An Observational Study of Cardiometabolic Status of Health Professionals Working At Tertiary Care Centre in Ranchi, Jharkhand.

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ABSTRACT

Background: Cardiometabolic disorders is a combination of medical disorder that when occurring together increases the risk of cardiovascular disease and diabetes, the leading causes of morbidity and mortality worldwide. The incidence of cardiometabolic diseases is increasing at a fast pace in general population as well as in health professionals. These disorders or diseases might forces many health professionals to quit their profession prematurely. The situation is alarming and considerable. Since health care workers are one decisive factor in any health strategies employed they should also set an example by taking care of their own health. Hence the aim of our study was to determine prevalence of cardiometabolic risk factors among health professionals, so that they can be motivated to adopt healthier life style to increase their professional life as well as health care. **Methods:** A cross sectional study was performed including 100 subjects aged between 25-64 years, selected from various departments of Rajendra Institute of Medical Sciences, Ranchi, after taking consent an interview was taken based on questionnaires followed by physical and biochemical measurements including BMI, blood pressure, waist circumference, lipid profile and fasting blood glucose. Subjects were diagnosed as cases of metabolic syndrome based on the modified NCEP ATP III (MS-4) diagnostic criteria. **Results:** It was observed that prevalence of different cardiometabolic risk factors was metabolic syndrome 43%, impaired glucose tolerance 17%, obesity 30%, hypertension 17%, sedentary life style 66%, positive family history of hypertension or diabetes 72% and addiction of tobacco 1%, alcohol 30% or smoking 29%. Self reported occupational stress was present in 59% of subjects. **Conclusion:** It was observed that study subjects had high frequency of cardiometabolic risk factors including smoking, alcohol consumption, sedentary life, family history of Hypertension and Diabetes, overweight or obesity, hypertension, dyslipidaemia, hyperuricemia and metabolic syndrome.

Keywords: Cardiometabolic risk factors, Hypertension, Diabetes, Dyslipidaemia, Metabolic syndrome.

INTRODUCTION

Health care providers are the backbone of any health delivery system. They are providing the best health care to patients round the clock. They have a good access to information on every aspect of diseases. In addition, health professionals are very much familiar with the health consequences of life style changes. This in turn could influence the prevalence of life style diseases such as diabetes and hypertension among them.[1]

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The medical profession has a long tradition of denying their own health issue and "soldering on" even when they are unwell. Health care providers around the world are subject to pressures resulting from a sharp escalation of change, growing economic pressures, technological advances, increasing patient expectations, rationing of health care, and the requirement for more evidence-based and high quality health care, improved performance, and productivity, are many of the reason to make their life stressful and expose them to personal health problems.[2] It is well documented that physicians are unable to look after their own health despite being aware of adverse health outcome in patients with increased cardio metabolic risk factors.[3] While lack of time, sedentary lifestyle and higher socio-economic status could explain the propensity for increased risk, many physicians could lack adequate health care.[4] In a study of 90 physicians 35% had

no regular access to health care and preventive services.[5]

Study shows that prevalence of metabolic disorders like diabetes, hypertension, dyslipidaemia and metabolic syndrome is high and continues to increase in medical professional as well as general population and in medical professional it is due to their negligence about their health.[6-7] One study found that 44% of doctors have chronic health problems[8] and another reported that half of a group of 408 GPs in the United Kingdom had a serious illness or an operation as an adult.[9] Illnesses among doctors include all the expected categories for the general population at large: cardiovascular problems (4%-15%), respiratory illness (10%-21%), musculoskeletal problems (9%-38%), cancer (2%-3%) and psychiatric illness (3%-10%).[10] Suicide rate in health professionals is also significant in comparison to general population. These disorders or diseases might forces many health professionals to quit their profession prematurely.[11]

Only few studies had been done all over India in this regard, no similar study has been done in Jharkhand state. Hence this study was done to gather some information regarding cardiometabolic disorders among health professionals, so that they can be motivated to adopt healthier life style to increase their professional life as well as health care.

