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STUDY OF RISK FACTORS, PRESCRIPTION PATTERN AND COST ESTIMATION OF ACUTE GOUT IN A PRIVATE HOSPITAL

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ABSTRACT

The principal objectives of this study were to determine the prescribing pattern, risk factors and cost estimation of the drugs commonly employed to treat acute gout in Nepal. Acute gout is one of the most common rheumatic diseases in the world. The incidence of gout has also risen rapidly in Nepal in the past decades. A prospective and descriptive study was conducted to assess the risk factors of acute gout, prescribing patterns and cost estimation of drugs used to treat acute gout in patients receiving treatment at nepal Arthritis and Rheumatic Diseases Treatment Center, Jawlakhel, Nepal over a period of three months (July 2015 -September 2015).A total of 103 cases were studied. Hospitalized patients were excluded from this study. The results revealed that majority of the patients were males and fell under the age group 40-49 years. The majority of patients were alcohol consumers (62.1%), consumers of purine rich diet (84.5%), and hyperlipidemia (33%), hypertensive (6.8%).38.8% of the patients had family history of gout. Combination therapy was more common than mono-therapy. The combination of two drugs (60%) was used most frequently amongst the patients. Majority of the patients were treated with the combination of colchicine and febuxostat (53%).The average cost of the drugs per month was Rs 600.

KEY WORDS: Hyperuricemia, gout, acute gout, risk factor.

INTRODUCTION

Gout is the most common form of inflammatory arthritis and is one of the most rapidly increasing health problems worldwide. Several studies have shown that the prevalence and incidence of gout has risen in the last few decades.[1] Gout has become an increasingly

challenging medical problem due to its rising prevalence and comorbidities associated with it .A renewed interest is seen in gout as it has been recognized as a potentially harmful cardiovascular risk factor. Gout affects at least 1% of the western population and is the most common form of inflammatory joint disease in men above 40 years of age.[2]

Both modifiable and non-modifiable risk factors have come forward as the leading cause of increments in the number of cases of gout in the recent years. The increasing prevalence of gout worldwide indicates that there is an urgent need for improved efforts to identify patients with hyperuricemia early in the disease process, before the clinical manifestations of gout become apparent.[3]

Gout is a clinical syndrome which is characterized by the increase in the serum uric acid levels (sUA) which leads to the formation of mono sodium urate crystals. These crystals get deposited in the joints and lead to inflammation and painful attacks. These crystals get deposited in the synovial fluid, cartilages or other joints.[4,5] The loss of uricase activity in human beings along with the reabsorption of uric acid leads to the rise in serum uric acid level (sUA).Higher levels of serum uric acid can be considered as the primary causative factor of gout in human beings.[6]

Epidemiological evidences from developed countries like the USA, UK, and China have shown that gout has been increasingly on the rise. Different studies carried out in these countries have shown that gout has become more prevalent. In developing countries like Nepal gout is steadily on the rise and may become one of the most challenging health problem in future.[7]

Acute gout is characterized by the sudden onset of intense pain and swelling of one or more joints, reaching a maximal level of severity within hours and usually resolving over 10-14 days. It manifests as a sudden onset of severe inflammation in a small joint (The most common joint is Meta tarso-phalangeal joint of great toe) due to precipitation of urate crystals in the joint space. The joint becomes red, swollen and extremely painful and requires immediate treatment.[8]

This type of gout usually involves one joint (often the toe) or a few joints. It presents itself as self-limiting flares of synovitis. Early attacks usually subside after three to 10 days, with some skin peeling away from the affected joint. Without proper treatment, an attack can last

longer. Over time the attacks may become more frequent, last longer, and involve more joints. The first clinical phase of gout is characterized by intermittent acute attacks that spontaneously resolve, typically over a period of 7to 10 days, with asymptomatic periods between attacks.[5, 9]

MATERIALS AND METHODS

Materials

Data collection forms (Questionnaire) Patient medication record.

Study Site

This study was carried out at Nepal Arthritis and Rheumatic Disease Treatment Center (NARDTC) Kathmandu, Nepal.

Study Design

This was a prospective and descriptive hospital based study on study of risk factors of acute gout, prescribing pattern and cost estimation of drugs used to treat acute gout.

Study Site and duration

This study was carried out at Nepal Arthritis and Rheumatic Disease Treatment Center (NARDTC) Kathmandu, Nepal. This study was carried out for a period of 3 months starting from July 2015-September 2015.

Source of data

Direct interaction with the patient who came for treatment in the hospital during the study period and their medication records.

Sampling Technique and Sample Size

The sampling technique was non-randomized sampling. The samples were collected according to the set inclusion criteria. The sample size was 103.

