



High Prevalence of Cardiometabolic Risk Factors among Young Physicians in India

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Abstract

Aim : To assess the health status of young Indian doctors engaged in clinical practice compared with the general population.

Materials and Methods : During a continuing medical education programme on diabetes, data from 2499 doctors from urban and semiurban areas, (mean age 39.0 ± 9.0 yrs), were collected and was compared with 3278 subjects from general population (mean age 37.0 ± 8.0 yrs). Prevalence of diabetes, hypertension, obesity, dyslipidaemia, metabolic syndrome, smoking and alcohol consumption were analysed.

Results: Doctors had significantly higher ($p < 0.001$) prevalence of all abnormalities except diabetes, compared with the general population (diabetes 13.3 Vs 14.8%, impaired glucose tolerance 10.7 Vs 7.4%, hypertension 35.6% Vs 27.0%, obesity 55.5% Vs 35.8%, metabolic syndrome 29.0% Vs 24.8%). Undetected cases of diabetes and hypertension were similar in both groups. Use of alcohol was more common among doctors. Other illness was less common among doctors (13.2% Vs 21.8%, $p < 0.001$).

Conclusions: In India, doctors had high prevalence of metabolic disorders showing that they had not taken good care of their health. Doctors need to be motivated to practise good healthcare habits that they advocate to their clients. ©

INTRODUCTION

Practising physicians involved in clinical care are an important segment of public health care. They have good access to information on disease frequency and determinants. Therefore, knowledge and awareness regarding the health consequences of lifestyle changes are generally expected to be high among clinicians. This in turn could influence the prevalence of lifestyle diseases such as diabetes and hypertension among them. There is paucity of data on the lifestyle-associated disorders among physicians. There is some data from Australia,¹⁻³ New Zealand,⁴ United Kingdom⁵ and United States of America.^{6,7} There is sparse data from developing countries.^{8,9} Hence this study was done to assess the health status of doctors from urban and semiurban areas in India.

In urban and semiurban India, prevalence of metabolic disorders like diabetes and dyslipidaemia is high and continue to increase.¹⁰⁻¹² Awareness on healthy habits, need for early detection and treatment of diseases are low in the general population and is largely dependent on the level of education.¹³

We assessed the health profile of a large group of young doctors and specifically looked for prevalence of diabetes, impaired glucose tolerance and other cardiometabolic risk factors. A comparison of the profile in the general population with similar demographic characteristics was done.

SUBJECTS AND METHODS

The study was done in 2499 practising physicians (Men : Women, 1878 : 621) aged 25 to 55 years (mean 39.0 ± 9.0 years) representative of physician from urban and semiurban areas who participated in a continuing medical education programme conducted by us between 2004 to 2006. They had a minimum of 5 years clinical experience; 52% were practising in rural areas and remaining in towns of seven states of India (Tamilnadu, Kerala, Karnataka, Andhra Pradesh, Gujarat, Orissa and New Delhi) spreading in all regions of the country. The control population was 3278 subjects (men : women 1367 : 1911) of similar age group and socioeconomic status (mean 37.0 ± 8.0 years) chosen from the population screened for diabetes in a city and town in Tamilnadu in 2006. The screening procedures were similar in both study groups. Demography, medical history, smoking and alcohol habits, family history of diabetes and / family history of cardiovascular diseases were recorded. Standard oral glucose tolerance test (WHO)¹⁴ was done for non diabetic subjects. Fasting and 2h post prandial blood

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glucose was done for known cases of diabetes. History of hypertension and treatment details were noted. Average of two blood pressure readings in sitting position was recorded. Values $\geq 130/\geq 85$ mmHg was considered to be abnormal.¹⁵ Fasting serum total cholesterol, triglycerides (TG) and high density lipoprotein – cholesterol (HDL) were estimated in low density lipoprotein – cholesterol (LDL) was calculated using Friedwald's formula and very low density lipoprotein – cholesterol (VLDL) was also calculated (TG/5).

