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Pattern of Glucose Tolerance among Patients with Peripheral Spondyloarthritis

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Abstract

- ***Background & Objectives:***

Peripheral spondyloarthritis is a variant of spondyloarthritis which usually has a chronic course. There is an increased risk of cardiovascular diseases among patients with chronic inflammatory diseases in general. 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 35 participants with peripheral spondyloarthritis who visited the Department of Rheumatology, Enam Medical College & Hospital, Savar, Dhaka, Bangladesh from September, 2018 to January, 2020. The participants underwent either oral glucose tolerance test or estimation of HbA1C.

- ***Results:***

The mean age of participants was 43.96 years. The majority (80%) of them were young to muddle-aged (≤40 years). 22.9% of the participants were prediabetic. Diabetes mellitus was found to be present in 37.1% 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. Moreover, there was no significant difference in the frequencies of prediabetes and DM between young and middle-aged to elderly population.

- ***Conclusion:***

Considering the greater burden of DM among patients with peripheral spondyloarthritis across all age groups, routine screening for DM may be indicated in these individuals.

Keywords:- *Peripheral Spondyloarthritis, Prediabetes, Diabetes Mellitus.*

I. INTRODUCTION

The spondyloarthritis (SpA) family consists of 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. The smaller number of patients with predominantly peripheral manifestations of SpA (eg, arthritis, enthesitis, and dactylitis, rather than back and spine pain) who do not meet established classification criteria for AS, reactive arthritis, psoriatic arthritis, or SpA related to inflammatory bowel disorders can be considered as having peripheral SpA[1]. Only about 12 to 30 percent of SpA patients overall may exhibit predominantly peripheral SpA[2]. The point prevalence of spondyloarthritis in Bangladesh is 1.2%[3].

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[4, 5].

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].

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 no study has yet been conducted to assess DM as a comorbidity in patients with peripheral 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.

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II. MATERIALS & METHODS

This study was conducted in the Department of Rheumatology of Enam Medical College & Hospital, Savar, Dhaka, Bangladesh from September 2018 to January 2020. 35 patients with peripheral spondyloarthritis were recruited and they underwent either oral glucose tolerance test (OGTT) or estimation of HbA1C. The relatively small sample size was due to a small proportion of individuals with spondyloarthritis as a whole having purely peripheral involvement. 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.

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%

Table 1:- Citeria for Prediabetes & Diabetes Mellitus

III. RESULT

Ages of the participants ranged from 21 to 65 years. Mean age was 43.96 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). 80% of the participants were young to middle-aged. Figure 1 demonstrates the details of distribution of the participants across different age groups.

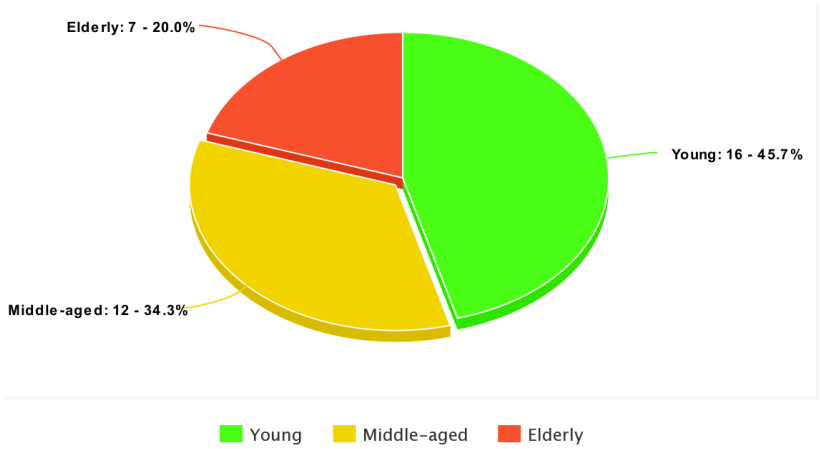

Fig 1:- Distribution of the Participants across Different Age Groups

57.1% of the participants were males and 42.9% were females. So the majority of the respondents were males.

Figure 2 below shows the pattern of glucose tolerance among participants.

