# COMORBIDITIES WHEN ASSOCIATED WITH CHRONIC LOW BACKACHE ADD TO THE BURDEN OF DISEASE BY CAUSING FUNCTIONAL AND WORK DISABILITY

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## ABSTRACT

**BACKGROUND**-Various comorbidities may show positive association with CLBP including respiratory disorder, cardiovascular disease, diabetes mellitus, anemia, obesity and mental health conditions. **AIMS &OBJECTIVES**-1.To study the clinical and aetiological

profile in patients with chronic low backache 2.To study the association of various comorbidities with chronic low backache with special reference to axial spondyloarthritis. **MATERIALS AND METHODS**-Present study was a prospective one. All cases with chronic low backache >18 years were included as subjects. Those excluded were patients with acute lower backache, age < 18 years, lower backache due to trauma, congenital causes of lower backache, those with a history of spinal surgery and bed ridden patients. Disease activity of Axial Spondylitis was determined using Bath Ankylosing Spondylitis Disease Activity Index (BASDAI), Ankylosing Spondylitis Disease Activity Score (ASDAS) and the functional assessment was done using Bath Ankylosing Spondylitis Functional Index (BASFI). In addition to X-ray L-S spine, MRI L-S spine was done in all patients. Statistical analysis was done by SPSS software, version 19.**RESULTS**-Mean age of participants in this study was 46.89 years. Male to Female ratio was 2:3.Comorbidities were Hypertension in 25 (25%) Diabetes 11 (11%) COPD 9 (9%), dyslipidaemia 12 (12% hypothyroidism 3(3%), anemia 3 (3%), Coronary artery disease in 7(7%), Cerebrovascular Accident (CVA) 2 (2%), anxiety 4 (4%) and depression 2 (2%). 11 (11%) had axial spondyloarthritis, 5 (5%) osteoarthritis and 1 (1%) had rheumatoid arthritis. Axial Spondyloarthritis was significantly higher in males( P- value 0.025) and in age group less than 40 (<40 years) (P- value 0.002).There was significant association of anemia with axial spondyloarthritides(P-value 0.031). In patients with axialspondyloarthritis was significant association of BASDAI(P-value-0.003),BASFI (P-value 0.001) and ASDAS( P -Value 0.009)with comorbidities. CONCLUSION- On the basis of our study we conclude that lower back pain is a multifactorial phenomenon.

**KEYWORDS-** Chronic low back pain, Axial Spondyloarthritis, Comorbidities.

**INTRODUCTION**- Low backache is the leading cause globally to years lived with disability.Low back pain restricts mobility, interferes with normal functioning and may result in lifelong pain and permanent disability.[1]

Chronic lower back pain (CLBP) is established by the persistence of pain beyond three months even after an initial injury or underlying cause of acute low backache has been treated. Quite often the pain is non specific. The occurrence of low backache in India is alarming with nearly 60% people having suffered low back pain at sometime during their lifespan. Low back pain restricts mobility, interferes with normal functioning and may result in lifelong pain and permanent disability.[1] Low back pain is pain, muscle tension, or stiffness localized below the costal margin and above the inferior gluteal folds, with or without leg pain. Quite often the pain is non specific. Factors inducing pain to become chronic are individual factors,psychological factors or socio professional factors.[2] A standard chronic low back pain definition should include the precise description of the anatomical area, pain duration and limitation level. [3]

Axial Spondyloarthritis (AxSpA) is a condition causing painful inflammation in the spine and/or the sacroiliac joints. Spondyloarthritis (SpA) is a common, chronic progressive inflammatory arthritis of unknown etiology affecting axial skeleton, peripheral joints and extraarticular structures. This condition is characterized by new bone formation, syndesmophytes and ankylosis of joints and has a strong genetic predisposition. This condition and its associated complications are common in young adults which significantly affects the quality of life, leading to high rates or disability and unemployment. The discovery of the interleukin (IL) IL-23/IL-17 pathway revealed key molecules involved in the pathophysiology of axSpA.[4]

Comorbidities seem to be common with CLBP, indicating that at least some back problems may not be distinct entities but one of the symptoms of poor health in general. Comorbidity is any distinct additional entity that was existing or may occur during clinical course of a patient who has the index disease under study.[5] Various comorbidities includes Hypertension,

cardiovascular disease, COPD, diabetes mellitus, anemia and obesity. Mental health conditions may show positive association with CLBA.

