

Research Article

A STUDY ON RISK FACTOR PROFILE OF HYPERTENSION AND DIABETES AMONG INDUSTRIAL WORKERS OF SOUTH INDIA

Pravin N Yerpude ¹, Keerti S Jogdand ²^{1,2}Dept of Community Medicine, Gujarat Adani Institute of Medical Sciences, Bhuj-370001, Gujarat, India.

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Corresponding Author:

Dr Pravin N Yerpude,
Associate Professor, Dept of
Community Medicine, Gujarat Adani
Institute of Medical Sciences, Bhuj-
370001, Gujarat, India

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ABSTRACT

Introduction: In India, 53% of all the deaths and 44% of all DALYs are caused by non communicable diseases (NCDs) especially cardiovascular diseases (CVDs), cancer and type 2 Diabetes Mellitus (DM). Major causes for the increase in cases of non communicable diseases are dyslipidaemia, overweight, obesity, physical inactivity and tobacco use. Recently, in industrial populations in various parts of India, there are reports of high prevalence of cardiovascular risk factors among them. Therefore the present study was conducted with the objective of identifying the risk factors of Hypertension and Diabetes among industrial workers of South India

Materials and methods: A cross sectional study was undertaken between March 2010 and October 2010 in one of the industries with permanent employee strength of 168. All of them were included for the study. Ethical clearance was obtained from the Institutional Human Ethics Committee. Informed consent was obtained from the study subjects. The study comprised of Questionnaire capturing information on age, socio economic status and nature of work, details on risk factors like tobacco use, physical activity, family history of hypertension, diabetes.

Results: The study population consisted of 151 (89.88%) males. Majority (73%) were educated up to higher secondary/ high school and 118 (79%) were employed in nonprofessional capacities. Common risk factors for non communicable diseases in industrial workers were overweight/obese (38.69%), tobacco use (36.31%), increase waist circumference (35.12%). Prevalence of Hypertension and Diabetes in industrial workers was 32.14% and 25.60% respectively. Association of risk factors like age > 45 yrs, family history, being overweight /obese and increase waist circumference was found to be statistically significant with Hypertension and Diabetes.

Conclusion: The results could help to motivate industries to initiate lifestyle modifications and health promotion programs for the prevention and control of non communicable diseases and reiterating some of the already known facts that could go in for policy recommendations in the industrial settings.

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INTRODUCTION

In India, 53% of all the deaths and 44% of all DALYs are caused by non communicable diseases (NCDs) especially cardiovascular diseases (CVDs), cancer and type 2 Diabetes Mellitus (DM). ¹ Major cause for the increase in cases of non communicable diseases is dyslipidaemia, overweight, obesity, physical inactivity and tobacco use. ² Recently, in industrial populations in various parts of India, there are reports of high prevalence of cardiovascular risk factors among them. ³ According to the sentinel surveillance conducted in 10 industries across India, the industrial population has a high burden of CVD risk factors, which is a major cause of death in India.² Therefore the

present study was conducted with the objective of identifying the risk factors of Hypertension and Diabetes among industrial workers of South India. The results could help to motivate industries to initiate lifestyle modifications and health promotion programs for the prevention and control of CVDs.

MATERIALS AND METHODS

Guntur is a heavily industrialized city in Andhra Pradesh with textile factories, engineering firms, automobile and motor parts manufacturers, etc. A cross sectional study was undertaken between March 2010 and October 2010 in one of the industries with permanent

employee strength of 168. All of them were included for the study. Ethical clearance was obtained from the Institutional Human Ethics Committee. Informed consent was obtained from the study subjects. The study comprised of Questionnaire capturing information on age, socio economic status and nature of work, details on risk factors like tobacco use, physical activity, family history of hypertension, diabetes.

Weight was measured to the nearest 0.5 kg using the bathroom scale. Height was calculated to the nearest 0.5 cm using a portable stadiometer. Body mass Index (BMI) was calculated by dividing observed weight by height in squared meter (kg/m²). Waist circumference was measured using a non stretchable measuring tape at the narrowest point between lower end of rib cage and iliac crest. Blood pressure was measured in the right upper arm is sitting posture. Fasting and post-prandial blood sugars were checked using capillary glucose method. The subjects were requested to come after an overnight fasting of minimum 8 hours for measuring Fasting blood sugar. Post-prandial blood sugar was taken after one and a half hours of food intake. The diagnosis of diabetes mellitus was based on the American Diabetes

Association (ADA) definition.⁴Hypertension was diagnosed based on drug treatment for hypertension or if the blood pressure was >140 mmHg systolic and/or 90 mm Hg diastolic (JNC-7 criteria) measured on two occasions 15 minutes apart.⁵ Physical activity was assessed using close-ended questions probing self-perceived, self-reported type (occupational, domestic, leisure time and transport related) during the past 5 years. The intensity of physical activity was classified as 'very light' (walking, job involving desk work, watching television), 'light' (standing all day working, housework such as cooking, cleaning in the house), 'moderate' (gardening, agricultural work, walking long distances up and down hills, climbing more than 20 steps in a day) and 'heavy' (lifting heavy weights, construction work, manual labor and running). WHO cut off values were used for classifying BMI. ⁶ Waist circumference defined as > 90 cm for men and >80 cm for women. ⁷ Statistical analyses was done using SPSS-11.5 version and Chi-square test was used to see the association between the risk factors and the non communicable diseases.

