

## A Hospital Based Prospective Study to Evaluate the Risk Factors of Uveitis in Ankylosing Spondylitis at Newly Established Tertiary Care Centre

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### Abstract

**Background:** Ankylosing spondylitis (AS) is a chronic, inflammatory disease of the axial spine that can manifest with various clinical signs and symptoms. The present study was conducted in the Department of Orthopedics, Government Medical College, Barmer, Rajasthan, India with the aim of evaluating the risk factors of uveitis in Ankylosing spondylitis. **Materials & Methods:** A total of 50 AS patients were enrolled. Complete demographic and clinical data of all the subjects was obtained. The diagnosis of uveitis is performed by ophthalmologists. Through clinical and medical examination of all the subjects was carried out. Blood samples were obtained and biochemical profile was assessed. Statistical analysis was done by SPSS software. **Results:** Prevalence of uveitis was 16 percent. Non-significant results were obtained while comparing the mean AST and ALT levels among uveitis and non-uveitis patients. Mean uric acid level among the patients of uveitis group was significant higher in comparison to non-uveitis group. Mean circulating immune complexes among the patients of uveitis group was significant higher in comparison to non-uveitis group. **Conclusion:** From the above results, the authors concluded that hip involvement and serum uric acid and immune complexes might be associated with higher rates of uveitis in AS.

**Keywords:** Uveitis, Ankylosing spondylitis.

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### Introduction

Ankylosing spondylitis (AS) is a chronic, inflammatory disease of the axial spine that can manifest with various clinical signs and symptoms. Chronic back pain and progressive spinal stiffness are the most common features of the disease. Involvement of the spine and sacroiliac (SI) joints, peripheral joints, digits, entheses are characteristic of the disease. Impaired spinal mobility, postural abnormalities, buttock pain, hip pain, peripheral arthritis, enthesitis, and dactylitis ("sausage digits") are all associated with AS. As an autoimmune disease, AS develops through complex interactions between genetic background and environmental factors. Although significant progress has been achieved in the past decades, the etiology of AS remains unclear to some extent. To date, studies have revealed some factors that may be related to the occurrence of AS, including genetic background, immune reaction, microbial infection, and endocrinal abnormality. Genetic factors have been acknowledged as crucial in the genesis of AS. The correlation between AS and genetics has been a perpetual topic since hereditary factors of AS were first confirmed within families in 1961 [1-3].

Extra-articular manifestations of AS are not rare, such as uveitis, bowel disease as well as lung, heart, skin, bone and kidney involved. Uveitis may be the most common extra-articular manifestation, occurring in 20% to 30% of the patients with AS. It is reported that about 90% of the cases involve anterior uveitis, whereas posterior uveitis occurs rarely. The strong association between AS and uveitis has raised great concern among researchers and doctors. Despite the high occurrence of uveitis in AS, knowledge on the risks factors for developing uveitis in patients with AS is limited [4-6]. Hence; the present study was conducted in the Department of Orthopedics, Government Medical College, Barmer, Rajasthan, India with the aim of evaluating the risk factors of uveitis in Ankylosing spondylitis.

### Materials & methods

The present study was conducted in the Department of Orthopedics, Government Medical College, Barmer, Rajasthan, India with the aim of evaluating the risk factors of uveitis in ankylosing spondylitis. A total of 50 AS patients were enrolled. Complete demographic and clinical data of all the subjects was obtained. The diagnosis of uveitis is performed by ophthalmologists. There are no definite diagnostic criteria for uveitis, so ocular symptoms, fundus examination, and associated laboratory testing were taken into consideration to make an actual diagnosis. Through clinical and medical examination of all the subjects was carried out. Blood samples were obtained and biochemical profile was assessed. Radiographic imaging details of all the patients were obtained. Statistical analysis was done by SPSS software. Student t test and chi-square test was used for evaluation of level of significance.

