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High prevalence of cardiometabolic risk factors in young employees of Information Technology industry

Abstract

Background: We assessed the burden of cardiometabolic risk factors in Information Technology (IT) employees as they are exposed to adverse lifestyle. **Materials and Methods:** In this cross-sectional study, health records were obtained from two IT industries in Pune. Prevalence of cardiometabolic risk factors [hyperglycemia, high blood pressure (BP), hypertriglyceridemia, high low-density lipoprotein (LDL)-cholesterol, low high-density lipoprotein (HDL)-cholesterol, and overweight/obesity] was determined using standard cutoffs. We also examined clustering of risk factors (\geq two risk factors). **Results:** Data were available on 1,350 of 5,800 employees (mean age: 33 ± 6 years, 78% men). Prevalence of diabetes and hypertension was 2.5% and 13.5%, respectively. Prevalence of prediabetes, borderline high BP, hypertriglyceridemia, high LDL-cholesterol, low HDL-cholesterol, and overweight/obesity was 6.5%, 20.3%, 21%, 22.1%, 70.1%, and 51.4%, respectively. Risk factor clustering was observed in 63.5% that increased with age ($P < 0.001$). **Conclusion:** Given the high burden of risk factors at relatively young age, spreading awareness and promoting healthy lifestyle through workplace interventions are warranted.

Key words: Cardiometabolic risk factors, information technology industry, prevalence, Pune, sedentary workers

INTRODUCTION

The epidemic of type 2 diabetes (T2D) and other cardiometabolic diseases is escalating worldwide including India.^[1] The recent

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and rapid socioeconomic transition in India is believed to have contributed to this rise with individuals being increasingly exposed to energy-dense diets, high stress levels, and sedentary work habits.^[1,2]

In recent years, the number of Information Technology (IT) Industries in India has increased exponentially and this sector has seen considerable economic growth.^[3] The proportion of young people working in IT industries is rising rapidly.^[4] In addition to sedentary work style, IT employees are also exposed to unhealthy eating habits and high stress levels.^[5] This has significant public health implications for future as the burden of cardiometabolic disease may affect young and economically productive age groups.

Previously it has been shown that there is high burden of cardiometabolic risk factors among industrial populations across India^[6] but there is no specific data on the employees of IT industry. We therefore decided to assess the prevalence and distribution of cardiometabolic risk factors in IT employees.

MATERIALS AND METHODS

We approached two IT industries in Pune where voluntary health checks were conducted annually. We contacted the managements of the respective industries and obtained health check data for the year 2011–2012. This was the preliminary phase of our proposed prevention program targeting IT industry employees. The study was approved by the Ethics Committee of the KEM Hospital Research Center, Pune.

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To preserve confidentiality, the data were obtained anonymously. Individuals were identified with a unique reference number. The data contained records of anthropometry (height, weight), blood tests (hemoglobin, fasting and 2-h post meal plasma glucose, and fasting lipid profile), and BP. Height was measured on a wall-mounted stadiometer to the nearest 0.1 cm. Weight was measured on a digital scale to the nearest 0.1 kg. Body mass index (BMI) was calculated as a ratio of weight in kilograms and square of height in meters (kg/m^2). BP was measured in the sitting position using a digital recorder. Blood was obtained in the fasting state and 2 h after a meal. Blood analyses were conducted in two standard accredited laboratories using identical assays and methods. Cutoffs mentioned by both these laboratories were the same; hence, it was possible to combine the data for comparison. The following six cardiometabolic risk factors were studied:

