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A hospital based retrospective study on prevalence of hyperuricemia in Lumbini zone, Nepal

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ABSTRACT

The prevalence of hyperuricemia has been increasing both in developing and developed countries. The purpose of the present study was to investigate the prevalence of hyperuricemia and the association between SUA. This is the cross sectional study among patients of outpatient department (OPD) of Universal College of Medical Sciences Teaching Hospital, Bhairahawa, Lumbini zone, Nepal who have attended for medical checkup. Serum uric acid was estimated by uricase/PAP method. Overall prevalence of hyperuricemia among the total population (3520) was 17.38%. Among the hyperuricemic population, the prevalence was 17.20% in men and 23.64% in women. In different age groups of age < 20 years to age >70 years; hyperuricemia in men and women were 9.62%, 7.62±0.46 to 29.12%, 8.56±1.30 and 14.4% 6.81±0.85 to 31.3%, 6.84±0.68 respectively. prevalence of hyperuricemia was high among these populations of Lumbini zone. Hyperuricemia may be considered as an independent indicator. It may enhance the risk for getting diseases.

Key words: Prevalence, Investigation, Hyperuricemia, Serum Uric Acid, Population.

INTRODUCTION

Gout is an inflammatory arthritis caused by the deposition of monosodium urate crystals in tissues [1]. This condition typically occurs after years of sustained hyperuricemia. It is estimated to affect 5.1 million people in the United States according to the most recent National health & Nutrition Examination Survey (NHANES) [2]. Two Important risk factors that have been implicated in the development of hyperuricemia and gout are obesity [3,4] and aging.

Hyperuricemia is diagnosed in 5 – 30% of general Population [5] in the past several decades, the prevalence of hyperuricemia varrried greatly and appeared to be increasing [6]. In Nepal, the prevalence of hyperuricemia was 21.42 % [7] In Thailand,10.6% [8] in accordance with previous studies, it is found that serum uric acid levels are higher in men than in women, although uric acid levels in women tend to increase above the age of 50 years.

Although the prevalence is higher among some ethnic groups, it appears to be increasing both in developing and developed countries [4]. The prevalence of hyperuricemia in China in1980 was reported 1.4% in men and 1.3% in women. In 1998 the prevalence of hyperuricemia in China was 14.2% in men & 7.11% in women. Serum Uric acid (SUA) concentration increases with age and further increases after menopausal in women.The prevalence of hyperuricemia is also strongly associated with economical development and life style factors [9].

Lumbini Zone is one of the developing zone of Nepal located in the central region and is well connected with hills & Terai area & has mixed types of populations. Mostly they are migrated from India & adjacent part [9].

Hyperuricemia may include many complications such as chronic gout and renal failure [10]. Therefore, it is important to study the prevalence of hyperuricemia is Lumbini Zone, Nepal. So the present study was carried out to determine the prevalence of hyperuricemia among men and women of Lumbini zone, Nepal who had come to the Universal College of Medical Sciences-Teaching Hospital, Bhairahawa, Nepal. This study will help us to know about the demographic pattern of hyperuricemia and also about the age group that will have more chance to develop gout and other related complications.

Millions of people in developing countries are facing a double health burden that represents an unsettling modern-day paradox i.e. the impact of poverty related diseases (associated with contagious & nutrition) is being exacerbated by the increasing load of chronic non-communicable diseases [11].

MATERIALS AND METHODS

We conducted retrospective study of 3520 out patients for investigation of Serum Uric acid (SUA) level in the Biochemistry Department, Universal College of Medical Sciences Teaching Hospital, Bhairahawa, Nepal from March 2010 to November 2013. Blood samples of selected patients were withdrawn under supervision of Biochemistry department. Blood samples were collected in clean vacutainers and SUA was estimated by kit method (Uricase/PAP method) using Erba fully automated analyser. The study protocol was duly approved by the ethical committee of the UCMS, Bhairahawa Nepal.

We defined subjects as hyperuricemia if their SUA concentration was >7mg/dl in men and >6 mg/dl in women [12-15]. Obtained data were fed into MS excel sheet and analysed using SPSS.

RESULTS

Table 1: Shows that 3520 patients were investigated (1376 men & 2144 women), overall prevalence of hyperuricemia was 17.38% and among hyperuricemic population, the prevalence in men & women was 17.20% and 23.64% respectively.

