



Correlation of Chronic Back Pain and Hyperuricemia, Our Hospital Experience

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JPRI/2021/v33i52B33628

Editor(s):

(1) Dr. Jongwha Chang, University of Texas, College of Pharmacy, USA.

Reviewers:

(1) Filip Nina, University of Medicine and Pharmacy Grigore T Popa Iasi, Romania.

(2) Meltem Koç, Muğla Sıtkı Koçman University, Turkey.

Complete Peer review History, details of the editor(s), Reviewers and additional Reviewers are available here:

<https://www.sdiarticle5.com/review-history/78086>

Original Research Article

Received 26 September 2021

Accepted 01 December 2021

Published 02 December 2021

ABSTRACT

Objective: This study aimed to analyze the prevalence of hyperuricemia in individuals with chronic low back pain.

Methodology: It was a descriptive cross-sectional study performed between January 2021 to June 2021 in Medicine department of Bilawal Medical College LUMHS Jamshoro Pakistan. Patients between the age of 18 to 65 years have been investigated. Data was collected using a designed questionnaire. X-rays and Magnetic Resonance Imaging (MRI) of the lumbosacral spine were used to evaluate any discrepancies associated with low back pain. The levels of uric acid in the blood were measured and documented.

Results: Out of 88 patients with chronic low back pain, 22 (25%) reported hyperuricemia. There was no significant difference in uric acid levels between men and women ($P>0.05$). We observed

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that 86.36 %t (n=19) patients with elevated serum uric acid levels also experienced joint pain. Further radiological examination revealed lumbar disc prolapse in 72.7 % (n=16). We found that in 95.45% of the patients, disc space narrowing was present.

Conclusion: Regardless of gender, one in four people with low back pain had hyperuricemia. Patients with low back pain have varying occupational and co-morbidities. Hypouricemia appears to be associated with lumbar disc prolapse and lumbar vertebral joint space constriction. This reveals that hyperuricemia aggravates degenerative spondylolisthesis.

Keywords: Low back pain; hyperuricemia; gout; spondylolisthesis.

1. INTRODUCTION

Chronic low back pain is a typical problem, and studies have reported that 2/3rd of the population suffer from this problem at some instance in their lives [1,2]. Globally it is a major health-related issue and may result in a financial burden on individuals suffering from low back pain. Furthermore, it may reduce the efficacy and output of the individuals, and it is the primary cause of morbidity [3]. The radiating low back pain may be linked with joint pain of the lower limbs. It may be associated with hyperuricemia that causes inflammation of the joints results in joint pain [4]. A study performed in Pakistan stated that 17% of the patients with chronic low back pain had hyperuricemia [5].

Hyperuricemia is defined as abnormally high uric acid levels in the blood, and a lack of protein metabolism causes it. The Uric acid levels in the blood should be between 3.4 and 7.2 mg/dL (200-430 mg/dL) for men while it's 2.4-6.1 mg/dL (140-360 mol/L) for women [6]. It is also reported that around 10% of the patients with hyperuricemia advance to gout [7].

Gout is caused by the crystallization of monosodium urate in and around major joints. According to a study, Patients above the age of 50 years are more likely to develop gout, which is more prevalent among males [8]. Gout is a type of arthritis that affects the joints impacts the appendicular skeleton's peripheral joints. Moreover, the involvement of the axial joint is also reported in some studies. Spinal gout is linked to the spinal cord, even if it is identified late and results in compression, osseous erosion, and lumbar disc degeneration of the spinal cord, and it results in lower back pain [9]. In this condition, the Intervertebral discs, sacroiliac joints, and even the intervertebral disc are usually involved [10]. For radiological analysis, magnetic resonance imaging (MRI) is used. On T1-, it produces a homogenous, middle to low signal. On T2-weighted pictures, there are varied signal intensities and weighted images [11].

The purpose of this investigation is to examine hyperuricemia in patients with chronic low back pain in relation to gender, age, and radiological abnormalities.

2. MATERIALS AND METHODS

It was a descriptive cross-sectional study performed between January 2021 to June 2021 in Medicine department of Bilawal Medical College LUMHS Jamshoro Pakistan. Patients were incorporated utilizing a convenience sampling technique.

In the current study, 88 participants with low back pain for at least 12 weeks and aged between 18-65 years were recruited. All patients were asked to provide a complete medical history. Low back pain was assessed, taking into account its time period with accompanying radicular leg discomfort and lower limb joint pain.

Radiological examination with the help of X-rays and MRIs of the lumbosacral spine was performed to observe any substantial changes in the spine, like disc bulges expansion, disc degeneration, and narrowing of joint spaces of the lumbar. All patients' serum uric acid levels were determined from the lab's data.

SPSS version 21.0 was used to enter and evaluate the data. The number of individuals and percentages were calculated for each categorical variable like age, gender, joint pain, disc enlargement, disc degeneration, narrowing of joint space, and the patient serum uric acid levels.

For data analysis, the Chi-square test and Fischer's exact test were used. P-values less than 0.05 were considered significant.

3. RESULTS

Data of 88 participants with low back pain have been analyzed. The total number of males was 46 (52.27%). The highest number of patients with low back were from the age group 51-65 years,

47 (53.40%). Only six patients were from the age group 18-30 years Table 1.

Data analysis shows that 35 (76.08%) males and 31 (73.80%) females reported normal, and 11 (23.91%) and 11 (26.19%) females reported elevated serum uric acid levels. No significant differences have been observed among the genders (P>0.05) Table 2.