Criteria for selection of patients

- **Inclusion Criteria:** Patients with acute gout were eligible for this study.
- **Exclusion Criteria:** Hospitalized patients were excluded from this study.

Patients who refuse to give consent were excluded. Missing or incorrect data were excluded.

Statistical Analysis

The results were analyzed statistically using Microsoft Excel 2007.

Ethical Consideration

Approval and permission from the concerned hospital and approval from NMCAL was taken before the study. The identity of the patient and any information that might cause any harm to the patient was not disclosed. All the research activities were carried out under the supervision and guidance of supervisor.

RESULT AND DISCUSSION

A total of 103 patient data sheets were enrolled in this study for the desired purpose that is study of prescription pattern, risk factors and cost estimation of drugs used to treat acute gout in a private hospital.

Gender distribution of patients

The majority of patients in this study were males (95%) as compared to females (5%). This study showed that the incidence of acute gout was more in males (95%) than in females (5%).Studies show that the majority of the patients are male while diagnosing acute gout.[2, 8,11]

Mostly the females are affected later in their age i.e. in post-menopausal stage. This may be due to the fact that the uricosuric effect of estrogen is progressively lost after the onset of menopause in females. However the sex ratio decreases 3:1 with increasing age. With increasing age studies show that the increase in the cases of female patients is also seen.[3]

The finding of this study was similar to the study conducted by Annemans et al in which the prevalence of gout was seen in more males than females. Over 80% of the patients were found to be male in this study which is similar to the result of this study as well.

The finding of this study was also similar to The National Health and Nutrition Examination Survey 2007–2008 a study conducted in the USA which revealed that the number of male patients affected by gout were more than the female patients.[11]

Age Distribution of patients

Maximum number of patients were from age group 40-49 years, 40(38.8%), followed by age group 50-59 years, 17(16.5%), then age group 30-39 years and 60-69 years, 16(15.5%), and

so on as shown in the graph below. The least number of patients were from the age group 80-89 years, 3(2.9%).

In a study conducted by Nan et al gout was seen more in the patients who were below 55 years old which is similar to the result of this study. The findings of this study are similar to the study conducted in Great Britain showed that the maximum number of cases of gout fell in the age category 45-64. [12] The findings of this study are similar to a study conducted in the Seychelles which revealed that the maximum numbers of patients were from the age group 45-54 years.

Risk Factors

Out of 103 patients 6.8% patients were found to be hypertensive and 33% were found to be hyperlipidemic. Alcohol consumption was seen in 62.1 % of patients and consumption of purine rich diet was done by 84.5 % of patients. In this study 38.8 % of patients were found to be with family history of gout.

The major factors which are contributing to the rise in the incidence of acute gout are mainly lifestyle factors which include diet and alcohol consumption. However various studies suggest that purine rich diet can hardly be blamed for the risk of gout. Modifications in the lifestyle factors act as an adjunct to the drug therapy. According to various studies high consumption of purine-rich diet which includes beer, red meat are associated with the increase in serum urate levels however the effect of protein and purine rich vegetables on serum urate level have been exonerated. Studies have also found out the positive effect of dairy intake on gout patients. Dairy products, vegetables, nuts, legumes, fruits (less sugary ones), and whole grains are healthy dietary choices for gout and are likely to help prevention of gout by reducing insulin resistance and thus inducing urinary uric acid excretion.[13] Traditionally recommended strict no-purine diet can be very tiresome to patients so proportionate intake of macronutrients can also be very effective.[14]

Alcohol consumption, whether heavy or moderate, is largely responsible for triggering recurrent gout attacks. Irrespective of the type of alcoholic beverages alcohol consumption triggers gout attacks. A dose-response relationship is seen in the first 24 hour of alcohol consumption. Alcohol consumption was also seen very frequent in this study. Results from a survey conducted in the USA (Health Professionals Follow-up Study) showed that alcohol consumption and the risk of gout are strongly associated.[15] Family history of gout is a

suggestive potential risk factor for gout. Results from a case control study conducted in Taiwan by Lyu et al showed that mostly the patients suffering from gout had a history of the disease in their family. Similarly results from another study conducted by Chen et al showed that family history is also responsible for increasing the risk of gout.

Hypertension is also one of the major risk factors of gout. In this study only 6.8% of the study population was seen to be hypertensive. Results of a study conducted BY Choi et al in the UK showed that hypertension is one of the most common comorbidities of gout. Anti-hypertensive drugs especially diuretics and β-blockers are associated with the risk of gout. Hypertension is seen in about 74% of the patients with gout. Hyperlipidemia was seen amongst 33% of patients in this study. Results of a study conducted in Taiwan showed that 32% of the study population had hyperlipidemia which is similar to the result of this study. Usually hypertriglyceridemia is reported in between 25% and 60% of patients with gout.[16]

PRESCRIPTION PATTERN

This study showed that the combination of two drugs was prescribed in maximum number i.e. 62(60%) followed by the combination of three drugs i.e. 32(31%). The combination of colchicine and febuxostat was given to highest number of patients i.e. 50(53%), followed by the combination of colchicine, febuxostat and prednisolone i.e. 28(30%).