Height and weight were measured, body mass index (BMI, kg/m²) was calculated. Waist circumference was measured as the minimum girth between the iliac crest and lower costal margin. BMI ≥ 25 kg/m² and waist circumference ≥ 90 cms for men and ≥ 85 cms for women were considered abnormal.¹¹ Cut off values for lipids were : cholesterol ≥ 200 mg/dl, TG ≥ 150 mg/dl, HDL <40 mg/dl for men and <50 mg/dl for women.

Diagnosis of diabetes was made if the fasting plasma glucose was ≥ 126 mg/dl and/or 2 hr post glucose plasma glucose was ≥ 200 mg/dl.¹¹ Impaired glucose tolerance (IGT) was diagnosed if the 2 hr plasma glucose was between 140–199mg/dl with a fasting plasma glucose of < 126 mg/dl (WHO).¹⁴

Diagnosis of metabolic syndrome was made using the ATP III criteria modified to suit Indian population.¹¹ Metabolic syndrome was diagnosed if any three or more of the following were present : hyperglycaemia, (fasting glucose ≥ 110 mg/dl or diabetes), hypertension, waist circumference > 90 cms for men and ≥ 85 cms for women,

Table 1 : Characteristics of study groups

	Doctors	General Population
Total number (N) (Men : Women)	2499 (1878 : 621)	3278 (1367 : 1911)
Family history (Positive) n (%)		
Diabetes	1369 (54.8)*	1313 (40.1)
CVD	737 (29.5)*	60 (1.8)
	Values - mean \pm SD	
Age (years)	39.0 \pm 9.0**	37.0 \pm 8.0
BMI (kg/m ²)		
Men	25.6 \pm 4.0**	23.7 \pm 4.1
Women	27.1 \pm 5.0**	25.0 \pm 4.9
Waist circumference (cm)		
Men	90 \pm 9**	85 \pm 11
Women	85 \pm 10**	83 \pm 11
BP (mmHg)		
Systolic	120 \pm 15	120 \pm 12
Diastolic	79 \pm 20**	77 \pm 8
Lipids (values in mg/dl)		
Cholesterol	186 \pm 35**	172 \pm 37
TG	148 \pm 126**	140 \pm 88
HDL		
Men	44 \pm 9**	42 \pm 10
Women	44 \pm 22*	46 \pm 7
LDL	112 \pm 31**	101 \pm 32
VLDL	28 \pm 16	27 \pm 15

* Chi-square test – p < 0.001 Vs general population

** 't' test - p < 0.001 Vs General Population

TG ≥ 150 mg/dl, HDL < 40 mg/dl for men and < 50 mg/dl for women.

Plasma glucose was estimated by glucose – oxidase peroxidase method and lipids by standard enzymatic method using Hitachi 902 autoanalyser. Reagents of Roche diagnostics (Germany) were used.

Statistical Analyses

Mean and SD of variables are shown. Unpaired 't' test, 'Z' test or Chi square test was used for inter group comparisons. Prevalence of diabetes, IGT and hypertension were age-standardized by direct standardization method using the census data of 2001 for Tamilnadu urban area and 95% confidence intervals were calculated. P value < 0.05 was considered significant.

RESULTS

Table 1 shows the characteristics of the doctors and the general population. Family history of diabetes and cardiovascular diseases were significantly higher among doctors. Doctors had higher mean BMI and upper body adiposity and higher mean diastolic blood pressure. Total cholesterol and LDL values were higher, but they had better mean HDL values.

Table 2 shows the age-adjusted prevalence of diabetes, IGT and hypertension. Prevalence of diabetes was similar in both groups, but IGT was more prevalent among the doctors. Among the doctors 68.4% and among the general populations 60.0% of diabetic cases were known cases. Doctors had a significantly higher prevalence of hypertension and 71% were newly diagnosed cases. Among the general population, 72% of hypertensives were newly diagnosed. Overweight and upper body adiposity indicated by high waist circumference were more among the doctors.

