

# Prediabetes & Diabetes Among Patients with Axial Spondyloarthritis

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## To cite this article:

Abu Tahir Muhammad Tanveer Hasan, Muhammad Abdul Alim. Prediabetes & Diabetes Among Patients with Axial Spondyloarthritis. *European Journal of Clinical and Biomedical Sciences*. Vol. 6, No. 6, 2020, pp. 116-119. doi: 10.11648/j.ejcs.20200606.11

**Received:** October 17, 2020; **Accepted:** November 2, 2020; **Published:** November 9, 2020

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**Abstract:** Background & Objectives: There is an increased risk of cardiovascular diseases among patients with spondyloarthritis. Coexisting diabetes mellitus can potentially add to the risk. The objective of this study was to determine the frequency of glucose intolerance in patients with spondyloarthritis. Materials & Methods: The study was conducted among 85 participants with axial spondyloarthritis who visited the Department of Rheumatology, Enam Medical College & Hospital, Savar, Dhaka, Bangladesh from September, 2018 to December, 2019. The participants underwent either oral glucose tolerance test or estimation of HbA1C. Results: The mean age of participants was 40.6 years. The majority (57.6%) of them belonged to the young age group (18-40 years). 30.6% of the participants were prediabetic. Diabetes mellitus was found to be present in 20% of the participants. There was no significant difference between the study population and the general population in terms of frequency of prediabetes. But the frequency of diabetes in the study population was higher than that in the general population. There was no significant difference between males and females with regard to the frequencies of prediabetes and DM. Diabetes mellitus was more common in the elderly age group. Conclusion: Considering the greater burden of DM among patients with axial spondyloarthritis, routine screening for DM may be indicated in these individuals.

**Keywords:** Axial Spondyloarthritis, Prediabetes, Diabetes Mellitus

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## 1. Introduction

The spondyloarthritis (SpA) family comprises ankylosing spondylitis (AS), nonradiographic axial SpA (nr-axSpA), peripheral SpA, psoriatic arthritis, SpA associated with Crohn's disease and ulcerative colitis, reactive arthritis and juvenile-onset SpA. Ankylosing spondylitis and nr-axSpA are collectively known as axial SpA [1]. The point prevalence of spondyloarthritis in Bangladesh is 1.2% [2].

The reasons for the classification of SpA into categories are both historical and practical, but each category does not necessarily represent a discrete entity - the clinical, laboratory, and imaging findings can overlap. The diagnosis and management approaches for patients suspected of having any type of SpA are also similar in general [3, 4].

The major clinical features which differentiate spondyloarthritis (SpA) from other forms of arthritis are the

distribution and type of musculoskeletal manifestations and certain extraarticular features. Patients with axial SpA characteristically have chronic low back pain. Patients with either axial or peripheral SpA can exhibit peripheral musculoskeletal features, which include dactylitis (sausage digits), enthesitis (heel pain and/or swelling), and peripheral arthritis [1]. Unilateral uveitis is a common extraarticular feature of axial spondyloarthritis [5].

In addition to having articular and extraarticular features, ankylosing spondylitis increases the risk of ischaemic heart disease and stroke [6, 7]. Similarly psoriatic arthritis increases the risk of preclinical atherosclerosis and overt cardiovascular disease [8, 9]. DM is more common among patients with psoriatic arthritis in comparison with the general population [10]. But there are not yet enough studies that assessed DM as a comorbidity in patients with axial spondyloarthritis. Our study assessed the frequencies of both prediabetes and diabetes in patients with axial spondyloarthritis visiting a tertiary-care hospital and compared the

results with those in the general Bangladeshi population.

## 2. Materials & Methods

This study was conducted in the Department of Rheumatology of Enam Medical College & Hospital, Savar, Dhaka, Bangladesh from September 2018 to December 2019. 85 patients with axial spondyloarthritis were recruited and

they underwent either oral glucose tolerance test (OGTT) or estimation of HbA1C. Diabetes mellitus and prediabetes were defined using criteria described in table 1 as per recommendations of World Health Organization (WHO) and American Diabetes Association (ADA) [11, 12]. Individuals satisfying any of the criteria for prediabetes or DM were classified into the respective category.