### Results

A total of 50 subjects with AS were enrolled. Among these subjects, uveitis was found to be present in 8 subjects. Hence; prevalence of uveitis was 16 percent. Mean age of the uveitis patients and non-

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uveitis patients was 35.6 years and 34.2 years respectively. Non-significant results were obtained while comparing the gender-wise distribution among uveitis patients and non-uveitis patients. Hip involvement was significantly higher in uveitis patients. ESR levels among the uveitis patients and non-uveitis patients were 43.2 mm/h and 41.5 mm/h respectively. CRP levels among the uveitis patients and non-uveitis patients were 19.1 mg/L and 19.5 mg/L respectively. AST levels among the uveitis patients and non-uveitis patients were

26.5 U/L and 28.4 U/L respectively. ALT levels among the uveitis patients and non-uveitis patients were 29.3 U/L and 27.2 U/L respectively. Non-significant results were obtained while comparing the mean AST and ALT levels among uveitis and non-uveitis patients. Mean uric acid level among the patients of uveitis group was significantly higher in comparison to non-uveitis group.

**Table 1: Prevalence of Uveitis among AS patients**

Variable	Number of subjects	Percentage
Uveitis absent	42	84
Uveitis present	8	16

**Table 2: Comparison of clinical data between uveitis and non-uveitis subjects**

Variable	Uveitis	Non-uveitis	p- value
Mean age (years)	35.6	34.2	0.115
Male/Female	6/2	31/11	0.85
Hip involvement (%)	50	26.19	0.00 (Significant)

**Table 3: Comparison of biochemical profile uveitis and non-uveitis subjects**

Biochemical profile	Uveitis	Non-uveitis	p- value
ESR (mm/h)	43.2	41.5	0.76
CRP (mg/L)	19.1	19.5	0.39
Uric acid ( $\mu$ mol/L)	362.8	311.2	0.00 (Significant)
AST (U/L)	26.5	28.4	0.46
ALT (U/L)	29.3	27.2	0.27

## Discussion

Ankylosing spondylitis is a chronic inflammatory rheumatic disorder that primarily affects the axial skeleton. Sacroiliitis is its hallmark, accompanied by inflammation of the entheses (points of union between tendon, ligament, or capsule and bone) and formation of syndesmophytes, leading to spinal ankylosis in later stages. Prevalence estimates vary between 0.1% and 2% in different populations. The male:female ratio is around 5:1, and the peak age of onset is at 15-35 years. Because of its insidious nature, the diagnosis is sometimes delayed until late stages of the disease. Until recently, treatment has been limited to non-steroidal anti-inflammatory drugs and physiotherapy, but the development of cytokine inhibitors that inhibit the activity of tumour necrosis factor  $\alpha$  has been an important advance in treatment[7-9]. Hence; the present study was conducted in the Department of Orthopedics, Government Medical College, Barmer, Rajasthan, India with the aim of evaluating the risk factors of uveitis in ankylosing spondylitis. A total of 50 subjects with AS were enrolled. Among these subjects, uveitis was found to be present in 8 subjects. Hence; prevalence of uveitis was 16 percent. Mean age of the uveitis patients and non-uveitis patients was 35.6 years and 34.2 years respectively. Non-significant results were obtained while comparing the gender-wise distribution among uveitis patients and non-uveitis patients. Hip involvement was significantly higher in uveitis patients. ESR levels among the uveitis patients and non-uveitis patients were 43.2 mm/h and 41.5 mm/h respectively. CRP levels among the uveitis patients and non-uveitis patients were 19.1 mg/L and 19.5 mg/L respectively. Our results were in concordance with the results obtained by Sun L et al. They analyzed the risk factors of uveitis in patients with AS. Of 390 patients with AS (80.5% male, mean age 33.3 years), 38 (9.7%) had experienced 1 or more episodes of uveitis. The incidence rate for hip-joint lesion was obviously higher for patients with uveitis than the nonuveitis group (44.7% vs 22.2%;  $P < 0.01$ ). The number of peripheral arthritis was also larger for the uveitis group than nonuveitis group ( $2.18 \pm 0.23$  vs  $0.55 \pm 0.04$ ;  $P < 0.001$ ). However, there were no significant differences in disease duration, erythrocyte sedimentation rate (ESR), and C-reactive protein (CRP) between the 2 groups. Binary logistic regression results showed that ASO (OR = 12.2, 95% CI:3.6–41.3,  $P < 0.01$ ) and the number of peripheral arthritis (OR = 4.1, 95% CI:2.6–6.3,  $P < 0.01$ ) are significantly associated with uveitis in AS. Their study provides some

evidence that hip-joint lesion, the number of peripheral arthritis, ASO, and CIC may be associated with higher rates of uveitis in AS[10].