1. Overweight ($\text{BMI} \geq 25 < 30 \text{ kg}/\text{m}^2$) or obesity ($\text{BMI} \geq 30 \text{ kg}/\text{m}^2$)—World Health Organization (WHO) criteria.^[7]
2. Hyperglycemia: Diabetes (fasting plasma glucose ≥ 126 and/or 2-h post-meal glucose $\geq 200 \text{ mg}/\text{dL}$) or pre-diabetes [Impaired fasting glucose (IFG): Fasting plasma glucose $\geq 100 < 126$]—American Diabetes Association (ADA) criteria.^[8]
3. High BP: Hypertension (systolic BP ≥ 140 and/or diastolic BP $\geq 90 \text{ mmHg}$)—Joint National Committee (JNC)-7 criteria^[9] or borderline high BP (systolic BP $\geq 130 < 140 \text{ mmHg}$ and/or diastolic BP $\geq 85 < 90 \text{ mmHg}$)—International Diabetes Federation (IDF) criteria.^[10]
4. Hypertriglyceridemia (triglycerides $\geq 150 \text{ mg}/\text{dL}$)—IDF criteria^[10]
5. High LDL-cholesterol ($\geq 130 \text{ mg}/\text{dL}$)—National Cholesterol Education Program (NCEP) criteria^[11]
6. Low HDL-cholesterol $< 40 \text{ mg}/\text{dL}$ in men or $< 50 \text{ mg}/\text{dL}$ in women—IDF criteria.^[10,11]

We also assessed prevalence of underweight ($\text{BMI} < 18.5 \text{ kg}/\text{m}^2$)^[7] and anemia (hemoglobin $< 13 \text{ g}/\text{L}$ in men and $< 12 \text{ g}/\text{L}$ in women) using WHO criteria.^[12]

“Risk factor clustering” was defined as the presence of ≥ 2 risk factors from the 6 cardiometabolic risk factors. We assessed the distribution of risk factor clustering across categories of age and gender. Statistical Package for Social Sciences for windows (SPSS, Chicago III) (SPSS-Inc., Chicago, IL), version 16 was used for analysis.

RESULTS

Of 5,800 employees in two IT industries, 1,350 (23%) (78% men) participated voluntarily in the annual health checks offered by the employers. The mean age of the employees was 33 ± 6 years; the majority (72%) were between 30 and 40 years of age. Mean weight of the employees was $70.3 \pm 11.7 \text{ kg}$ and

mean height was $167.1 \pm 8 \text{ cm}$. Twenty (1.5%) employees were underweight, 573 (42.4%) were overweight, and 121 (9%) were obese. The proportions were similar in both genders (P for difference = 0.33).

Data on blood tests revealed that one in two (50%) employees were anemic; the prevalence of anemia was greater in women compared to men (71.2% vs 30.4% $P < 0.001$). Of the total employees, 20 were known to have diabetes and 135 were known to have hypertension. Eleven were newly diagnosed with diabetes and 49 were newly diagnosed with hypertension during the checks. Thus, a total of 31 (2.5%) employees had diabetes and 184 (13.5%) had hypertension. Eleven (~1%) employees suffered from both these conditions. Prevalence of prediabetes (IFG) and borderline-high BP were 6.5% and 20.3%, respectively. Hypertriglyceridemia was seen in 21.0% and a similar proportion (22.1%) of employees had high LDL-cholesterol levels. Low HDL-cholesterol was common amongst these employees (70.1%) (Figure 1: Prevalence of cardiometabolic risk factors).

Only 6.8% employees did not have any risk factors while one-third (29.7%) had one risk factor. The remaining 63.5% employees had clustering of risk factors (≥ 2 risk factors). Of them, 27.2%, 26.3%, 8.9%, and 1.1% employees had two, three, four, and five risk factors, respectively. (Figure 2: Distribution of risk factor clustering).

Prevalence of risk factor clustering increased with age (P for trend < 0.001) but was similar in both genders (63.0% in men vs 65.1% in women, P for difference = 0.5).

DISCUSSION

Our study reveals a high prevalence of cardiometabolic risk factors amongst IT employees at a relatively young age in India; 9% had prediabetes or diabetes and 33.8% had borderline high BP or hypertension. Only 6.8% employees had no risk factors while 63.5% had clustering of risk factors. The distribution of disease and risk factors resembles an iceberg [Figure 1] where diseases correspond to the tip (visible portion) and risk factors to the base (vast invisible portion). The base (risk factors) remains unnoticed and often undiagnosed due to lack of any obvious signs and symptoms. Less than a quarter (23.3%) of the employees participated in the free annual health checks offered by employers suggesting that there is considerable lack of awareness and negligence about health in these young professionals. Moreover, one-third of those who had diabetes or hypertension were unaware of the condition. Our findings underline the importance of raising awareness, conducting regular health screenings and designing interventions to reduce the burden of risk factors before cardiometabolic diseases appear.