Table 2 : Prevalence of abnormalities in percentages

Abnormality	Doctors n = 2499		General population n = 3278		p-value*
	n	%	n	%	
Diabetes**	324	13.3 ^a	417	14.8 ^b	0.114
IGT**	290	10.7	243	7.4	<0.001
Hypertension**	1006	35.6 ^c	881	27.0 ^d	<0.001
BMI (≥ 25 Kg/m ²)					
Men	1042	55.5	489	35.8	<0.001
Women	406	65.4	935	48.9	
Waist					
Men (≥ 90 cms)	915	48.7	425	31.1	<0.001
Women (≥ 85 cms)	308	49.6	786	41.1	<0.001
Cholesterol	788	31.5	696	21.2	<0.001
> 200 mg/dl					
TG (> 150mg/dl)	835	33.4	1017	31.0	<0.001
HDL					
Men (<40mg/dl)	600	31.9	610	44.6	<0.001
Women (<50mg/dl)	363	58.5	1283	67.1	<0.001
LDL (≥ 100 mg/dl)	1565	62.6	1533	46.8	<0.001
VLDL (≥ 30 mg/dl)	827	33.1	1000	30.5	<0.001

* Chi-square test; ** Prevalences are age –standardized

Known cases – a = 68.4%, b = 60.0%, c = 29%, d = 28%

Components of dyslipidaemia, except low HDL were more common among the doctors (Table 2).

Mean fasting and 2 hr plasma glucose in doctors with known diabetes were 145 ± 49 mg/dl and 218 ± 72 mg/dl respectively and the corresponding values were 160 ± 66 and 232 ± 104 mg/dl in the general population. The fasting value was significantly lower in ($p < 0.01$) among the doctors.

Prevalence of smoking (only in men) was similar in both groups (10.7% in doctors and 10.3% in general population, $p = 0.64$), but use of alcohol was more common among the doctors (16.4% vs 9.0%, $Z = 8.5$, $p < 0.001$).

Illness, such as cardiovascular, respiratory or arthritis were more prevalent in the general population (21.8% vs 13.2, $Z = 8.38$, $p < 0.001$). History of heart diseases was present in 34 (1.36%) of doctors and in 40 (1.22%) of the general population.

Metabolic syndrome was more common among doctors (29.0% vs 24.8, $Z = 3.55$, $p < 0.001$), the proportion was higher in male doctors (30.2% vs 25.3%, $Z = 2.3$, $p < 0.001$) while in the general population, it was more among females (36.2% vs 22.9%, $Z = 2.1$, $p < 0.001$) (Fig. 1).

DISCUSSION

Illness among doctors include all the expected categories for the general population at large such as cardiovascular diseases, respiratory disorders, musculoskeletal disorders, cancer and psychiatric illness.¹⁻³

Although awareness of lifestyle diseases was high among doctors, the study showed that young Indian physicians had significantly higher prevalence of hypertension, impaired glucose tolerance, abdominal adiposity and dyslipidemia.

The prevalence of diabetes among doctors was similar to that in the general population. In 32% of them the diagnosis was opportunistic, as was in 40% of the general population. Presence of 32% of undiagnosed diabetes and 71% of undiagnosed hypertension, which were similar to that in the general population indicated that doctors also did not have regular medical check up. Positive family history of diabetes and of cardiovascular disease was present in a large percentage of doctors and it had not prompted them to have periodic check up for the disorders. Higher rates of family history of metabolic disorders among the doctors

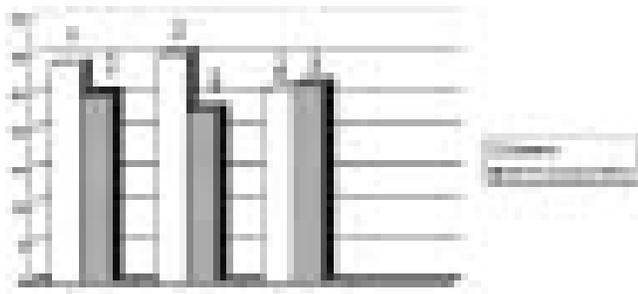


Fig. 1 : Prevalence of metabolic syndrome among the doctors and the general population are shown: Prevalence was higher in doctors ($P < 0.001$), especially among men.

could partly be due to better awareness of these diseases. High prevalence of obesity, diabetes, hypertension and dyslipidaemia had been reported in another study of a smaller group of physicians in northern India.⁸ Our study group of doctors were from southern and northern parts of the country.