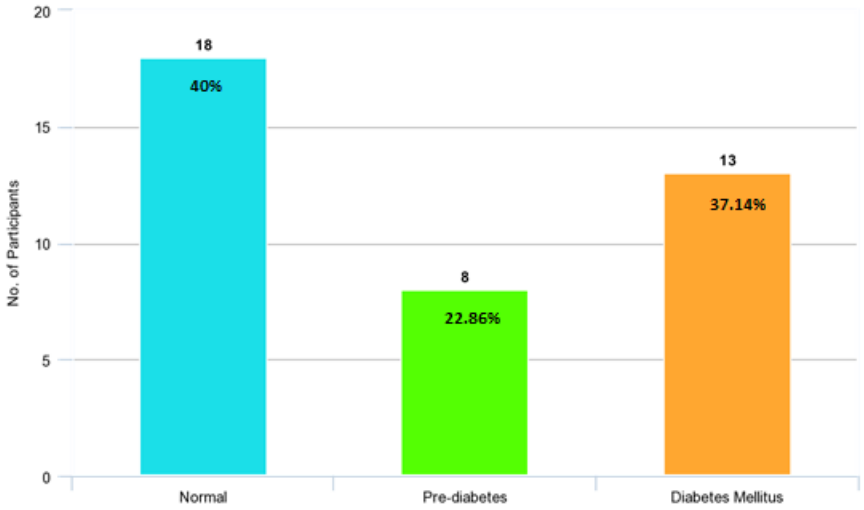

Fig 2:- Pattern of Glucose Tolerance among Participants

There was no significant difference (p≈0.98) between the frequency of prediabetes in our study (22.86%) 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 (37.1%) was significantly higher (p≈0.0001) than the national prevalence of DM, which is about 10%.

Table 2 shows gender wise distribution of participants across different patterns of glucose tolerance (normal/prediabetes/diabetes mellitus).

Sex	Pattern of Glucose Tolerance		
	Normal	Prediabetes	Diabetes Mellitus
Female	5	4	6
Male	9	4	7

Table 2:- Patterns of Glucose Tolerance among Males & Females

20% of the males were prediabetic and 35% of the males were diabetic. Among the female participants, 26.67% had prediabetes and 40% had diabetes. There was no significant difference between males and females with respect to the frequency of prediabetes (p≈1.00) and DM (p≈0.7).

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

Age Group	**Pattern of Glucose Tolerance**			**Total**
	Normal	**Prediabetes**	**DM**	
Young (18-40 years)	9 (56.25%)	3 (18.75%)	4 (25%)	16 (100%)
Middle-Aged to Elderly (>40 years)	5 (26.31%)	5 (26.31%)	9 (47.37%)	19 (100%)

Table 3:- Glucose Tolerance Patterns across Different Age Groups

There was no significant difference between young-aged and middle-aged to elderly groups in terms of frequencies of prediabetes (p≈0.7) and diabetes (p≈0.29).

IV. DISCUSSION

Diabetes is a major public health problem worldwide, especially in low-and-middle income countries, where more than 80% of people reside[14, 15]. According to the estimate of International Diabetes Federation (IDF), 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 the prevalence of Bangladesh will rise to more than 50% by next 15 years and that will place Bangladesh as the 8th highest diabetic populous country in the world[15].

A nationwide survey (n=7541) among people in Bangladesh conducted in 2011 revealed that the prevalence of prediabetes was about 23% and that of diabetes was about 10%[13]. The frequency of prediabetes among peripheral SpA patients was similar to that in the general population, but the burden of diabetes was much higher. Although there has been no such study so far on patients with peripheral spondyloarthritis, similar findings were observed in patients with ankylosing spondylitis. For instance, Liao et al. demonstrated higher incidence of DM among patients with ankylosing spondylitis[16]. Another study conducted by Chen et al showed an increased risk of diabetes among patients with ankylosing spondylitis[17].

The majority of our participants were young to middle-aged as expected[18]. There was no difference between males and females with regard to the frequencies of prediabetes and DM as in the general population[13]. In contrast with the greater prevalence of prediabetes and DM in the middle-aged to elderly people from the general population, our sudy showed similar frequencies of prediabetes and DM across young and middle-aged to elderly groups[19, 20]. This may be indicative of an increased risk of developing prediabetes and diabetes in young patients with peripheral spondyloarthritis in comparison with the general young population.

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[21]. The risk of infections is also increased in patients with DM[22]. Moreover, both DM and chronic inflammatory diseases increase the risk of cardiovascular diseases[23, 24]. As our study demonstrated increased frequency of DM among patients with axial SpA, we would like to recommend routine screening of individulas in this disorder for DM as an important measure to reduce the risk of infections and cardiovascular diseases.

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V. CONCLUSION

There is a greater frequency of DM in patients with peripheral 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.

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