



Consumption of Sweets as a Risk Factor for Diabetes Mellitus among Adults in Odisha- A Cross-sectional Study

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Authors' contributions

This work was carried out in collaboration between both authors. Author SS designed the study, performed the statistical analysis, wrote the protocol and approved the final draft of the manuscript. Author GIP wrote the first draft of the manuscript, managed the literature searches. Both authors read and approved the final manuscript.

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Short Communication

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ABSTRACT

Background and Objectives: India is the diabetic capital of world. Though many have reported prevalence in various states of India, there is paucity of reports from Odisha where a lot of sweets and desserts are produced locally. This research project was designed to screen apparently healthy population using simple measures to diagnose and score risk for diabetes mellitus in different working-class categories of Odisha.

Methods: A cross-sectional study was conducted among 150 randomly selected non-diabetic adults (18-50 years) with 50 subjects each in sedentary, moderate and heavy workers group. The Indian Diabetes Risk Score (IDRS) was calculated for each subject. The association of diabetes with sweet intake, physical activity and anthropometric measurements were calculated using relative risk ratio individually.

Results: 16% were with high risk and 46% were at a moderate risk among sedentary workers. In

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moderate workers group, 12% were at high risk and 44% were at moderate risk. Among heavy workers population, there was none in a high-risk category and only 12% were found to have a moderate risk. The relative risks of people consuming sweets with IDRS score >30 (with risk) were 1.25, 1.07 and 0.54 in sedentary, moderate and heavy workers respectively.

Interpretations and Conclusions: The proportion of sweets intake, reduced physical activity and significant family history were associated with diabetic risk. Educating the population about diets having low glycaemic index and incorporating healthy food and exercise as a habit will go a long way in abetting the rising incidence of diabetes.

Keywords: Adults; diabetes mellitus; India; risk; sweets.

1. INTRODUCTION

Diabetes Mellitus is the most predominant chronic Non- Communicable Disease (NCD) in India. Epidemiological studies show a significant and escalating burden of type 2 diabetes in India. This rise in prevalence is attributed to rapid urbanization, lifestyle modifications and risk factors like obesity, dyslipidemia, tobacco use and hypertension [1]. In any Indian state where the proportion of the rural population is quite high, awareness on Diabetes and its control measures is low, therefore most of the cases are left undiagnosed. Studies in India have shown that 12- 18% population in urban areas and 3-6% population in the rural area are having diabetes [2-7]. Most alarming fact is that the incidence of diabetes is increasing fast among rural population and also in younger age group.

In Odisha, a lot of sweets and desserts are produced locally and form a regular feature with meals. The increased consumption of rice, potatoes, sweets and other carbohydrate-rich foods than any other part of India highly supplements to the risk of diabetes [8]. Though many have reported prevalence in various states of India, there is a paucity of reports from Odisha.

This cross-sectional research project was designed to screen an apparently healthy population of Odisha using simple measures like the Indian Diabetes Risk Score (IDRS) [9] to score risk for diabetes mellitus in different working-class categories of Odisha.

2. MATERIALS AND METHODS

This study was conducted under the department of Biochemistry, AIIMS, Bhubaneswar, Odisha.

Study Population: The 3 groups were classified according to their physical activity as heavy,

moderate and sedentary. 50 non-diabetic adults for each group between ages 18-50 years of both sexes were recruited for the study after obtaining their written consent. They were screened using questionnaire.

The Indian Diabetes Risk Score (IDRS) [9] was calculated for each subject from the questionnaire filled during his or her visit to the clinic or on our visit to survey site.

Subjects with an IDRS of <30 were categorized as low risk, 30-50 as medium risk and those with > 60 as high risk for diabetes.

The results of the IDRS obtained were compared. The association of diabetes with sweet intake, physical activity and anthropometric measurements were calculated using relative risk ratio individually.

3. RESULTS

The general characters (Table 1) of each group are similar in all parameters except that the IDRS score is markedly increased in the sedentary workers among both the genders as compared to the moderate and heavy workers. There is a higher consumption of sweets among heavy workers (Fig. 1) as compared to the other groups. A number of adults consuming sweets regularly are found to be high in the sedentary population (98%) followed by moderate (70%) and heavy workers (49%) with relative risks of developing diabetes mellitus as 1.25, 1.07 and 0.54 respectively in each group (Table 2). A number of adults consuming biscuits and cakes is high in the sedentary group followed by moderate and heavy workers with relative risks 0.92, 1.15, 0.61 respectively in each group (Table 3). 62% of people under risk of diabetes (moderate and high risk) based on IDRS scores are among sedentary workers who contribute to a total of 48% of total population (Table 4).

Table 1. General characteristics in the 3 groups

		General characteristics in the 3 groups		
		Sedentary	Mild to Moderate	Heavy worker
Age	M	28.87 ± 8.94	36.02 ± 7.31	31.78 ± 6.78
	F	23.33 ± 5.32	38 ± 7.76	32.67 ± 2.50
Sex (n)	M	41	42	41
	F	9	8	9
Weight (kg)	M	71.06 ± 10.6	65.57 ± 5.65	70.83 ± 9.12
	F	56.44 ± 4.67	60.13 ± 14.8	59.56 ± 4.72
Height(m)	M	1.69 ± 0.08	1.66 ± 0.05	1.69 ± 0.07
	F	1.59 ± 0.05	1.58 ± 0.06	1.5 ± 0.03
BMI	M	24.79 ± 3.46	23.82 ± 2.15	24.98 ± 3.38
	F	22.35 ± 2.18	23.88 ± 5.02	23.67 ± 1.84
Waist(cm)	M	87.90 ± 8.71	88.57 ± 6.7	88.85 ± 4.22
	F	82.78 ± 6.69	86.25 ± 14.33	81.22 ± 5.47
Hip(cm)	M	96.98 ± 7.72	94.43 ± 6.22	94.39 ± 5.48
	F	95.94 ± 5.29	95.38 ± 19.57	86.00 ± 6.52
IDRS score	M	42.20 ± 12.75	38.33 ± 13.42	17.07 ± 13.65
	F	42.22 ± 8.33	38.75 ± 18.85	11.11 ± 11.67