The goal of therapy is rapid resolution of pain and inflammation. Non-steroidal anti-inflammatory drugs (NSAIDs) are the treatment of choice in most patients with acute gout who are otherwise healthy.[17] In this study patients are mainly treated with xanthine oxidase inhibitors along with low dose colchicine and oral corticosteroids such as Prednisolone (30 mg). The drugs prescribed were in oral dosage forms. In a study conducted by Kuo et al in Taiwan, among patients who received ULT treatment for gout, 60.08% received uricosuric agents alone, 28.54% received a xanthine oxidase inhibitor and 11.38% received both. However in this study it was found that mostly patients were prescribed xanthine oxidase inhibitors such as allopurinol and febuxostat rather than uricosuric drugs. In this study the combination of two drugs were prescribed the most as suggested by another study conducted in the USA which says that combination treatment was used by 64% of rheumatologists. This result is similar to the result of this study.[4]

Colchicine was the most prescribed drug during an acute attack according to a Colchicine was the most prescribed drug in this study along with xanthine oxidase inhibitors. Several

studies showed that colchicine was the most prescribed agent in the treatment of acute gout.[4] Patients with no co-morbidities were more likely to be prescribed colchicine, allopurinol and corticosteroids or the combinations of these drugs which is similar to the result of this study.[18]

The finding of this study also revealed that febuxostat was prescribed more than allopurinol. According to different studies conducted by Becker et al and Schumacher et al the result showed that febuxostat, at a daily dose of 80 mg or 120 mg, was more effective than allopurinol at the commonly used fixed daily dose of 300 mg in lowering serum urate. Febuxostat showed superior ability to allopurinol in many clinical trials.

Corticosteroids such as prednisolone are as much effective as NSAID's in the treatment of acute gout. Studies suggest that prednisolone is as effective as naproxen and can be considered safer than most NSAID's with lesser side effects.[21,22]

Cost Estimation

Cost of different drugs per different doses.

Average Cost (per month):Rs.600

Maximum Cost: Rs. 915

Minimum Cost: Rs. 120

The cost of different drugs according to their dose and brand is given in the above table. The average cost per month was found to be Rs.600. Minimum cost was found to be Rs.120 whereas maximum cost was found to be Rs.915.

