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Research Article

Association between Physical Activity and Diabetes Mellitus in Perimenopausal Women in an Urban Slum of Mumbai

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Abstract: This study has been undertaken to find association between physical activity and diabetes mellitus in perimenopausal women in an urban slum of Mumbai. The cross-sectional community-based descriptive epidemiological study was conducted in slum area during the period of January 2012 to June 2013. Out of 61 Diabetes mellitus patients, 83.6% were having sedentary physical activity, 16.4% were having moderate physical activity. Out of 389 nondiabetic subjects, 68.2% were having sedentary physical activity, 25.9% were having moderate physical activity and 5.9% were having heavy physical activity. There was significant statistical association between physical activity and diabetes mellitus among perimenopausal women in an urban slum.
Keywords: diabetes mellitus, physical activity, perimenopausal women

INTRODUCTION

Diabetes mellitus is an 'ice-berg'disease. Diabetic patients, if undiagnosed and inadequately treated, develop multiple chronic complications leading to irreversible disabilities and death. More than 90% of the cases of Diabetes mellitus are type 2 Diabetes mellitus [1].

India is currently experiencing an epidemic of diabetes mellitus [2]. Data available shows rising pattern in the prevalence of type 2 Diabetes mellitus in India both in urban as well as rural areas. The population in India has an increased susceptibility to Diabetes mellitus.

Factors responsible for development of type 2 Diabetes mellitus are age, familial and genetic ethnicity, obesity, physical inactivity, diet, smoking, socioeconomic status, high blood pressure and high cholesterol, history of gestational diabetes.

Early detection and appropriate treatment are the cornerstones for delaying the onset and progression of the diabetic complications. It is therefore particularly important that recognition and management of multiple risk factors should be a primary goal in comprehensive preventive care.

Studies suggest that Diabetes mellitus is no longer a disease of the affluent or rich man's disease. It is becoming a problem even among the middle income and poorer sections of the society. Studies also have shown that the poorer diabetic subjects are prone to complications as they have little access to quality health care.

As per U. N. Population Report (by Mid-year 2001), India's urban slum population is estimated at 158.42 million [4]. Such large population always goes ignored. It is therefore important that effort should be made for recognition of multiple risk factors to reduce diabetic complications.

The decline in estrogen concentrations at the menopause has some adverse effects. The changes occurring at or after the menopause are increased insulin resistance, decreased insulin secretion, decreased insulin elimination and increased android fat distribution [3].

Few community studies have been conducted in the perimenopausal age group with varying definitions of perimenopausal age. For the present study, the perimenopausal age was considered to be 40-50 years [5].

Taking into consideration the above factors, a study has been undertaken to find association between family history of Diabetes mellitus and Diabetes mellitus among perimenopausal aged women in an urban slum.

MATERIALS AND METHODS:

Administrative approvals:

The necessary approvals were obtained from the following authorities to carry out the study.

- The Dean of Parent Medical College.
- Ethics committee of Parent Medical College
- Professor and Head, Department of Community Medicine, Parent Medical College.
- In-Charge of the Urban Health Centre.

Study area:

The study was conducted at an urban slum Shivaji nagar which is a field practice area of Department of Community Medicine of Topiwala National Medical College, Mumbai. This slum consists of 50 plots (1 to 42, 43, 43A, 44 to 49).Each plot is divided into two parts. Each part has 10 lines, these lines are numbered from A to K (except I) on left side and from L to U on right side. Each line has 9 houses numbered from 1 to 9.Total 180 houses are there in each plot. Total population of study area is approximately 84,783.

Study design:

The present study is a cross-sectional community-based descriptive epidemiological study.

Duration of study:

The Study was conducted during the period of January 2012 to June 2013.

Calculating Sample size:

- Total population of study area was 84,783.
- Female population between 40 to 50 years was 10.1%3.
- So, female population between 40 to 50 years in study area was 8,563. (Applying national demographic parameters)[1].
- Taking 5% of perimenopausal women of 40 to 50 years = 428.15
- It was divided among 50 plots equally – 428.15/50 = 8.56 = 9.
- So, 450 perimenopausal women were included in the study.

From each plot, with the help of systematic random sampling method every 20th house was selected for the study, with a random start. All the females in age group 40 to 50 years in selected households were included for the study, till the sample size was met

Females who were not aware about their diabetic status were screened at Urban Health Centre for fasting blood glucose level and oral glucose tolerance test[6] by semiautoanalyser. In the remaining females who had reported physician diagnosis of Diabetes mellitus, the diagnosis was further confirmed by checking for one of the evidence of disease like blood sugar report, medical record or prescription from physician or medicines.

Physical activity:

Physical activity [7] was categorized as:

a) Sedentary-sitting, standing, and driving for most of the day, cooking, light cleaning, light yard work, slow walking and other major activities that involve sitting.

b) Moderate- an occupation that includes lifting, lots of walking or other activities that keep people moving for several hours qualified as moderately active.

c) Heavy-heavy manual labour, a very active lifestyle, dancer or very active sports played for several hours almost daily, an elite athlete in training or an extremely active lifestyle-both at work and at play and sport or activity last for several hours, almost daily.

Statistics-chi-square test

RESULTS

Out of 450 subjects, 316 (70.2%) were having sedentary physical activity, 111 (24.7%) were having moderate physical activity and 23 (5.1%) were having heavy physical activity.

Out of 61 Diabetes mellitus patients, 51 (83.6%) were having sedentary physical activity, 10(16.4%) were having moderate physical activity.

Out of 389 nondiabetic subjects, 265 (68.2%) were having sedentary physical activity, 101(25.9%) were having moderate physical activity and 23 (5.9%) were having heavy physical activity. There was significant association between physical activity and Diabetes mellitus as the p value < 0.05.

Table 1: Association between Physical activity and Diabetes mellitus in the study subjects:

Physical Activity		Diabetic	Nondiabetic	Total
Sedentary	N	51	265	316
	%	83.6	68.2	70.2
Moderate	N	10	101	111
	%	16.4	25.9	24.7
Heavy	N	0	23	23
	%	0	5.9	5.1
Total	N	61	389	450
	%	100	100	100

Chi-Square =7.365, df =2, p value= 0.025.

DISCUSSION

In this study out of 61 diabetes mellitus patients, 51 (83.6%) were having sedentary physical activity, 10 (16.4%) were having moderate physical activity. There was significant association between physical activity and Diabetes mellitus (p=0.025)

Similar results were obtained in the studies done by Bharati *et al.;* [8] , Ahmad *et al.;* [9] (p=0.010), Baijayanti Baur *et al.;* [10] (p < 0.01).

However, the study by Singh *et al.;* [11] (p=0.187), Megerssa et al[12] did not show any significant difference between physical activity and Diabetes mellitus.

The predominant sedentary life style of the subject could have possibly contributed towards gain in body weight which in turn made them prone to develop Diabetes mellitus.

CONCLUSION

There was significant statistical association between physical activity and diabetes mellitus among perimenopausal women in an urban slum.

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