The patients were further divided into 4 age groups of 18-30, 31-40 years, 41-50 years, and 51 to 65 years. The total number of individuals with normal serum uric acid levels in each age

group was 4 (66.6%), 7 (77.77%), 20 (76.92), and 35 (74.46), respectively. The number of patients with raised serum uric acid levels was 2 (33.3%), 2 (22.2%), 6 (23.07%), and 12 (25.53%), respectively. No significant difference has been observed ($X^2 = 0.317$, $P = 0.0566$) Table 3.

We observed that 86.36 %t (n=19) patients with elevated serum uric acid levels also experienced joint pain. Further radiological examination revealed lumbar disc prolapse in 72.7 % (n=16). We found that in 95.45% of the patients, disc space narrowing was present Table 4.

Table 1. Demographic characteristics of the study population

Variable	Frequency (n=88)	Percentage
Gender		
Male	46	52.27
Females	42	47.72
Age Group		
18-30 years	06	6.81
31-40 years	09	10.22
41-50 years	26	29.54
51-65 years	47	53.40

Table 2. Serum Uric Acid Level among males and females

Serum Uric Acid Level	Male	Females	Chi- Square ' P- Values
Normal	35 (76.08%)	31 (73.80%)	$X^2 = 0.0607$, $P = 0.805$
Elevated	11 (23.91%)	11 (26.19%)	
Total	46 (100%)	42 (100%)	

Table 3. Serum uric acid level in different age groups

Serum Uric Acid Level	18-30 years	31-40 years	41-50 years	51-65 years	Chi- Square ' P- Values
Normal	4 (66.6%)	7 (77.77%)	20 (76.92)	35 (74.46)	$X^2 = 0.317$,
Elevated	2 (33.3%)	2 (22.2%)	6 (23.07%)	12 (25.53%)	$P = 0.0566$
Total	06	09	26	47	

Table 4. Radiological finding in patients with hyperuricemia

Radiological finding	Frequency	Percentage
Joint pain	19	86.36
Lumber disc prolapse	16	72.72
Disc space narrowing	21	95.45
Disc Degeneration	12	54.54

Table 5. Radiological finding in patients with no-hyperuricemia

Radiological Finding	Frequency	Percentage
Joint pain	06	
Lumber disc prolapse	02	
Disc space narrowing	03	
Disc Degeneration	01	

Out of 66 individuals with normal levels of serum uric acid, we found 9.09% (n=06) individuals with joint pain, 3.03% (n=02) with Lumbar disc prolapse, Disc space narrowing was observed in 4.54%, and disc degeneration was present in 7.57% (n=5) individuals Table 5.

4. DISCUSSION

Hyperuricemia is a condition in which the uric acid level in the blood is elevated, and the body produces too much uric acid. As a result of a malfunction in protein metabolism, this condition might develop [7,12]. Hyperuricemia has been linked to various other diseases, including cardiovascular disease and hereditary disorders, nutritional factors, liquor usage, metabolic disease, and kidney disease [13-15].

Gout is characterized by discomfort in the body's major joints, appendicular skeleton, and articular inflammation on a surface [16]. A variety of circumstances can cause low back pain. In the current study, we focused on the uric acid levels in the blood. In low back pain patients, acid levels are used to determine hyperuricemia.

The results of our research revealed that hyperuricemia occurs in one-fourth of people with chronic low back pain. Similar findings are reported in a previous study [7]. Our study also reported that elevated uric acid levels could significantly aggravate back pain or cause spinal gout. In the case of gender, we found no correlation between hyperuricemia and low back pain.

The current study found that 2/3rd patients reporting low back pain were between 40 and 65 years. Our study findings corroborate with the results of the previous study finding [17]. This study also reported an increased prevalence of gout in the aged population.

Patients' occupation was found to have a variable link with low back pain, hyperuricemia, and previous medical problems. This is consistent with the previous study's findings, which found no difference in gout prevalence, age groups, or other co-morbidities [18].

In our study, patients with hyperuricemic low back pain exhibited a strong correlation with the common presentation of joint pain. A study stated that approximately 81 percent of individuals suffering from hyperuricemia came

with knee pain and metatarsophalangeal joint pain [18]. This is explained by gouty arthritis causing joint pain [19].

Even though computed tomography's diagnostic capabilities are more precise and accurate, we only utilized X-rays and Magnetic Resonance Imaging (MRI) due to the patients' financial issues and the fact that they have been reported to be useful in Gout diagnosis [20]. In our study, around 60% of the patients with hyperuricemia had joint space narrowing of the lumbosacral vertebrae on MRI scans. Similar findings are also reported in previous investigations [21]. Furthermore, another study claimed that narrowing of joint spaces induces clinical low back pain [22]. A recent study performed in Pakistan reported a significant connotation of raised uric acid levels with narrowing of the joint space and a lumbar disc of the lumbar vertebrae, and it supplements degenerative spondylolisthesis [23].

Our findings suggest that hyperuricemia has a substantial role in the aggravation of chronic low back pain. Furthermore, we also investigated statistically with the finding of MRI that raised uric acid levels may exacerbate the process of degenerative spondylolisthesis. A large-scale study is needed immediately to figure out more definitive information about the distribution based on demographic and etiological pathways connected to hyperuricemia in people with low back pain.

Our study's limitations included limited data and the fact that it was conducted in a single location. Though this investigation was done at a tertiary hospital specialty clinic, we are fortunate that our patients from all over the country visit and represent various socioeconomic classes.

5. CONCLUSION

Our findings imply that one out of every four individuals with low back pain had hyperuricemia, regardless of gender. Patients with low back pain have variable relationships with their work and pre-existing co-morbidities. Our findings show a substantial link between lumbar disc prolapse and lumbar vertebral joint space constriction and hyperuricemia. This shows that hyperuricemia exacerbates degenerative spondylolisthesis through mechanisms that have yet to be discovered.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:

The peer review history for this paper can be accessed here:
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