MATERIALS AND METHODS

Approval from the Institutional Ethical committee was taken. The cross sectional study was conducted among the 100 physicians in a tertiary care hospital RIMS, Ranchi. The study subjects with age group 25-64 years were selected from various departments like department of Medicine, Surgery, Orthopaedics, Obstetrics and Gynaecology, Dermatology, Paediatrics, Radiology, Anaesthesia, Cardiology, Eye, ENT etc

Inclusion Criteria:
Inclusion criteria were willingness to participate in the study, age between 25-64 years and a state of fasting for at least 10 hours.
Exclusion Criteria:
Exclusion criteria included the patients suffering from any serious illness.

A lifestyle questionnaire including demography, medical history, smoking, alcohol habits, stress, family history of diabetes and / family history of cardiovascular diseases and physical activity sedentary; irregular physical activity (less than 30 minutes a day 3 times/week); and regular physical activity (30 minutes or more a day 3 times/week)[12] was filled up. Anthropometric measurements including weight (in bare feet without heavy clothing with standard weighing scale), height (in bare feet without headwear measured using a measure tape against wall), waist circumference in cm (at the narrowest point between the lower costal border and the iliac crest), hip circumference in cm (at the greatest circumference of the buttocks measured) were done. Blood pressure (at the midpoint of the arm with standard sphygmomanometer) was measured. Average of two blood pressure readings in sitting position was recorded. BMI was calculated as weight in kilograms divided by height in meters squared.

The baseline examination included fasting blood samples for glucose, lipid profile and uric acid. Biochemical tests were analyzed in an automated analyzer (Beckman Coulter AU480). All the samples were kept at 2-8 degree C and either analyzed same day or kept at -20 degree C to be analyzed within next two days.

Metabolic syndrome was diagnosed as per the criteria of modified NCEP ATP III (MS-4) criteria.[13] Metabolic syndrome was considered to be present if three or more of the following definition criteria were present [Table 1].

Table 1: Modified NCEP ATP III (MS-4) Criteria

Sr. No.	Risk factor	Cut off value
1	Blood pressure (mm of Hg)	≥130/85 mm of Hg
2	Triglycerides	>150 mg/dl
3	High-density lipoprotein cholesterol	<40 mg/dl for men
		<50 mg/dl for women
4	Abdominal obesity: Waist circumference (cm)	>90 cm for men
		>80 cm for women
5	Body Mass Index (kg/m^2)	≥ 23 kg/m^2
6	Fasting plasma glucose (mg/dl)	>100 mg/dl

The collected data were summarized, tabulated & analyzed. The data was entered in Microsoft excel 2007 to know the frequency of the various lifestyle patterns. Yates Chi square tests were used to compare proportions. $P < 0.05$ was considered to be statistically significant.

RESULTS

Socio-demographic criteria and cardiometabolic risk factors of the studied physician:
A total of 100 subjects participated in the present study. This included 90.0% males and 10.0% females. Majority of subject (83.0%) belonged to 25-34 years age group. The majority of study population (72.0%) had positive family history of hypertension, diabetes and obesity in the family. 28.0% of the subjects had no family history of any diseases. In the food-habit group, 83.0% subjects were non-vegetarian and 17.0% subjects were vegetarian. In the addiction group, 40.0% subjects didn't have any addiction, 30.0% subjects were addicted to Alcoholism, 29.0% subjects were addicted to Smoking, and 1.0% subjects were addicted to Chewing tobacco. 66.0% subjects had sedentary life style and 34.0% subjects had active life style.

Self reported occupational stress was found in 59% of subjects while 41% had no stress. Chronic illness such as arthritis, respiratory cardiovascular was reported by 16% of the subjects. 9% of the subjects had a history of admission to hospital due to serious illness or surgical problems in the last one year [Table 2].

Physical & biochemical measurements among the studied physician:

The prevalence of obesity in the study population was 30.0 %. Prevalence of overweight was 35%. Increased waist circumference was present in 17% of subjects. 17.0% subjects were hypertensive (BP > 130/>85 mmHg. Most of the study population (83.0%) had normal Fasting Plasma Glucose. 17.0% subjects had Impaired Glucose Tolerance (Fasting Plasma Glucose<100 mg/dl). 56.0% subjects had hypertriglyceridemia (serum triglyceride level more than 150 mg/dl). 52.0% subjects had low serum HDL level. Prevalence of hypercholesterolemia (total Cholesterol level $\geq$ 200 mg/dl) was 59.0% and prevalence of LDL level $\geq$ 100 mg/dl was 55.0%. 26% subjects had high serum uric acid level [Table 3].

