution.

In our study the people with history of alcohol consumption (47.27%) is the highest number followed by the people with smoking (25.45%) and tobacco consumption (12.73%).

Medical history wise distribution of patients

The medical history wise distributions of patients are given in figure 4. Medical history was evaluated and is presented in percentage. Hypertension was found to be the most among the patients.

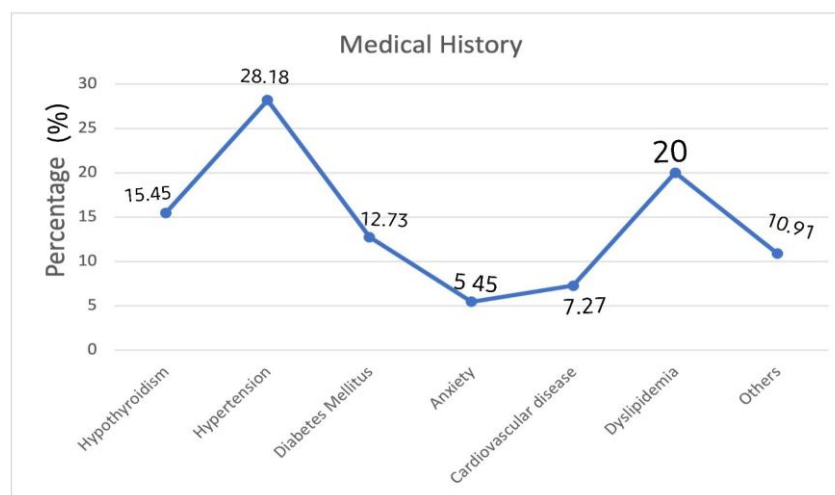


Figure 4: Medical history wise distribution of patients.

Pattern of drug prescribed in gout

The pattern of drugs prescribed drug is given in the table 3.

Table 3: Combination of drug given in the gout.

S.N.	Combination of drugs	Number of patients (N)	Percentage (%)
1.	Allopurinol + NSAIDs + Pantoprazole + Sulfinpyrazone	13	11.82
2.	Febuxostat + NSAIDs + Pantoprazole	37	33.64
3.	Colchicine + NSAIDs + Rabeprazole	24	21.82
4.	Febuxostat + Colchicine + Pantoprazole + NSAIDs	7	6.36
5.	Febuxostat + NSAIDs + Methylprednisolone + Rabeprazole	10	9.09
6.	Colchicine + NSAIDs + Methylprednisolone + Pantoprazole	8	7.27
7.	Febuxostat + NSAIDs + Calcium + Pantoprazole	11	10
Total		110	100

Types of NSAID's Prescribed in Gout

Types of NSAID's prescribed in gout patient is given in the table 4.

Table 4: NSAID's prescribed in gout patients.

S.N.	NSAID's	No of patient
1.	Indomethacin	36
2.	Aceclofenac	28
3.	Naproxen	26
4.	Ibuprofen	12
5.	Others	8
Total		110

In our study Indomethacin is mostly prescribed NSAID's in gout patient followed by Aceclofenac and so on. Others include Diclofenac and Eterocoxib.

DISCUSSION

In our study, total 110 number of patients were enrolled in which the highest number of patients were male (73.63%) as compared to female (26.36%). Our study showed that incidence of gout is more in male than in female while diagnosing gout. The similar type of study was done in Eastern India and found that 93.33% male and 6.67% female were affected with gout.^[10] Men are

most commonly affected due to several factors like drinking alcohol, metabolic diseases, toxic chemical, use of certain drugs including diuretics, low dose aspirin.^[2] At present study, gout disease patient was from age group of 40-49 years (37.27%) followed by age group of 50-59 years (25.45%), then age group 30-39 years (17.27%) and 20-29 years (10%) and so on. The least number of patients were from age group 80-89 years (1.82%). Mean average age is 45.95 and standard deviation is ± 12.55 . In a similar study conducted in Kathmandu, found that maximum number of patients were from age group 40-49 years (28.5%) followed by age group 50-59 years (16.5%) and others.^[4] In our study, we found that Brahmin races were 43.64%, followed by Chhetri (10.91%) and so on. In case of occupation wise distribution of patients, the highest number of patients was found to be Business man (25.45%) followed by service (19.09%). The percentage of business man was highest due to their life style, increased health care burden, lack of exercise, obesity, taking food rich in purine such as red meat, pulses etc. In a similar study conducted in Bangladesh, found that maximum number of patients were employed (42%) and involved in some kind of business (24.66%).^[2] In our study, 85.45 % patients had social history. Among them 47.27% patients were addicted to alcohol, 25.45%

