ORIGINAL RESEARCH PAPER

Volume-7 | Issue-5 | May-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

A STUDY OF ASSOCIATION BETWEEN LIPID PARAMETERS AND DISEASE ACTIVITY ASSESSED BY USING BATH ANKYLOSING SPONDYLITS DISEASE ACTIVITY INDEX (BASDAI) IN ANKYLOSING SPONDYLITIS

Rheumatology

Sarvagya Mishra Postgraduate Resident, Department of Medicine, Sri Aurobindo Medical College & PGI, Indore, India

Abhishek Singhai* Assistant Professor, Department of Medicine, All India Institute of Medical Sciences, Bhopal, India *Corresponding Author

Prakash Joshi Professor, Department of Medicine, Sri Aurobindo Medical College & PGI, Indore, India

Rajesh Kumar Jha Professor & Head, Department of Medicine, Sri Aurobindo Medical College & PGI, Indore, India

ABSTRACT

Introduction: Ankylosing Spondylitis (AS) is an inflammatory disorder of unknown etiology affecting primarily the axial skeleton, peripheral joints and extraarticular structures, beginning in the second or third decade; male-to-female prevalence being 2:1 and 3:1. Aim of our study was to assess association between lipid parameters and disease activity assessed by using Bath Ankylosing Spondylits Disease Activity Index (BASDAI) in Ankylosing Spondylitis.

Materials & Methods: The study group included 30 patients with a known history or clinical features suggestive of Ankylosing Spondylitis. The control group included 30 normal adult patients without any previous history. All patients included in the study underwent detailed clinical history, analysis, physical examination and necessary investigations. The study was approved by ethical committee and an informed written consent was obtained from every patient. Disease activity was measured using BASDAI.

Results: In our study, we included a total no. of 60 patients, out of which 30 cases were the patients with a known history or clinical features suggestive of AS. A total of 30 normal adults who were age and sex matched with the study group were taken as controls. In our study, cholesterol (r=0.515, p=0.004), Triglycerides (r=0.500, p=0.005) and LDL (r=0.517, p=0.003) was positively correlated with BASDAI and the difference was found to be statistically significant. HDL (r=0.627, p=.000) was negatively correlated with BASDAI but the difference was statistically significant.

Conclusion: Patients with AS have higher lipid abnormalities than shown by controls. Every effort should be made in order to control inflammation and traditional risk factors in this population, to avoid the consequences of accelerated atherogenesis. This should provide impetus to early intervention strategies to prevent accelerated atherosclerosis which would help in reducing the cardiovascular morbidity and mortality associated with this disease.

KEYWORDS

Ankylosing Spondylitis, lipid profile, BASDAI

Introduction

Ankylosing Spondylitis (AS) is an inflammatory disorder of unknown etiology affecting primarily the axial skeleton, peripheral joints and extraarticular structures, beginning in the second or third decade; male-to-female prevalence being 2:1 and 3:1. AS shows correlation with the histocompatibility antigen HLA-B27. Concordance rate in identical twins is about 65%. Positive family history confers 10-30% more risk of developing AS. In White population 90% of patients with AS are HLA-B27 positive, while the prevalence among blacks is only 50%.[1] Sacroiliitis, synovitis and myxoid marrow are the first manifestations, followed by pannus and subchondral granulation tissue, marrow edema, enthesitis and chondroid differentiation. Fibrocartilage regeneration and ossification leads to complete obliteration of the joint. Inflammatory granulation tissue formation occurs in the paravertebral connective tissue at the junction of annulus fibrosus and vertebral bone and replaced by bone leading to the formation of a syndesmophyte, which then grows by continued endochondral ossification, ultimately bridging the adjacent vertebral bodies leading to "bamboo spine." There occurs diffuse osteoporosis of the spine and "squaring" or "barreling" of vertebrae. Inflammatory arthritis of the apophyseal (facet) joints with synovitis and subchondral bone marrow granulation tissue formation occurs followed by bony ankylosis. Bone mineral density is diminished in the spine and proximal femur early in the course of the disease. The presenting manifestation is dull pain, insidious in onset, in the lower lumbar or gluteal region, with low-back morning stiffness of a few hours' duration which improves with activity and returns after inactivity. The average age of symptom onset is 23 years. After a couple of months, the pain becomes persistent and bilateral. Patient rises and move around at night due to nocturnal exacerbation of pain.[2] Factors associated with poor prognosis are onset within 5-10 years, oligoarthritis, hip arthritis, high ESR, poor efficacy of NSAID, lumbar spine limitation, sausage fingers.[3] There is 50% increased risk of death due to spinal fractures, amyloidosis and cardiovascular lesions. Bony tenderness occurs at the costosternal junctions, spinous processes, iliac crests, greater trochanters, ischial tuberosities, tibial tubercles, and heels. Hip arthritis is seen in 25%, asymmetric arthritis of peripheral joints is seen in 30%. Late manifestations include neck pain and stiffness. Constitutional symptoms is the presenting complaint in old age.[2]