**AIMS &OBJECTIVES**

1. To study the clinical and aetiological profile in patients with chronic low backache.
2. To study the association of various comorbidities with chronic low backache with special reference to axial spondyloarthritis.

**MATERIALS AND METHODS**

Present study was a prospective one which was conducted in J.A.Group of Hospital Gwalior in100 patients from November 2019 to June 2021. Cases of chronic low backache>18 years were included as subjects. Those excluded were patients with acute lower backache, Age < 18 years, all cases of traumatic lower backache, congenital causes of lower backache, any H/o of spinal surgery and bed ridden patients. Detailed history was taken for the presence of comorbidities and clinical examination performed. Disease activity of Axial Spondylo arthritis was determined using Bath Ankylosing Spondylitis Disease Activity Index (BASDAI), Ankylosing Spondylitis Disease Activity Score (ASDAS) and the functional assessment was done using Bath Ankylosing Spondylitis Functional Index (BASFI). In addition to X-ray L-S spine, MRI L-S spine, routine blood investigations, lipid profile,thyroid profile was done in all patients. Statistical analysis was done by chi square-test using SPSS software, version 19.

**RESULTS:**Mean age of participants in this study was 46.89 years. 30-70 years was the most common age group having chronic low back pain.Table1. Male to Female ratio was 2:3. CLBP was more common in females and in lower socioeconomic status. 11 (11%) had axial spondyloarthritis . AxSpA was found to be significantly higher among young adult male (<40 years). 66 (66%) patients were having comorbidities. According to socioeconomic status (SES) majority (45%) of study participants were in Lower Middle category and least (7%) in

upper category of SES. 84 (84%)cases had normal weight 2 (2%) were underweight 4 (4%) were obese and 10% were overweight. Table 2, Fig 1. 54 (54%) were having lower back pain for less than a year, 17 (17%) for one year 15 (15%) for two years and 14 (14%) for more than three years. 35 (35%) of cases had no comorbidity, 45 (45%) had one comorbidity,15 (15%) were having 2 comorbidities and 5 (5%) were having three comorbidities.Comorbidities were Hypertension in 25 (25%) Diabetes 11 (11%) COPD 9 (9%), dyslipidaemia 12 (12% hypothyroidism 3(3%), anemia 3 (3%), Coronary artery disease in 7(7%), Cerebrovascular Accident (CVA) 2 (2%), anxiety 4 (4%) and depression 2 (2%). Fig -2 11 (11%) had axial spondyloarthritis, 5 (5%) osteoarthritis and 1 (1%) had rheumatoid arthritis. AxSpA was significantly higher in males(P- value 0.025) and in age group less than 40 (<40 years) (P- value 0.002).There was significant association of AxSpA with anemia (P-value 0.031).Table 3. BASDAI, BASFI and ASDAS were significantly higher in patients with comorbidities with AxSpA. In patients with AxSpA there was significant association of BASDAI with comorbidities. (P- value-0.003).Similarly there was significant association of BASFI (P-value 0.001) and ASDAS(P -Value 0.009)with comorbidities in patients with AxSpA . Table:4

**Table: 1 Age wise distribution of CLBP**

| Age Group | N | % |
|---|---|---|
| 20-29 years | 13 | 13% |
| 30-39 years | 20 | 20% |
| 40-49 years | 21 | 21% |
| 50-59 year | 17 | 17% |
| 60-69 year | 22 | 22% |
| ≥70 year | 7 | 7% |
| Age[Mean±SD]:46±12.32 | | |