In the present study, AST levels among the uveitis patients and non-uveitis patients were 26.5 U/L and 28.4 U/L respectively. ALT levels among the uveitis patients and non-uveitis patients were 29.3 U/L and 27.2 U/L respectively. Non-significant results were obtained while comparing the mean AST and ALT levels among uveitis and non-uveitis patients. Mean uric acid level among the patients of uveitis group was significantly higher in comparison to non-uveitis group. Yen JC et al, in another study, assessed Acute Anterior Uveitis as a Risk Factor of Ankylosing Spondylitis. The crude hazard ratio was 2.667 for the acute anterior uveitis (AAU) group, and the adjusted hazard ratio was 2.705 for the AAU group. The observation time of the AS-free group was shorter for AAU patients compared with the control group (1507 versus 1578 days). Moreover, in the AAU patients, the younger age onset of AAU (less than 30 years old here) would lead to an earlier diagnosis of AS later with a median of 1445.5 (742–2241) versus 1544 (819–2289) days of survival for the group of age onset of AAU greater than 30 years old. The difference is statistically significant ( $p < 0.05$ ). Conclusions: AAU was a risk factor for AS[11].

## Conclusion

From the above results, the authors concluded that hip involvement and serum uric acid and immune complexes might be associated with higher rates of uveitis in AS.

## References

1. Proft F, Poddubnyy D. Ankylosing spondylitis and axial spondyloarthritis: recent insights and impact of new classification criteria. *Ther Adv Musculoskelet Dis.* 2018;10(5-6): 129- 139.
2. Watad A, Cuthbert RJ, Amital H, McGonagle D. Enthesitis: Much More Than Focal Insertion Point Inflammation. *Curr Rheumatol Rep.* 2018;20(7):41.
3. Bridgewood C, Watad A. arthritis: new insights into clinical aspects, translational immunology and therapeutics. *Curr Opin Rheumatol.* 2018 ;30 (5): 526-532.
4. Wang W, Huang G, Huang T, Wu R. Bilaterally primary cementless total hip arthroplasty in patients with ankylosing spondylitis. *BMC Musculoskelet. Disord.* 2014;15:344.

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5. Schmalzried TP, Amstutz HC, Dorey FJ. Nerve palsy associated with total hip replacement. Risk factors and prognosis. *J. Bone Jt. Surg. Am.* 1991;73:1074–1080.
  6. Zheng GQ, Zhang YG, Chen JY, Wang Y. Decision making regarding spinal osteotomy and total hip replacement for ankylosing spondylitis: experience with 28 patients. *Bone Jt. J.* 2014;96-B:360–365.
  7. Lee SH, Lee GW, Seol YJ, Park KS, Yoon TR. Comparison of outcomes of total hip arthroplasty between patients with ankylosing spondylitis and avascular necrosis of the femoral head. *Clin. Orthop. Surg.* 2017;9:263–269.
  8. Kim KT, et al. Surgical treatment of "chin-on-pubis" deformity in a patient with ankylosing spondylitis: a case report of consecutive cervical, thoracic, and lumbar corrective osteotomies. *Spine.* 2012;37:E1017–E1021.
  9. Yang P, Wang C, Wang K. Effect of morphological changes in proximal femur on prosthesis selection of total hip arthroplasty in patients with ankylosing spondylitis. *ZhongguoXiu Fu Chong JianWaiKeZaZhi.* 2006;20:448–450.
  10. Sun L, Wu R, Xue Q, Wang F, Lu P. Risk factors of uveitis in ankylosing spondylitis: An observational study. *Medicine (Baltimore).* 2016;95(28):e4233.
  11. Yen JC, Hsu CA, Hsiao SH, Hsu MH. Acute Anterior Uveitis as a Risk Factor of Ankylosing Spondylitis-A National Population-Based Study. *Int J Environ Res Public Health.* 2017;14(1):107.

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