Loss of spinal mobility, limitation of anterior and lateral flexion and extension of the lumbar spine and limitation of chest expansion occurs which is out of proportion to the degree of bony ankylosis. As a measure of lumbar spine flexion, modified schobers test is used in which the patient stands erect, with heels together. Marks are made on the spine at the lumbosacral junction (identified by a horizontal line between the posterosuperior iliac spines) and 10 cm above. Patient bends forward maximally and the distance between the two marks is measured. In the case of normal mobility this distance increases by ≥ 5 cm and by <4 cm in the case of decreased mobility. Chest expansion is measured by the difference between maximal inspiration and maximal forced expiration in the fourth intercostal space in males or just below the breasts in females, normally it is ≥5 cm. Lateral bending is measured by the distance which the patient's middle finger travels down the leg with maximal lateral bending. Normally, its value is more then 10 cm. The disease course is variable, patient may only have mild stiffness and normal radiographs or may even have totally fused spine and severe bilateral hip arthritis.

The Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) and the Ankylosing Spondylitis Disease Activity Score (ASDAS) are measures of disease activity; the Bath Ankylosing Spondylitis Functional Index (BASFI) is a measure of limitation in activities of daily living. Spinal trauma, aortic insufficiency, respiratory failure, amyloid nephropathy shortens life span. BASDAI is used to assess the disease activity. It consists of six questions related to fatigue (Ql), spine pain (Q2), joint pain/swelling (Q3), enthesopathy (Q4) and intensity (Q5) and duration (Q6) of morning stiffness. ASDAS improves the objective properties of subjective BASDAI. ASDAS consists of 4 questions from BASDAI and the levels of CRP and ESR.[4] AS is known for causing a lifetime of pain, impaired physical function, work disability, and decreased quality of life. AS patients experience premature mortality.[5] The standardized mortality rates (SMR)

associated with AS are approximately 50% higher than in the general population.[6,7] Increased mortality is predominantly attributable to cardiovascular diseases (CV). There is increased risk of ischemic heart disease (prevalence ratio 1.2), peripheral vascular disease (ratio 1.6), atherosclerosis (ratio 1.5), congestive heart failure (1.8) and more cardiovascular risk factors like dyslipidemia (prevalence ratios between 1.3 and 1.7) in AS patients compared to healthy controls.[8] Aim of our study was to assess association between lipid parameters and disease activity assessed by using Bath Ankylosing Spondylits Disease Activity Index (BASDAI) in Ankylosing Spondylitis.

Materials & Methods

The AS study group and the control group was selected from the patients presenting to the outpatient department of the department of medicine of a tertiary care centre between September 2015 and February 2017.

Study design: It was a cross-sectional study with a sample size of 60 patients.

Selection of patients: The study group included 30 patients with a known history or clinical features suggestive of Ankylosing Spondylitis. The control group included 30 normal adult patients without any previous history.

Inclusion criteria: Patients fulfilling the Assessment of Spondyloarthritis International Society criteria for diagnosis of ankylosing spondylitis.