Table1: Prevalence of Hyperuricemia in Different Gender

Sex	Normal	Elevated	Prevalence
Male	1174	202	14.68%
Female	1734	410	19.12%
Total	2908	612	17.38%

Table 2: Prevalence of hyperuricemia in different age group & sex

Age Group (in Years)	Sex	Total	Normal	Elevated	Prevalence
< 20	Men	67	60	7	10.44%
	Women	89	74	15	16.85%
21-30	Men	208	188	20	9.62%
	Women	403	345	58	14.4%
31-40	Men	285	240	45	15.79%
	Women	550	470	80	14.54%
41-50	Men	263	231	32	12.17%
	Women	488	410	78	15.99%
51-60	Men	294	249	45	15.3%
	Women	372	268	104	27.96%
61-70	Men	180	150	30	16.67%
	Women	167	115	52	31.13%
> 70	Men	79	56	23	29.12%
	Women	75	52	23	30.67%

Table 2 and 3: Shows prevalence of hyperuricemia in different age groups i.e. age <20 years to >70 years in men &women. The prevalence range was found 9.62% (7.62±0.46) to 29.12% (8.56±1.30) and 14.4% (6.81±0.85) to 31.3% (6.84±0.68) respectively.

Table 3: Comparison of serum uric acid levels in different age group & sex

Age Group (in Years)	Sex	Total (Mean±S.D.)	Normal (Mean±S.D.)	Elevated (Mean±S.D.)
< 20	Men	5.52±1.26	5.22±0.94	8.0±0.9
	Women	5.11±1.27	4.69±0.79	7.20±1.17
21-30	Men	5.67±1.09	5.45±0.92	7.62±0.46
	Women	4.99±1.05	4.68±0.73	6.81±0.85
31-40	Men	5.79±1.24	5.39±0.86	7.93±0.62
	Women	5.08±1.09	4.77±0.76	6.93±0.90
41-50	Men	5.77±1.19	7.88±0.79	7.88±0.79
	Women	5.18±1.02	4.86±0.72	6.85±0.65
51-60	Men	5.97±1.33	5.59±0.83	8.04±1.63
	Women	5.45±1.05	4.94±0.7	6.79±0.58
61-70	Men	6.07±1.52	5.57±0.86	8.60±1.60
	Women	5.57±1.10	4.99±0.67	6.84±0.68
> 70	Men	6.52±1.63	5.67±0.81	8.56±1.30
	Women	5.77±1.33	5.07±0.81	7.36±1.30

It was found that >70 years was the risk point for male and 61-70 years age group in women. The overall prevalence of hyperuricemia was found 17.38%. Hyperuricemia was more frequent in women than the men 11.64% vs 5.74% respectively. The prevalence of mean SUA was lowest in the age groups of 21-30 years 8.0±0.9 , 7.20±1.17 and highest in the age groups of 51-60 years 5.59±0.83, 4.94±0.7 in both the sexes i.e. men & women respectively.

Furthermore our study also showed that the total prevalence of hyperuricemia is highest in age groups of 51-60 years in women 2.95%.It was found that the prevalence rate of hyperuricemia increases as the age rises. As it could be seen below from the table the incident rate of hyperuricemia was at the highest level of age. Association between age and hyperuricemia was found to be statistically significant ($p<0.05$).

DISCUSSION

Among the subjects investigated for SUA, 17.38% were diagnosed to have hyperuricemia. Which shows almost similar than estimates for several other populations. In Chitwan district of Nepal [9], the prevalence of hyperuricemia was 21.42%. In Java (1992) the prevalence of hyperuricemia was 24.3% [16]. In United States (1987) the prevalence rate of asymptomatic hyperuricemia was 2.13% [17]

Hyperuricemia is consistently more common in men than in women. According to the other studies [18,19,20] Japanese females reportedly increasing uric acid levels up to the age of 70 years and over [20]. In the present study increased SUA levels in women was in the age group of 61-70 and in men >70 years. Increased SUA level after menopause is due to hormone estrogen [21], reaching concentrations similar to those in men. But in men SUA level is found to be decrease with age [22, 23]. The mechanism behind this remains unclear.

Age appears to be an important risk factor to raise SUA level [9]. Age groups of 21-30 years were relatively low prevalence 9.62%, 14.4% in men and women respectively. Maximum cases of hyperuricemia were seen in 61-70 and >70 years age groups of men & women respectively.

In New Zealand [24] hyperuricemia was more common in Maori men 27.1% than in European men 9.4% and in Maori women 26.6% than in European women 10.5%. In Saudi Arabia [25] the prevalence of hyperuricemia was only 8.42%.

This is hospital record based study, therefore doesn't simulate the occurrence in community. Sometime we cannot get complete record of patients, which could have been useful to give important information to the patients with rapid industrial development and due to that hike in financial status possibility of improved nutrition and promotion of successful health and medical care programs in Nepal, life expectancy has been prolonged and the elderly population has been increased; thus preventing and control of chronic diseases have become more important than

before. Hyperuricemia may induce many complications such as chronic gout, distortion of joints and renal failure, which may increase medical care cost. Therefore, it is important to study the hyperuricemia in Nepal. In view of the rapid increase in the prevalence of various clinical, anthopometric and biochemicals parameters in these lesser studied population, high risk screening and effective public intervention educational programs are urgently needed.

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