patients were addicted to smoking and 12.73% patients were addicted to tobacco. The proportion of alcohol consumers (47.27%) and smokers (25.45%) were higher than tobacco consumer. In a similar study conducted in USA, the alcohol intake or same kind of beverages consumed was associated with increased risk of recurrent gout attack. The effect period of alcohol was short likely to occur within the first 24 hours after alcohol consumption.^[15] Mostly gout patient are suffered from other diseases. We had found that gout patients were suffered from diseases like Dyslipidemia (20%), Hypertension (28.18%), Hypothyroidism (15.4%), Anxiety (5.45%), DM (12.73%) etc. Among them hypertensive patients (54.22%) were diagnosis as highest in gout patients. Elevated serum uric acid level and metabolic syndrome is associated with increased risk of developing hypertension.^[16] In a study conducted in united kingdom, anti-hypertensive drugs such as diuretics increase the net reabsorption of uric acid in proximal tubule of nephron and thereby reduce urinary excretion and Beta blockers increase the serum uric acid level which supports our study.^[17] During our study, the patients suffering from gout were suggested for various dietary restrictions such as red fleshy meat, fish, pulses, alcohol, sour and spicy food. Patients were also recommended to drink plenty of water and do daily exercises and yoga for their better health. Similar study was conducted in Nobel Medical College in which out of 384 patients, 67.7% patients were suggested to remain on dietary restriction such as Purine rich diets and Alcohol.^[9] In our study most of the patient have suffered at least one attack of acute gout. The drug used to treat or manage gout includes usually urate lowering therapy (ULT), NSAID's and pain-relieving drugs. Pantoprazole is most commonly used proton pump inhibitors (PPI's). Among NSAID's, indomethacin is used in highest patients. Combination therapy is more common than mono-therapy. Combination of three drugs is most frequently used among the patients. Majority of patients were treated with febuxostat along with NSAID's and pantoprazole (33.64%) followed by colchicines along with NSAID's and Pantoprazole (21.82%). Similarly, Allopurinol and Sulfapyrazone with NSAID's and Pantoprazole (11.82%) and also (10%) patient with Febuxostat, NSAIDs, Calcium and Pantoprazole. (9.09%) with Febuxostat, NSAIDs, Rabepazole and Methylprednisolone, (7.27%) with Colchicine, NSAIDs, Pantoprazole and Methylprednisolone, (6.36%) with Febuxostat, Colchicine, NSAIDs and Pantoprazole. In similar study conducted in Nobel Medical College and Manmohan Memorial Medical College and teaching hospital, the first line ULT i.e. Allopurinol was prescribed for only few patients whereas second line ULT i.e., Febuxostat was prescribed to 60 patients.^[9] At present study, Febuxostat is most widely used and might have been preferred to allopurinol due to its potent inhibitor of xanthine oxidase, greater hypouricemic activity, few drug interaction, minimal propensity to cause allopurinol hypersensitivity syndrome, the dose adjustment is usually not necessary in case of mild to

moderate liver or renal insufficiency or advanced age and also due to superior urate lowering efficacy.^[9]

CONCLUSION

In conclusion, the result of this study shows that most of the gout drugs are used in the treatment of gout diseases in gout patients. During our study most of the patients were male. It is found that gout mostly occurs between 40-49 age groups. Patient addicted to alcohol had high incidence to attack gout. We have found that, most of gout patient are involved in their own business. In our study we found that most of the patients were diagnosed with hypertension followed by hyperlipidemia and hypothyroidism. We have found that doctor prescribed three numbers of drugs to large number of patients. In our study we found that in some patients of gouty arthritis, both Colchicine and Febuxostat are being prescribed during attack of gouty arthritis. In our study, Febuxostat along with NSAIDs and Pantoprazole are given to highest number of patients. Also, among the gout drugs tablet Febuxostat were given to large number of patients followed by Colchicine, Allopurinol and so on. Dietary advice is also given to patients who were suffering from gout attack and not to take pulses, red meat, purine rich diet and drink plenty of water.