**Table: 2 Body Mass Index in patients with CLBP**

| BMI category | N | % |
|---|---|---|
| Underweight | 2 | 2% |
| Normal weight | 84 | 84% |
| Overweight | 10 | 10% |
| Obese | 4 | 4% |
| Total | 100 | 100% |

**Table-3 showing correlation of Axial spondyloarthritis with anemia**

| Anemia | Axial Spondyloarthritis Yes | AxialSpondyloarthritis No | P value |
|---|---|---|---|
| Present | 2 (67%) | 1 (33%) | 0.031 |
| Absent | 9 (9%) | 88 (91%) | |

**Table: 4 Association between Axial Spondyloarthritis and comorbidities in patients with lower back pain**

| Variable | Axial Spondyloarthritis | | |
|---|---|---|---|
| | With comorbidities | Without comorbidities | P Value |
| BASDAI | 5.77±1.15 | 3.34±0.77 | 0.003 |
| BASFI | 5.72±1.1 | 2.82±0.93 | 0.001 |
| ASDAS | 4.07±0.75 | 1.6±0.32 | 0.009 |

**Fig-1 Distribution of cases according to BMI**

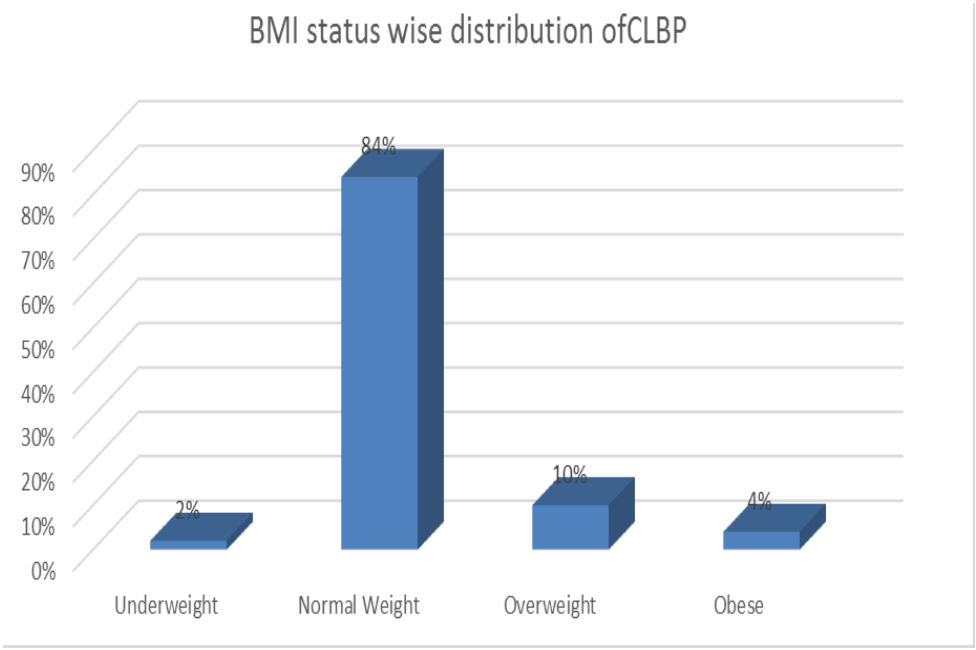
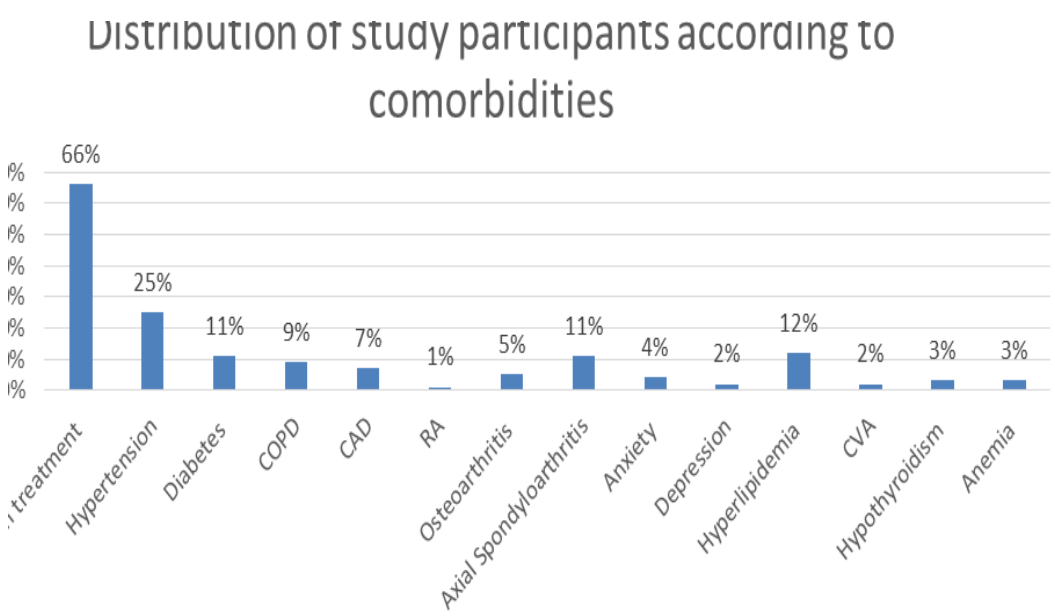
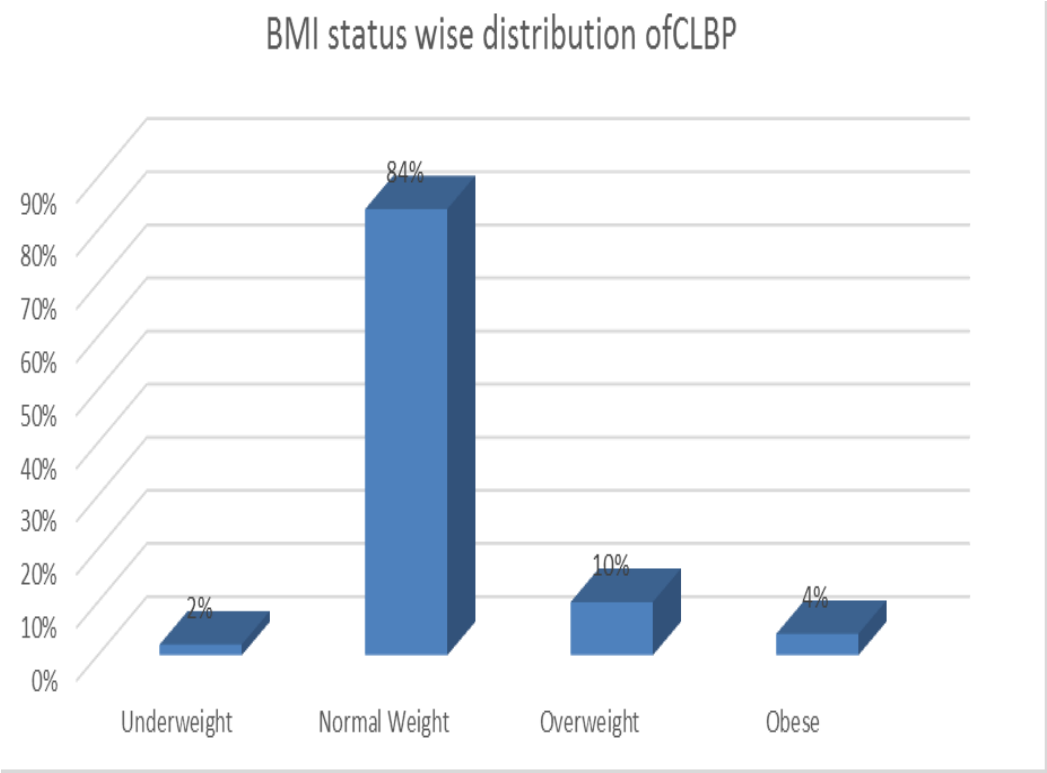