Exclusion criteria: We excluded subjects who have been already diagnosed with Diabetes mellitus type 2, Hypertension, Coronary artery disease, Hypothyroidism, Liver disorders, Renal disease, Known inherited disorders of lipids, Secondary dyslipidemia due to pregnancy or drugs like Beta-blockers, Thiazides, Steroids, Hypolipidemic drugs, Oral contraceptives, and Anticoagulants.

Study protocol: All patients included in the study underwent detailed clinical history, analysis, physical examination and necessary investigations. The study was approved by ethical committee and an informed written consent was obtained from every patient. Disease activity was measured using BASDAI.[9]

Data collection and method:

Lipid profile: After overnight fasting of 12 hours blood collected in the morning about 5 ml and the serum centrifuged and kept for analysis. Serum cholesterol estimation: The CHOD-PAP method, enzymatic colorimetric test was used.

Statistical analysis plan: The initial data was captured in the customized performa designed for the study. This data was entered into the Microsoft excel sheet and then online statistical software was used for analysis. Correlation was structured using pearson coefficient of correlation. The mean comparison between the two groups was done using unpaired t test.

Results

The present observational study was carried out in Department of General Medicine of a tertiary care centre. 30 AS patients and 30 healthy controls matched for age, sex and smoking status were studied. In the control group there were 28 (93.3%) males and 2 (6.7%) females. In the ankylosing spondylitis group, there were 28 (93.3%) males and 2 (6.7%) females. There was a male preponderance in both the groups. The mean age of the AS patients was 29 years and 93% of them were males, consistent with the usual pattern of the disease.

Comparison of AS Cases and Controls

The age, sex and smoking status of the cases and controls were comparable.(Table 1) The mean ESR in the control group was 12.33±5.19 mm and in the AS group was 18.30±12.20 mm. AS patients had significantly higher ESR ($p < 0.017$) consistent with the chronic underlying inflammatory process. The mean cholesterol in the control group was 146.4±29.7 mg/dl and in the AS group was 153.6±38.9 mg/dl. The difference was found to be statistically not significant (P>0.05), showing a comparable cholesterol level in both the groups. The mean triglycerides in the control group was 113.0±66.0 mg/dl and in the AS group was 125.5±63.0 mg/dl. The difference was found to be statistically not significant (P>0.05), showing a comparable triglycerides level in both the groups. The mean HDL in the control group was 45.3±10.3 mg/dl and in the AS group was 41.3±11.0 mg/dl. The difference was found to be statistically not significant (P>0.05), showing a comparable HDL level in the two groups. The mean LDL in the control group was 94.9±26.1 mg/dl and in the AS group was 98.9±44.3 mg/dl. The difference was found to be statistically not significant (P>0.05), showing a comparable LDL level in the two groups.

Table 1: Comparison of AS cases and Controls

	AS CASES(N=30)	CONTROLS (N=30)	P VALUE
MEAN AGE	29.3+/-10.1	30.4+/-6.1	0.602
MALES N , (%)	28 (93)	28 (93)	
ESR (MM/HR)	18.3 +/- 12.2	12.3 +/-5.1	0.017
CIMT (MEAN IN MM)	0.65+/-0.21	0.54+/-0.19	0.037
TOTAL CHOLESTEROL	153.6+/-38.9	146.4+/-29.7	0.424
TRIGLYCERIDES	125+/-63	113+/-66	0.456
LDL	98.3+/-44.3	94.9+/-26.1	0.669
HDL	41.3+/-11	45.3+/-10.3	0.156

Table 2. Correlation of BASDAI with lipid profile in The ankylosing spondylitis group

Pair	'r' value	P value	Significance
Cholesterol to BASDAI Index	0.515	0.004*	Positive, statistically significant correlation
Triglycerides to BASDAI Index	0.500	0.005*	Positive, statistically significant correlation
HDL to BASDAI Index	-0.627	0.000*	Negative, statistically significant correlation
LDL to BASDAI Index	0.517	0.003*	Positive, statistically significant correlation

Pearson coefficient of correlation applied. P value <0.05 was taken as statistically significant.