Frequency of metabolic syndrome among the studied participants:

Overall frequency of metabolic syndrome according to modified NCEP ATP III (MS-4) criteria was 43.0% among the studied subjects. The proportion was higher in male doctors.

Table 2: Core demographic and core behavioural measures.

Sr. No.	Variable		Number of Subjects (%)
1)	Age Groups (Years)	25-34	83
		35-44	06
		45-54	05
		55-64	06
2)	Sex	Male	90
		Female	10
3)	Sedentary life		66
4)	Alcohol consumption		30
5)	Smoking		29
6)	F/H of diabetes (DM)		28
7)	F/H of hypertension (HTN)		41
8)	F/H of Cardio Vascular Diseases		12
9)	Stress factor		59
10)	Illness (arthritis, respiratory or cardiovascular)		16

Table 3: Frequency distribution of physical & biochemical measurements among the subjects

RISK FACTORS			NO.OF SUBJECTS		DEGREE OF FREEDOM	YATE'S CHI SQUARE	YATE'S P-VALUE
			MALE	FEMALE			
1)	Blood pressure (mm of hg)	HIGH ($\geq$130/85)	16	1	1	0.031	0.8
		NORMAL	74	9			
2)	BMI (kg/m^2)	$\geq$25 kg/m^2	28	2	1	0.132	0.7
		$\leq$25 kg/m^2	62	8			
3)	Fasting plasma glucose	>100 mg/dl	15	2	1	0.031	0.8
		<100 mg/dl	75	8			
4)	Serum triglyceride	$\geq$150 mg/dl	54	2	1	4.334	0.03
		<150 mg/dl	36	8			
5)	HDL	Low	43 (< 40 mg/dl)	9 (< 50 mg/dl)	1	4.84	0.02
		Normal	47 (> 40 mg/dl)	1 (> 50 mg/dl)			
6)	Total cholesterol	$\geq$ 200 mg/dl	57	2	1	5.31	0.02
		<200 mg/dl	33	8			
7)	LDL	> 100 mg/dl	52	3	1	1.79	0.18
		< 100 mg/dl	38	7			
8)	Uric acid	>7.2 mg/dl	23	3	1	0.06	0.93
		<7.2 mg/dl	67	7			
9)	Metabolic syndrome	Present	40	3	1	0.29	0.59
		Absent	50	7			

DISCUSSION

Only few studies had been done on the cardiometabolic risk factors in the health professionals in India. The present work is being done to asses cardiometabolic risk factors in physician community from the state of Jharkhand.

We noted a high prevalence of cardiometabolic risk factors, including personal habits, sedentary life, family history of (HTN, and type 2 DM), overweight or obesity, central obesity, hypertension, type 2 diabetes mellitus, dyslipidaemia, and metabolic syndrome.

Aside from its significant impact on patients' health, tobacco usage also represents an important occupational health issue in the medical profession. Despite this fact, however, doctors in many regions including this study are known to smoke tobacco at rates similar to or even exceeding those seen within the general population.[14] The present study revealed higher prevalence (29.0%) of current smokers among physicians compared to that presented in China (16%) among physicians.[15] Moreover, smoking is an established risk factor for development of cardiometabolic disease. Programs are warranted in this population for prevention.

Alcohol users in present study were 30.0% among study subjects. Similarly, alcohol users among doctors in previous studies in India were 16.4% and 17% respectively.[1,11]. Furthermore, Excessive alcohol consumption is associated with left ventricular dysfunction, dilated cardiomyopathy, and hypertension as demonstrated in previous study.[16]

Our study shows a glaring prevalence of sedentary lifestyle (66%) among physicians that might place them at high risk of cardiometabolic diseases later on and all cause mortality. Our findings were higher than found in previous studies among physicians in India, which were 20% & 15% respectively.[3,11] The present findings could be explained by lack of sufficient time to perform physical activity especially among physicians in addition to the improvement in their socioeconomic status with multiple fast food availability & obesity, all moves towards more sedentary lifestyle.