Table 1. Criteria for Prediabetes & Diabetes Mellitus.

Category	Fasting Plasma Glucose (mmol/L)	Plasma Glucose 2 Hours after 75g of Glucose (mmol/L)	HbA1C (%)
Prediabetes	6.1-6.9	7.8-<11.1	5.7-6.4%
Diabetes Mellitus	≥7	≥11.1	≥6.5%

## 3. Result

Ages of the participants ranged from 18 to 65 years. Their mean was 40.6 years. The participants were divided into

three groups according to their ages: young (18-40 years), middle aged (>40-60 years) and elderly (>60 years). The distribution of the participants across different age groups is outlined in figure 1.

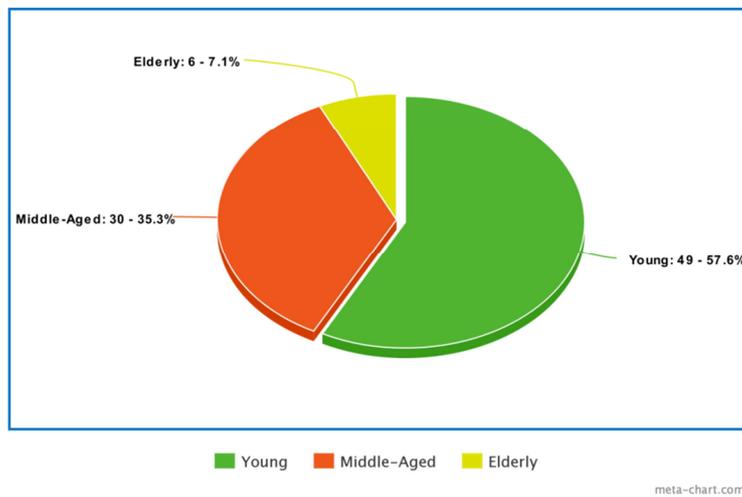


Figure 1. Distribution of the Participants across Different Age Groups.

81.8% of the participants were females and 18.8% were males. The female preponderance of the respondents may be explained by the fact that they were picked up mainly during the morning

OPD hours when most of the males have to stay in the workplace. Figure 2 below shows distribution of participants according to patterns of glucose tolerance.

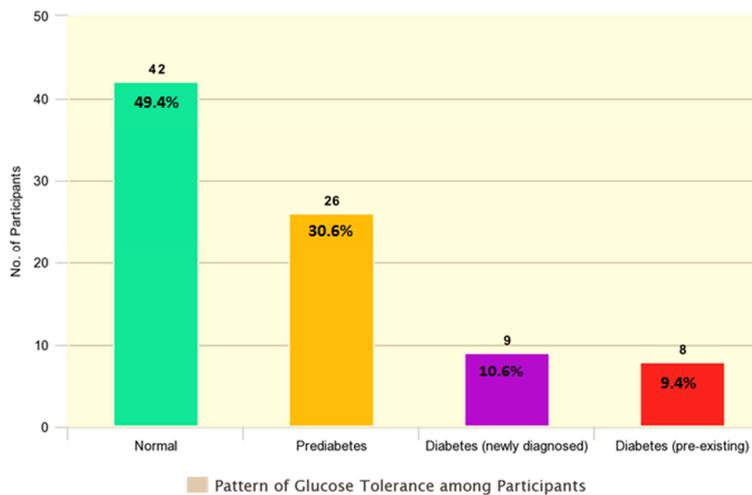


Figure 2. Pattern of Glucose Tolerance among Participants.

There was no significant difference ( $p \approx 0.1$ ) between the frequency of prediabetes in our study (30.6%) and the prevalence of prediabetes, which was about 23% according to a nationwide survey among 7541 Bangladeshi individuals [13]. On the other hand, the frequency of DM among patients with axial SpA in our study (20%) was significantly higher ( $p \approx 0.002$ ) than the national prevalence of DM, which is about 10%.