The study showed that combination therapy is prescribed rather than the mono-therapy and high numbers of potent drugs are given to the patients. By minimizing the prescription of branded drugs, patient's quality care can be obtained and economic burden can be reduced to the patients. The findings of our study may contribute to understanding of disease pattern; add to provide the cost effective and quality of medicine to be prescribed in future in our country Nepal.

Limitation

The major limitation is the follow up patients unlike other studies which had followed up patients for long period of time. Since the study was conducted only in one hospital so the result may not be accurate. By analyzing more number of cases in different hospital the result may be more accurate. Another limitation was the worldwide pandemic (COVID-19) did occur during our study that lead to the difficulty in creating communication with the patients and extracting the information.

REFERENCES

1. Mohammed E, Bowne LD, Kumar AUA, Adeeb F, Stack AG. Prevalence and treatment of gout among patient with chronic kidney diseases in Iris health system: A National Study. PLoS ONE, 2019; 14(1): e0210487.
2. Parvin N, Uddin R, Chowdhury SA, Islam SMA. Pattern and treatment of gout in Bangladesh: a Hospital based survey at Dhaka city, Bangladesh. Journal of Applied Pharmaceutical Science, 2012; 02(05): 49-51.

3. White WB, Saag KG, Becker MA, Borer JS, Gorelick PB, Whelton A, et al. Cardiovascular safety of febuxostat or allopurinol in patient with gout. *The New England Journal of Medicine*, 2018; 378(13): 1200-1210.
4. Thapa S, Upadhya N, Gautam S. Study of risk factor, prescription pattern and cost estimation of acute gout in private hospital. *Journal of Pharmaceutical Research*, 2015; 4(12): 902-912.
5. Sheng F, Fang W, Zhang B, Zeng X. Adherence to gout management recommendation of Chinese patient. *Medicine*, 2017; 96:45(e8532).
6. Singal KK, Goyal S, Gupta P, Aggawal BK. Comparison Between Allopurinol and Febuxostat in management of gout patient: a prospective study. *Bangladesh Journal of Medical Science*, 2011; 10(4): 257-259.
7. Keenan RT, O'Brien WR, Lee KH, Crittenden DB, Fisher MC, Goldfarb DS, et al. Prevalence of contraindications and prescription of pharmacologic therapies for gout. *The American Journal of Medicine*, 2011; 124(2): 155-163.
8. Singh JA. Gout and comorbidity: a nominal group study of people with gout. *Singh Arthritis Research & Therapy*, 2017; 19(204): 1-13.
9. Sapkota B, Chaudhary S, Gurung P, Humagain A, Sapkota S. Dosage individualization proposed for anti-gout medications among the patients with gout. *PLoS ONE*, 2020; 16(9): 1-19.
10. Rashid N, Levy GD, Wu Y, Zheng C, Koblick R, Cheetham TC. Patient and clinical characteristic's associated with gout flares in an integrated health care system. *Rheumatology International*, 2015; 35: 1799-1807.
11. Srinath R, Marwaha V. Audit of Prescriptions of gout and Hyperuricemia: A three center study from eastern India. *India Journal of Applied Research*, 2017; 8(6): 122-125.
12. Mohammed E, Bowne LD, Kumar AUA, Adeeb F, Stack AG. Prevalence and treatment of gout among patient with chronic kidney diseases in Iris health system: A National Study. *PLoS ONE*, 2019; 14(1): e0210487.
13. Singh JA, Shah N, Edwards NL. A cross-sectional internet based patient survey of the management strategies for gout. *BMC Complementary and Alternative Medicine*, 2016; 16(90): 1-9.
14. Zhang Y, Woods R, Chaisson CE, Neogi T, Niu J, Hunter D, et al. Alcohol Consumption as a trigger of recurrent gout attacks. *The American Journal of Medicine*, 2006; 119(9): 800.e13-800.e18.
15. Ali N, Mahmood S, Islam F, Rahman S, Haque T, Islam s, et al. Relationship between serum uric acid and hypertension: a cross-sectional study in Bangladesh adults. *Scientific Reports*, 2019; 9: 9061.
16. Choi HK, Soriano LC, Zhang Y, Rodriguez LAG. Antihypertensive drugs and risk of incident gout among patients with hypertension: population based case-control study. *British Medical Journal*, 2012; 344: 1-9.