Despite the fact that physicians are healthier and have better health habits than general population, our findings are surprising, as the current study revealed high frequency of overweight (BMI>25kg/m²), and obesity (BMI>30kg/m²), 35% and 30.0% respectively, which is also consistent with other findings from previous studies in Cameroon.[17] The high proportions of overweight and obesity among study subjects might be attributed to high consumption of fast food owing to lacking of time, sedentary life and cultural standards.

Self reported occupational stress was found in 59% of doctors while 41% had no stress, consistent with findings from previous study in California.[18] In addition, high stress level especially increases the activation of hypothalamic-pituitary-adrenal axis resulting in cortisol secretion which leads to deposition of fat in certain areas like abdomen, buttocks which predisposes to central obesity.[19]

The current study showed that 17.0% subjects had hypertension. Findings are consistent with previous study in Saudi Arabia which reported increased risk of hypertension among physicians.[20] This high prevalence of hypertension among physicians may be attributable to changes in dietary habits especially fast & salty foods, sedentary lifestyle, high job stresses and rates of obesity.

Our study shows that 17.0% of the subjects had high fasting plasma glucose level. Different studies have confirmed that the period of time prior to the development of diabetes, when patients have impaired glucose tolerance (prediabetes), may also predispose them to increased cardiovascular risk.[21]

Study subjects in current study had higher percentage of high total cholesterol level, high triglyceride level, low HDL-C, and high LDL-C (59.0%, 56.0%, 52.0%, and 55.0% respectively. Different studies have confirmed south Asians have a high rate of coronary artery disease (CAD) and this is highly correlated with hypertriglyceridemia and lower levels of HDL cholesterols.[22] Higher prevalence of dyslipidaemia among study subjects in our study might be attributed to high prevalence of sedentary life, overweight and obesity & lack of care in healthy food preparation at home.

In the present study, 26% of the subjects had hyperuricemia. Recent studies show that high uric acid level is associated with some cardiometabolic risk factors in prediabetic individuals compared with normal person. UA level is also a significant predictor for prediabetic condition.[23]

We observed an overall frequency of metabolic syndrome according to modified NCEP ATP III (MS-4) criteria was 43.0% among the studied subjects. Other studies showed similar high prevalence of metabolic syndrome in Indian physicians.[6] This could be due to predominance of specific indicators of metabolic syndrome such as high fasting plasma glucose, overweight, obesity and dyslipidaemia.

Results of our study show that subjects had high frequency of cardiometabolic risk factors including smoking, alcohol consumption, sedentary life, family history of (Hypertension, Diabetes), overweight or obesity, stress, hypertension, dyslipidaemia, and metabolic syndrome.

CONCLUSION

This study provides first data on cardiometabolic risk factors among physicians in state of Jharkhand. Our study reveals alarming risk levels for cardiometabolic diseases in a physician population of Jharkhand state. This may be due to sedentary

life, personal habits, the stress factors due to the busy schedule and also due to pure negligence In spite of the medical knowledge about cardiovascular risk factors, the physicians lack of adopting a healthy lifestyle and their poor behavioral habits represent a challenge for medical community therefore do need more motivation to follow good health care practices which they advocate to their clients.