RESULTS

The study population consisted of 151 (89.88%) males. Majority (73%) were educated up to higher secondary/ high school and 118 (79%) were employed in nonprofessional capacities.

Common risk factors for non communicable diseases in industrial workers were overweight/obese (38.69%), tobacco use (36.31%), increase waist circumference (35.12%). Prevalence of Hypertension and Diabetes in industrial workers was 32.14% and 25.60% respectively. Association of risk factors like age > 45 yrs ,family history, being overweight /obese and increase waist circumference was found to be statistically significant with Hypertension and Diabetes.

DISCUSSION

The risk factors of today can manifest as diseases of tomorrow. The present study revealed a high prevalence of NCD risk factors among the industrial workers of Guntur which indicates the influence of epidemiological and nutritional transitions in the industrial settings. Tobacco use among 36.31% of the employees is consistent with that

of other studies in the industrial setting ^{1,2, 3} Obesity/overweight was seen among 38.69% of the employees and similar findings were found in other studies in the industrial settings ^{1,2,3} Similar finding on Central obesity was seen in other studies ^{2, 3} whereas one study revealed a whopping figure of 70%. ¹

Prevalence of Hypertension was found to be 32.14% which is lesser than the finding of the study at Baroda. ¹ Pre-hypertension and hypertension were prevalent in 39.8% and 27.2% subjects respectively in a study from Chennai. ³ Prevalence of Diabetes in present study was found to be 25.60% % which is more than the finding of the study at Chennai(16.3%).³ Our study showed a statistically significant association of Hypertension and Diabetes with increased waist circumference,being overweight/obese .Similar results were find in a study conducted among industrial workers in South India.⁸So the high prevalence of non communicable disease risk factors in Indian industrial settings as a cause of concern as well as an opportunity for carrying out work place interventions. Our results reiterate the need for workplace interventions. We made recommendations to the management of the industry that included health education programme to increase awareness about healthy lifestyle and to motivate sedentary employees to participate in sports and other physical fitness programmes. In addition, we recommended periodic follow-up of the employees with hypertension and diabetes at the Rural Health Centre, which is attached to our institution.

Table 1: Risk factors for Non communicable diseases among industrial workers (n=168)

Risk factors	No (%)
Age > 45 yrs	56(33.33%)
Family history of Diabetes Mellitus	43(25.60%)
Family history of Hypertension	38(22.62%)
Sedentary work	29(17.26%)
Use of tobacco	61(36.31%)
Overweight/obese	65(38.69%)
Increase waist circumference	59(35.12%)

Table 2: The prevalence of Hypertension and Diabetes among industrial workers

Prevalence	No (%)
Diabetes Mellitus	43(25.60%)
Hypertension	54(32.14%)

Table 3: The association between various risk factors and Diabetes Mellitus

Risk factors	Presence of Diabetes		Chi square test
	Yes	No	
Age			
< 45 yrs	5(11.63%)	51(40.8%)	X ² =12.25 df=1 P < 0.0005 S
> 45 yrs	38(88.37%)	74(59.2%)	
Family h/o of DM			
Yes	26(60.47%)	17(13.6%)	X ² =36.89 df=1 P < 0.0001 S
No	17(39.53%)	108(86.4%)	
Occupation			
Sedentary	9(20.93%)	20(16.1%)	X ² =0.54 df=1 P > 0.46 NS
Non sedentary	34(79.07%)	105(84%)	
B.M.I.			
Normal	19(44.19%)	84(67.2%)	X ² =7.14 df=1 P < 0.0075 S
Overweight/obese	24(55.81%)	41(32.8%)	
Waist circumference			
Normal	15(34.88%)	94(75.2%)	X ² =22.82 df=1 P < 0.0001 S
Increased	28(65.12%)	31(24.8%)	

CONCLUSION

The results could help to motivate industries to initiate lifestyle modifications and health promotion programs for the prevention and control of non

communicable diseases and reiterating some of the already known facts that could go in for policy recommendations in the industrial settings.

Table 4: The association between various risk factors and Hypertension

Risk factors	Presence of Hypertension		Chi square test
	Yes	No	
Age			
< 45 yrs	19(35.19%)	93(81.58%)	$X^2=35.49$ df=1 P < 0.0001 S
> 45 yrs	35(64.81%)	21(18.42%)	
Family h/o of Hypertension			
Yes	29(53.70%)	9(7.89%)	$X^2=43.93$ df=1 P < 0.0001 S
No	25(46.30%)	105(92.11%)	
Occupation			
Sedentary	13(24.07%)	16(14.04%)	$X^2=2.58$ df=1 P > 0.10 NS
Non sedentary	41(75.93%)	98(85.96%)	
B.M.I.			
Normal	21(38.89%)	82(71.93%)	$X^2=16.86$ df=1 P < 0.0001 S
Overweight/obese	33(61.11%)	32(28.07%)	
Waist circumference			
Normal	25(46.30%)	84(73.68%)	$X^2=12.06$ df=1 P < 0.005 S
Increased	29(53.70%)	30(26.32%)	

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