Prevalence of metabolic syndrome was significantly higher among the doctors and male preponderance was seen in its occurrence, contrary to a female preponderance generally seen in the Indian population.¹¹

Most studies from developed countries also show that doctors, generally do not take good care of their health.^{1,4,5} Our findings are in agreement with this. This was supported by the observation of high blood glucose values even among the known diabetic doctors. Contrary to the above findings, studies by Frank and co workers in United States of America had observed that physicians have very good health habits compared with the general population.⁷ It was also demonstrated that a physician explaining one's own healthy practices could more effective in motivating the patients to follow similar practices.⁶

A study in medical students of Karachi, Pakistan, showed general neglect of their health and highlighted the urgent need to promote preventive knowledge and practice among them.⁹

Results of our study show that young Indian physicians have high rates of cardiometabolic risk factors and therefore do need more motivation to follow good health care practices which they advocate to their clients.

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Announcement

JAPI Awards

Following papers were selected for "Dr. JC Patel and BC Mehta Best Paper Awards" for the articles published in the Journal for the year 2006 – 2007

Best Original article entitled "Dietary Salt Intake and Hypertension in an Urban South Indian Population (CURES-53), - G Radhika, RM Sathya, V. Sudha, A Ganesan, V Mohan, Madras Diabetes Research Foundation & Dr. Mohan's Diabetes Specialities Centre, Chennai.. *J Assoc Physicians India* 2007;55(06): 405 – 411.

Joint 2nd Prize for 2nd Best Original article entitled "Accuracy of Filter Paper Method for Measuring Glycated Hemoglobin" – Anjali, FS Geethanjali, R Selva Kumar, MS Seshadri, Departments of Endocrinology and Clinical Biochemistry, Christian Medical College, Vellore, Tamil Nadu. *J Assoc Physicians India* 2007;55(2): 115-119.

Joint 2nd Prize for 2nd Best Original article entitled "Utility of Scorpion Antivenin Vs Prazosin in the Management of Severe Mesobuthus Tamulus (IRS) Envenoming at Rural Setting" HS Bawaskar, PH Bawaskar Bawaskar Hospital, Mahad, Dist. Raigad, Maharashtra. *J Assoc Physicians India* 2007; 55 (01): 14-21..

1st Prize for Best Case Report entitled "Coeliac Sprue – New Frontiers in Diagnosis and Role of Capsule Endoscopy"- NH Banka, P Dhavan, BP Chevale, Bombay Hospital and Institute of Medical Sciences, Mumbai. *J Assoc Physicians India* 2006; 54 (12):959-961.

Joint 2nd Prize for 2nd Best Case Report entitled "Acute Reversible Hearing Loss in Scrub Typhus" – SK Mahajan, D Bakshi, Deen Dayal Upadhyaya Hospital, Gwalior, MP *J Assoc Physicians India* 2007;55: (07) 512-514

Joint 2nd Prize for 2nd Best Case Report entitled "Refractory Hyperkalaemia Due to Trimethoprim, Successfully Treated with Fludrocortisone" - S. Sanjay, RA Annigeri, R Gopalakrishnan, Apollo Hospitals, Chennai S. Sanjay, RA Annigeri, R Gopalakrishnan, Apollo Hospitals, Chennai. *J Assoc Physicians India* 2007; 55: (01) 74-77.

1st Prize for Best Correspondence entitled "Clinical and Biochemical Heterogeneity of "Early Onset" Type 2 Diabetes Mellitus "- TS Ashida, AK Das, MG Sridhar, Jawaharlal Institute of PGIMER, Pondicherry. *J Assoc Physicians India* 2006; 55: (03) 245-246.

2nd Prize for Best Correspondence entitled "Call for Spontaneous Reports of Adverse Drug Events from Indian Physicians – Need of the Hour" – NJ Gogtay, NA Kshirsagar, - South West Zonal Centre for ADR Reporting, Department of Clinical Pharmacology, Seth GS Medical College and KEM Hospital, Mumbai 400 012. *J Assoc Physicians India* 2007; 55 (08): 597-598.

Shashank R Joshi
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