Discussion

Autoimmune diseases like RA and SLE are associated with an increased risk of atherosclerosis and its attending complications attributed to the chronic inflammatory state. AS is a chronic inflammatory arthropathy which has been recently associated with atherosclerosis. When this already enhanced risk of atherosclerosis is added to the risk of chronic inflammatory state in AS the prevalence of atherosclerosis in them could rise further. Our study was designed to identify the prevalence of atherosclerosis risk factors like dyslipidemia in Asian Indian AS patients. In our study, we included a total no. of 60 patients, out of which 30 cases were the patients with a known history or clinical features suggestive of AS. This study was conducted under the department of Medicine of a tertiary care centre during the period of September 2015 to February 2017. A total of 30 normal adults who were age and sex matched with the study group were taken as controls. In our study, cholesterol (r=0.515, p=0.004), Triglycerides (r=0.500, p=0.005) and LDL (r=0.517, p=0.003) was positively correlated with BASDAI and the difference was found to be statistically significant. HDL (r=0.627, p=.000) was negatively correlated with BASDAI but the difference was statistically significant. High disease activity is characterised by increased cytokine expression and this could directly lead to altered lipid levels. Lower disease activity (parameters) was associated with a more favourable lipid profile. VP van Halm et al. (2006) found that an increased BASDAI significantly (p=0.02) decreased the total cholesterol levels (regression coefficients of 20.13).[10]

Conclusion

Patients with AS have higher lipid abnormalities than shown by controls. Every effort should be made in order to control inflammation and traditional risk factors in this population, to avoid the consequences of accelerated atherogenesis. This should provide impetus to early intervention strategies to prevent accelerated atherosclerosis which would help in reducing the cardiovascular morbidity and mortality associated with this disease.

REFERENCES

1. Timms AE, Crane AM, Sims AM, Cordell HJ, Bradbury LA, Abbott A, et al. The interleukin 1 gene cluster contains a major susceptibility locus for ankylosing spondylitis. Am J Hum Genet. 2004 Oct. 75(4):587-95.
2. Anthony S. Fauci, Eugene Braunwald, Dennis L. Kasper, Stephen L. Hauser, Dan L.

Longo, J. Larry Jameson, Joseph Loscalzo Harrison's Principles of Internal Medicine, 19th Edition.
3. Amor B, Silva-Santos R. Predictive factors for the long term outcome of spodyloarthropathies. J. Rheum 1994; 21: 1883.
4. Heuft-Dorenbosch L, van Tubergen A, Spoorenberg A, et al. The influence of peripheral arthritis on disease activity in ankylosing spondylilis patients as measured with the Bath Ankylosing Spondylitis Disease Activity Index. Arthritis Rheum 2004; 51: 154-59.
5. Braun J, Pincus T. Mortality, course of disease and prognosis of patients with ankylosing spondylitis. Clin Exp Rheumatol. 2002;20(Suppl. 28):S16-S22.
6. Sokka T, Abelson B, Pincus T. Mortality in rheumatoid arthritis: 2008 update. Clin Exp Rheumatol. 2008;26(Suppl.51):S35-S61.
7. Zochling J, Braun J. Mortality in ankylosing spondylitis. Clin Exp Rheumatol. 2008;26(Suppl.51):S80-S84.
8. Han C, Robinson DW Jr, Hackett MV, Paramore LC, Fraeman KH, Bala MV. Cardiovascular disease and risk factors in patients with rheumatoid arthritis, psoriatic arthritis, and ankylosing spondylitis. J Rheumatol. 2006;33:2167-72.
9. Garrett S, Jenkinson T, Kennedy LG, Whitelock H, Gaisford P, Calin A. A new approach to defining disease status in ankylosing spondylitis: the Bath Ankylosing Spondylitis Disease Activity Index. J Rheumatol. 1994 Dec;21:2286e2291.
10. Van Halm VP, van Denderen JC, Peters MJL, et al. Increased disease activity is associated with a deteriorated lipid profile in patients with ankylosing spondylitis. Annals of the Rheumatic Diseases 2006;65:1473-1477.