**Fig: 2 Distribution of cases according to comorbidities**




**DISCUSSION :** Low back pain ( LBP) may be related to chronic conditions or may be a symptom of poor health.[6] In this study male to female ratio was 2:3. Youngest participant was of 20 years and the oldest one was 80 years and the mean age of patients was 46.89 years (Table: 1) Chronic low back pain prevalence increases linearly from the third decade until 60 years of age, being more prevalent in women. The mechanism whereby females have higher CLBP might be attributed to exposure to musculoskeletal loads during pregnancy

and child care. Physiological characteristics such as reduced bone and muscle mass in females as well as psychological factors may also contribute to higher prevalence of CLBP in females.[6]

Socioeconomically most of the patients were in the lower middle category 45(45%), and 7(7%) in upper category. Higher prevalence of CLBP in individuals with low income and education may be related to poor living and workingconditions, and jobs that have greater risk to the lumbar spine.[3]

In the present study with regard to BMI, 2 (2%) were underweight, 10 (10%) were overweight and 4 (4%) were obese. (Table-2).Majority 84 (84%) of the cases were having normal weight Fig: 1. As per the studies overweight or obese individuals are exposed to greater loads on the lumbar spine, thus favoring the development of chronic pain.[3] High BMI are risk factors for persistent low back pain. The prevalence of low back pain was found to be higher in patients with elevated BMI .[7] These studies are not consistent with our findings.

Comorbidities add to the burden of disease by causing functional and work disability and mortality therefore management of comorbidities is equally important. LBP patients with comorbidities are less likely to receive appropriate care for LBP.[6] ref shantiraman. Hypertension was the commonest comorbidity in our study , others being diabetes, chronic obstructive pulmonary disease (COPD), coronary artery disease (CAD),Hypothyroidism, cerebrovascular accident( CVA), Dyslipidemia, anxiety, depression, rheumatoid arthritis (RA), osteoarthritis ( OA) and Anemia. Fig 2 Comorbidities are known to be associated with higher mortality and reduced quality of life.

Cases with chronic pain have an increased incidence of psychological comorbidities. Appropriate evaluation of psychiatric and psychosocial comorbidities is important to achieve desired outcome.[8] The most significant finding in a study by Ramanathan S et al was that LBP patients with comorbidities were significantly less likely to receive appropriate care for LBP.[6]

Axial spondyloarthritis was significantly higher in less than 40 years age group 8 (24%) compared to older adults more than 40 years 3 (5%) (P- value 0.002).Similarlymale gender was at significantly higher risk of Axial spondyloarthritis( P Value- 0.025%).

In axial spondyloarthritis higher body mass index was associated with worse outcomes including response to biologics.However no such association was there in our study.[9]

Comorbidities are common in ax SpA and are associated with higher disease activity and higher levels of functional impairment. Out of 11 patients of axial spondylitis 6(55%) patients were having comorbidities.

Anemia is not uncommon in ax SpA. Anemia in ax SpA in 2 (67%) emerged as an important comorbidity and there was significant association with ax SpA (P- value 0.031) in our study. Table-3

In a study, Iron deficiency anemia and anemia of chronic disease also known as anemia of inflammation were observed in patients with Ankylosing spondylitis. This can affect quality of life.[10]

In our study hypertension was the commonest comorbidity in 25(25%) but in patients with ax SpA it was 1(4%). According to Sizhengsteven et al the most prevalent individual comorbidities were hypertension (23%) and hyperlipidemia in( 17%).[11]r Similarly in our study hypertension 25(25%) was the most prevalent comorbidity in patients with CLBP followed by dyslipidemia in 12 ( 12%).