REFERENCES

1. Ramachandran A, Snehalatha C, Yamuna A, Murugesan N. High Prevalence of Cardio metabolic Risk Factors among Young Physicians in India. JAPI 2008;56:17-20.
2. Reem A Makames, Ebtisam M Alkoot, Bibi M Al-Mazidi, Medhat K El-Shazly. Sources and expressions of stress among physicians in a general hospital. Alexandria Journal of Medicine. Dec 2012; Vol 48 (4) : 361–366
3. Gandhi H, K. Vaishali V, Prem K, Vijayakumar P, Adikari B. 2012. A survey on physical activity and non-communicable disease risk factors among physicians in tertiary care hospitals, Mangalore. National Journal of Community Medicine. 3(1): 7-13.
4. Ghosh, A., S. Joshi. Physician's Health: Time to take Care (Editorial). J Assoc Physicians India. 2008;56:13-14.
5. Gross CP, Mead L A, Ford DE, Klag MJ. Physician, heal Thyself? Regular source of care and use of preventive health services among physicians. Arch Intern Med. 2000 Nov 27; 160(21): 3209–3214.
6. Mathavan A, Chockalingam A, Chockalingam S, Bilchik B, Saini V. Madurai Area Physicians Cardiovascular Health Evaluation Survey (MAPCHES) – an alarming status. The Canadian Journal of Cardiology. 2009;25(5):303-308.
7. Gupta A, Gupta R, Lal B, Singh AK, Kothari K. Prevalence of coronary risk factors among Indian Physicians. J Assoc Physicians India. 2001;49:1148-52.
8. Davidson S, Schattner P. Doctors' health-seeking behaviour: a questionnaire survey. Med J Aust .2003;179:302-305.
9. Chambers R. Health and lifestyle of general practitioners and teachers. Occup Med (Lond) 1992;42:69-78.
10. Kay MP, Mitchell GK, Del Mar CB. Doctors do not adequately look after their own physical health. Med J Aust. 2004;18:368-70.
11. Bansal, R., R. Katyal, S. Ahmed, R. Kumari, Self-reported health, illness and self-care among doctors of Meerut. Indian Journal of Community Health. 2012;24(1):23-26.
12. Wing, R. Exercise and weight control. In Handbook of Exercise in Diabetes. 2nd ed. Ruderman N, Devlin JT, Schneider SH, Kriska A, Eds. Alexandria, VA, American Diabetes Association. 2002;355-364.
13. Misra A, Wasir JS, Pandey RM. An evaluation of candidate definition of metabolic syndrome in adult Asian Indians. Diabetes Care. 2005; 28(2):398-403.
14. Smith DR, Zhao I, Wang L. Tobacco smoking among doctors in mainland China: a study from Shandong province and review of the literature. Tobacco Induced Diseases. 2012;10(1):14. doi:10.1186/1617-9625-10-14.
15. Smith DR, Wei N, Zhang YJ, Wang RS: Tobacco smoking habits among a cross-section of rural physicians in China. Aust J Rural Health. 2006;14:66-71.
16. Nakanishi, N., H. Yoshida, K. Nakamura, K. Suzuki, K. Tatara. Alcohol consumption and risk for hypertension in middle-aged Japanese men. J Hypertens. 2001;19:851-5.
17. Sobngwi, E., J. Mbanya, N. Unwin, T. Aspray, 2001. Alb ert K: Physical activity and its relationship with obesity, hypertension and diabetes in urban and rural Cameroon. Int J Obes Relat Metab Disord. 26:1009-16.
18. Bazargan M, Makar M, Bazargan-Hejaz et al. Preventive, lifestyle, and personal health behaviours among physicians. Acad Psychiatry. 2009 Jul-Aug; 33(4):289-95.
19. Mahajan, D., S. Birari, G. Khairnar, Y. Patil, V. Kadam, Y. Joshi. Prevalence of non-communicable disease risk factors in two groups of urban populations. Asian J Epidemiol. 2009;2:1-8.
20. Mona M Aboserea, Marwa M Zalat. Frequency of Cardiovascular Disease Risk Factors among Physicians at Jazan King Fahd Central Hospital (KFCH), Kingdom Saudi Arabia. Research Journal of Medicine and Medical Sciences. 2013;8(1):1-8.
21. Faeh D, William J, Yerly P, Paccaud F, Bovet P. Diabetes and pre-diabetes are associated with cardiovascular risk factors and carotid/femoral intima-media thickness independently of markers of insulin resistance and adiposity. Cardiovascular Diabetology. 2007; 6:32.
22. Enas EA, Chacko V, Pazhoor SG, Chennikkara H, Devarapalli HP. Dyslipidemia in South Asian patients. Curr Atheroscler Rep. 2007;9:367-74.
23. Iraj B, Feizi A, Abdar-Esfahani M, et al. Serum uric acid level and its association with cardiometabolic risk factors in prediabetic subjects. Journal of Research in Medical Sciences. 2014; 19(3):262-67.