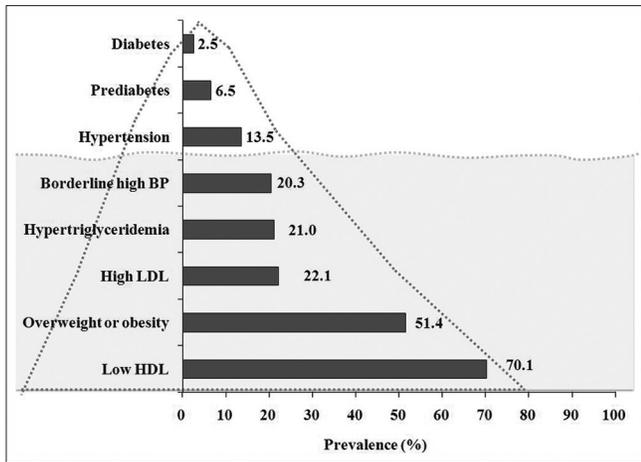


Figure 1: Prevalence of cardiometabolic risk factors

When compared with the only study available on an Indian industrial population,^[6] it was evident that the prevalence of diabetes and hypertension was more than double (40.1 vs 2.5% and 27.7 vs 13.5%, respectively) in that study. These differences may possibly be due to the older age of those participants compared to our study population (mean age 40 ± 6 years vs 33 ± 6 years). The study population in the previous survey was heterogeneous as both employees and their family members were included. It is interesting to note that despite these differences the prevalence of overweight and obesity was similar (51%) in our study participants. It is possible that these employees are at greater risk due to a higher BMI at a younger age.

Though our survey is an opportunistic analysis and information on parameters such as education, socioeconomic status, family history, abdominal obesity (waist circumference), and lifestyle factors such as dietary intake and physical activity is not available, the group we studied is relatively homogenous. The employees of IT industry are qualified professionals who are well paid and exposed to a similar work environment. We obtained records anonymously and ensured the data available from the two industries were comparable.

To our knowledge, this is the first study to establish the prevalence of cardiometabolic risk factors in employees of IT industry in India. The high burden of risk factors at a relatively young age is suggestive of an urgent need to spread awareness among IT employees and encourage them to take up health checks offered through workplaces. Workplace intervention programs to promote healthy lifestyle have proven to be effective.^[43] A technology-based intervention (use of internet or mobile phone technologies) may form an alternative strategy and a cost-effective option to labor-intensive interventions attempted previously. It may also be an acceptable approach considering the technology literacy of these employees. Based on these factors, we are delivering a technology-based lifestyle modification intervention in IT employees to test its

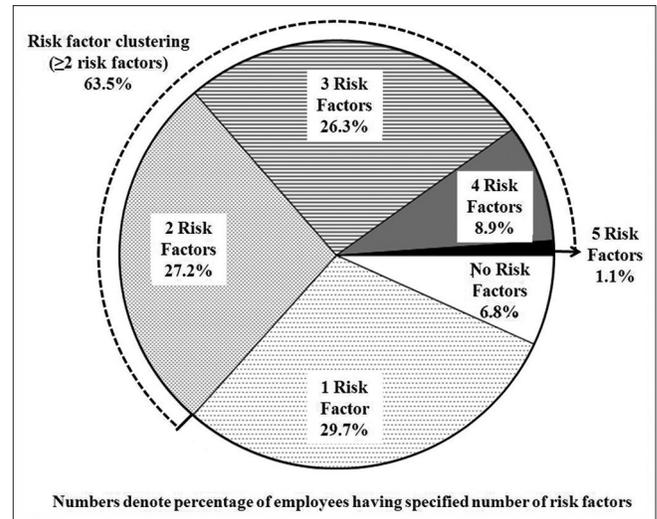


Figure 2: Distribution of risk factor clustering

acceptability and effectiveness. Such programs may improve the health profile of the workforce, and in the longer term improve work productivity and benefit both employees and employers.

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Conflicts of interest

There are no conflicts of interest.

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