In a study by SizhengStven et al BASDI,BASFI and ASDASwas significantly raised in patients with comorbidities.[11]Table:4 Whether comorbidities influence disease activity in ax SpA is not clear. In our study BASDAI,BASFI and ASDAS all were significantly raised in patients with Axial spondyloarthritis and comorbidities. Comorbidities were associated with higher disease activity in axSpA. Clinicians should keep in mind the impact of comorbidities and consider collecting ASDAS when axSpA is associated with comorbidity.[12]

However this study had its limitations like small sample size, no control group and no facility for Vit D3 levels and HLA typing in our set up.

## CONCLUSIONS

Comorbidities when associated with chronic low backache add to the burden of disease by causing functional and work disability.CLBP is usually associated with comorbidities and therefore less likely to receive appropriate care for CLBP. Axial spondyloarthritis affects the most productive age group specially young males. Hypertension appears to be the most common comorbidity in CLBP. On the basis of our study we conclude that lower back pain is a multifactorial phenomenon with age, gender and comorbid conditions as the contributing factors. Health care provider treating CLBP need to ensure that patients with comorbidities are adequately examined, assessed and managed.

## REFERENCES

1. Ahdi GS, Subramanium R, SayaGK,Yamuna TV.Prevalence of low back pain and the relation to quality of life and disability among women in rural area of Puducherry, India. Indian J Pain 2016;30:111-5.
2. Rozenberg S Lombaljie. Chronic low back pain:definition and treatment. Rev Prat.2008; 58:265-72.
3. MeucciRD,FassaAG,FariaNMX.Prevalence of chronic low back pain: systematic review.RevSaudePublica 2015;49:73.
4. Ritchlin C.Clinical Review Axial spondyloarthritis: new advances in diagnosis and management. *BMJ* 2021; 372.
5. Valderas JM, Starfield B, Roland M.DefiningComorbidity:Implications for understanding health and health services. Ann Fam Med. 2009; 7:357-63.
6. Ramanathan. S, Hibbert. P, Wiles L. *et al.* What is the association between the presence of comorbidities and the appropriateness of care for low back pain? A

population-based medical record review study. *BMC MusculoskeletDisord* 2018; 19: 391.

7. Hashimoto Y, MatsudairaK,SawadaSS,Gando Y,Kawakami R,Kinugawa C et al.Obesity and low back pain: a retrospective cohort study of Japanese males. J PhysTherSci,2017;29:978-83.
8. Singhal K,Muliyala KP, Pakhare AP,Behera P,Santoshi JA.Do patients of chronic low back pain have psychological comorbidities?Avicenna J Med 2021.6;11:145-151.
9. Liew JW,HuangIJ, Louden DN,Singh N, Gensler LS.Association of Body mass index with disease activity in axial spondyloarthritis: review and meta analysis. RMD Open,2020;6(1):e001225.
10. Zviahina OV,Shevchuk SV,Kuvikova IP,Segeda IS. Anemia in patients with Ankylosing spondylitis, association with the activity of the inflammatory process and the severity of disease.Wiad Lek.2020;73:715-21.
11. Sizheng Steven Zhao, Selina Robertson, Tzvi Reich, Nicolas L Harrison, Robert J Moots, Nicola J Goodson, Prevalence and impact of comorbidities in axial spondyloarthritis: systematic review and meta-analysis, *Rheumatology*, Volume 59, Issue Supplement_4, October 2020, Pages iv47–iv57
12. Zhao SS,Jones GT,Macfarlane GJ, Hughes DM,Moots RJ, Goodson NJ. Association between comorbidities and disease activity in axial spondyloarthritis: results from BSRBR-AS. Rheumatology 2021;60(7):3189-3198.