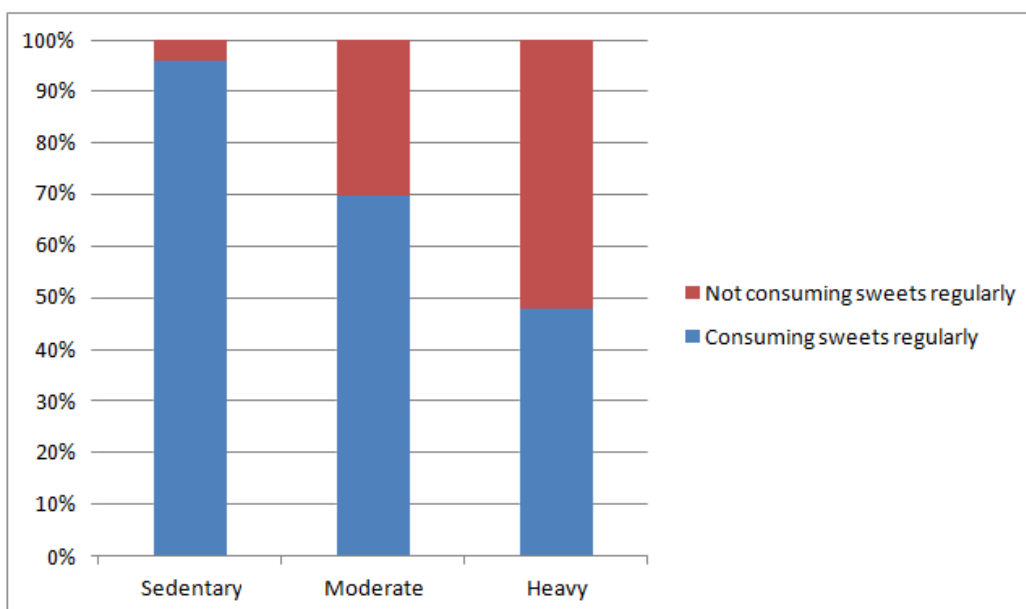


Fig. 1. Proportion of each group consuming sweets

Table 2. Relative risk of developing DM in each group on consumption of sweets

	IDRS >30	IDRS <30
Sedentary workers		
Consuming sweets	30	18
Not consuming sweets	1	1
Mild to moderate workers		
Consuming sweets	20	15
Not consuming sweets	8	7
Heavy workers		
Consuming sweets	2	22
Not consuming sweets	4	22

Table 3. Relative risk of developing DM in each group on consumption of other refined carbohydrates

	IDRS>30	IDRS<30
	Sedentary workers	
Consuming biscuits and cakes	29	18
Not consuming biscuits and cakes	2	1
	Mild to moderate workers	
Consuming biscuits and cakes	22	16
Not consuming biscuits and cakes	6	6
	Heavy workers	
Consuming biscuits and cakes	3	28
Not consuming biscuits and cakes	3	16

Table 4. Comparison of IDRS among the groups

IDRS	Sedentary workers	Mild to moderate workers	Heavy workers
≥60	8	6	0
=50	12	13	1
=40	11	9	5
≤30	19	22	44

4. DISCUSSION

In our investigation, out of 50 subjects in each category, 16% are with high risk and 46% are at a moderate risk among sedentary workers accounting to a total of 62% with risk of having diabetes. In moderate workers group, 12% are at high risk and 44% are at moderate risk accounting to a total of 56% with risk of having diabetes. Among heavy workers population, there is none in high risk category and only 12% are found to have a moderate risk. This suggests a strong association of sweets with diabetic risk. This is in concordance with a study conducted in Delhi among urban population using IDRS parameters [10]. Consumption of sweets is not absolute as sweets intake can be in the form of biscuits and cakes too as is evident from our study.

Family history is also a highly significant risk factor. As per our study, percentage of people with at least one parent being diabetic is almost the same in sedentary and moderate workers group, 20% and 22% respectively. However, this is around 50% in heavy workers population. A plausible explanation for this trend could be work related stress factors and/ or their socioeconomic status. There could be other causes not investigated in our study like autoimmune as seen in lean diabetics or viral or pollutants and adulterants in food. Similar study done showed that the IDRS is a good screening tool with sensitivity of 95.12% and specificity of 28.95% in individuals with score >60 [11].

The limitations of our investigation include the cross-sectional nature of study, lack of consideration of dietary patterns and small group of population. Although there was no calculation for the minimum required sample size, the number of subjects used in this study is comparable to that used in another study (11). Dietary data were self-reported and may lend some biases to the evaluation of individual food groups; however, overall pattern still reflects the trends in consumption.

5. CONCLUSION

In conclusion, the results showed that sweets intake, reduced physical activity and significant family history enhanced the diabetic risk.

CONSENT

As per ICMR guidelines and IEC permission the patients' written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

As per international standard or university standard written ethical permission has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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