**Table 2.** Patterns of Glucose Tolerance among Males & Females.

Sex	Pattern of Glucose Tolerance		
	Normal	Prediabetes	Diabetes Mellitus
Female	35	21	13
Male	7	5	4

**Table 3.** Glucose Tolerance Patterns across Different Age Groups.

Age Group	Pattern of Glucose Tolerance			DM (Newly Diagnosed)	DM (Pre-Existing)	Total
	Normal	Prediabetes				
Young	29 (59.2%)	15 (30.6%)		3 (6.1%)	2 (4.1%)	49 (100%)
Middle-Aged	12 (40%)	11 (36.6%)		5 (16.7%)	2 (6.7%)	30 (100%)
Elderly	1 (16.7%)	0 (0%)		1 (16.7%)	4 (66.6%)	6 (100%)

So there was increasing frequency of abnormal glucose tolerance from young to elderly groups.

## 4. Discussion

Diabetes has emerged as a major public health problem worldwide, especially in low-and-middle income countries, where more than 80% of people with diabetes are living [14, 15]. The International Diabetes Federation (IDF) estimated that the global prevalence of diabetes among adults in 2013 was 8.3%, which is 382 million people living with diabetes and projected to increase beyond 592 million in less than 25 years [14]. The IDF Diabetes Atlas 5th edition projected that diabetes prevalence in Bangladesh will increase to more than 50% by next 15 years, placing Bangladesh as the 8th highest diabetic populous country in the world [15].

A nationwide survey ( $n=7541$ ) among people with Bangladesh conducted in 2011 revealed that the prevalence of prediabetes was about 23% and that of diabetes was about 10% [13]. The burden of prediabetes among axial SpA patients was similar to that in the general population, but the burden of diabetes was much higher. This greater burden of diabetes in our study population is supported by studies conducted by Chen et al showing an increased risk of diabetes among patients with ankylosing spondylitis [16]. Another study conducted by Liao et al. demonstrated higher incidence of DM among patients with ankylosing spondylitis [17].

The majority of our participants belonged to the young age group. This was in concordance with the fact that spondyloarthritis in its classical onset is generally observed in young individuals [18]. There was no difference between males and females with regard to the frequencies of prediabetes and DM as in the general population. Prediabetes was most common in middle aged individuals. The frequency

of diabetes increased across older age groups. This is in concordance with the national survey findings that also demonstrated higher burden of DM with increasing age [13].

EULAR recommends vaccination of individuals with autoimmune inflammatory rheumatic diseases (AIIRDs) including spondyloarthritis considering the increased risk of infections in these individuals resulting from an immunosuppressive effect of the underlying AIIRD and the use of immunomodulatory drugs to treat the AIIRD [19]. The risk of infections is also increased in patients with DM [20]. Moreover, both DM and ankylosing spondylitis increase the risk of cardiovascular diseases [6, 7, 21]. As our study demonstrated increased frequency of DM among patients with axial SpA, we would like to recommend routine screening of individuals in this disorder for DM as an important measure to reduce the risk of infections and cardiovascular diseases.

Table 2 shows gender wise distribution of participants across different patterns of glucose tolerance (normal/prediabetes/diabetes mellitus). 31.25% of the males were prediabetic and 25% of the females were diabetic. Among the female participants, 30.4% had prediabetes and 18.8% had diabetes. There was no significant difference between males and females with respect to the frequency of prediabetes ( $p \approx 0.95$ ) and DM ( $p \approx 0.73$ ).

Table 3 shows the patterns of glucose tolerance across different age groups.

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## 5. Conclusion

There is a greater frequency of DM in patients with axial spondyloarthritis compared with that in the general population. Routine screening for the presence of diabetes mellitus should be a part of evaluation of these individuals in the clinical settings for early detection of this comorbidity that may help to reduce the risk of infections and cardiovascular diseases, thereby optimizing health care of this group of patients.

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