Tables and Figures

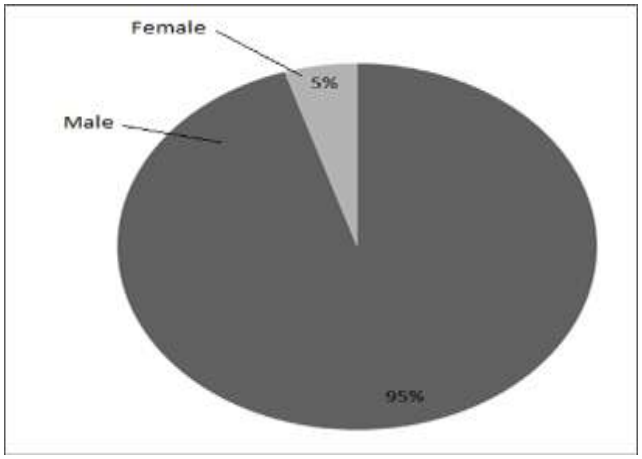

Figure 1: Gender wise distribution of study population

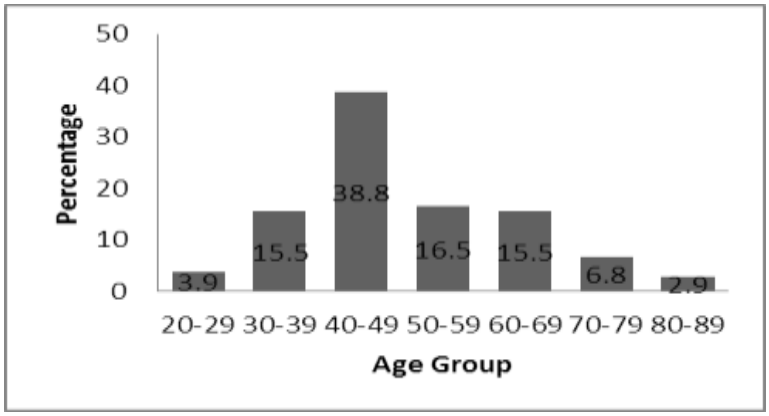

Figure 2: Age wise distribution of study population

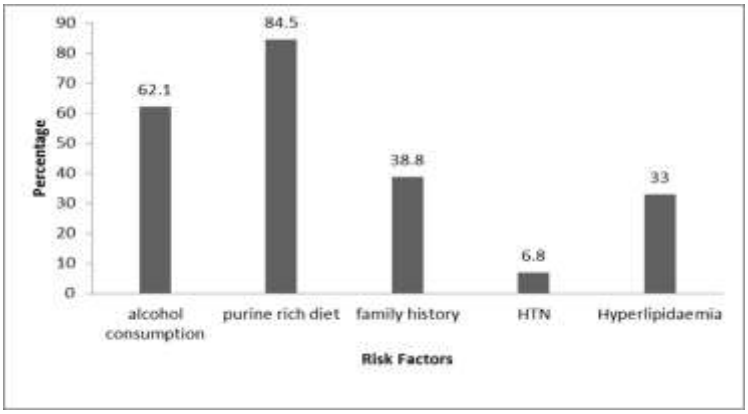

Figure 3: Risk depending on different factors. (HTN=Hypertension)

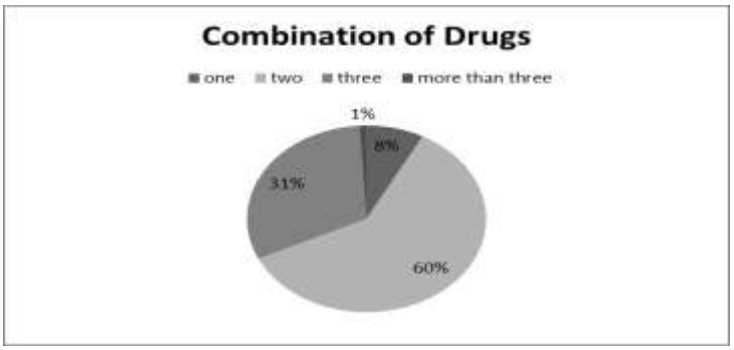

Figure 4: Percentage of patients taking different combination of drugs

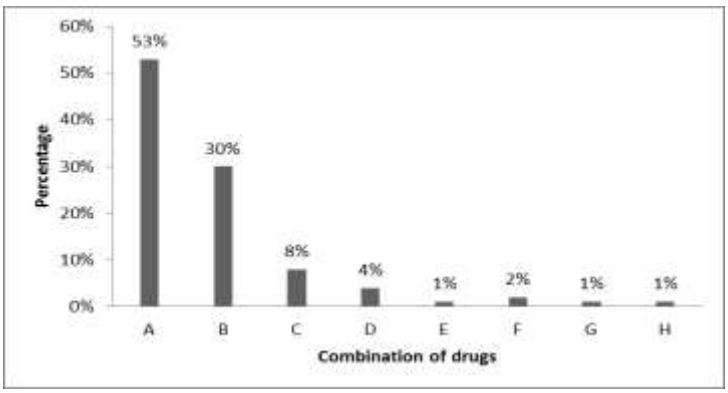

Figure 5: Different drug combination (based on Table 1)

Table 1: Combination of different drugs prescribed in practice

S.N.	COMBINATION OF DRUGS	NUMBER	PERCENTAGE
1	Colchicine + Febuxostat(A)	50	53%
2	Colchicine + Febuxostat + Prednisolone(B)	28	30%
3	Colchicine + Allopurinol(C)	8	8%
4	Colchicine + Allopurinol + prednisolone(D)	4	1. 4% 4%
5	Allopurinol + Prednisolone + Colchicine + Febuxostat (E)	1	1%
6	Allopurinol + Febuxostat (F)	2	2%
7	Febuxostat + Prednisolone(G)	1	1%
8	Colchicine + Prednisolone(H)	1	1%

Table 2: Cost Estimation

S.N.	DRUGS	COST(Rs.) (per 10 tabs)
1	Colchicine (0.5 mg)	40
2	Febuxostat (80 mg)	180
3	Febuxostat (40 mg)	80
4	Allopurinol (300 mg)	110
5	Allopurinol (100 mg)	40
6	Prednisolone (10 mg)	60

CONCLUSION

Acute gout is a global problem worldwide. This study revealed that the middle aged men and post-menopausal women were more affected by acute gout. The most affected age group was 40-49 years. This study also showed that colchicine was frequently prescribed. The combination of colchicine and febuxostat both in tablet forms was prescribed the most. Alcohol consumption and purine rich diet were seen as the major risk factors of acute gout and also increases the severity of the disease. The mean price per day was also comparatively higher for an average Nepali national.

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