

## HOW AWARE ARE THE EDUCATORS OF CARDIOVASCULAR RISK FACTORS?

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### ABSTRACT

**Objective:** The aim of this study was to know the frequency of CVD risk factors in teachers of Peshawar.

**Material and Methods:** Data for this study was derived from Peshawar Heart study (PHS). PHS was conducted by Cardiology Department Postgraduate Medical Institute, Lady Reading Hospital, Peshawar to determine various cardiovascular risk factors like diabetes hypertension, hypercholesterolemia, obesity, physical inactivity etc in various occupational groups of Peshawar.

**Results:** Data of 174 school teachers recruited in Peshawar Heart Study (PHS) was analyzed for the frequency of CVD risk factors. Their mean age was  $42.95 \pm 8.29$  years. Mean BMI was  $26.11 \pm 4.53$  Kg/m<sup>2</sup> and 35.05 % (n=61) were overweight and 47.07 % (n=83) were found to be obese. Mean systolic blood pressure was  $131.2 \pm 18.16$  mmHg and 33.33 % (n=58) had systolic blood of  $\geq 140$  mmHg. Mean diastolic blood pressure was  $89.25 \pm 12.13$  mmHg and 59.77 % (104) had their diastolic pressure  $\geq 90$  mmHg and 5.75% (n=10) were known hypertensive. Mean cholesterol was 168 mg/dl while 20.68 % (n=36) had cholesterol of  $\geq 180$ mg /dl. Out of 174 school teachers 4% (n=7) were known diabetic and 6.32 % (n=11) had RBS of  $\geq 140$  mg/dl. CAD was found in 3.44 % (n=6). Family history of CAD was positive in 18.96% (n=33). Fifty eight percent subjects admitted to regular exercise. ECGs were also analyzed and it was found that 2.88% (n=5) were having LVH, 1.75% (n=3) were having right bundle branch block (RBBB) and 2.88% (n=5) have changes of previous myocardial infarction.

**Conclusion:** It was demonstrated in this study that CVD risk factors especially lack of exercise, obesity and hypertension were common in school teachers.

### INTRODUCTION

At the beginning of the 20<sup>th</sup> century, cardiovascular disease (CVD) was responsible for fewer than 10% of all deaths world wide, today, that figure is about 30% with 80% of the burden now occurring in the developing countries.<sup>1</sup> In developing countries, CVD causes twice as many deaths as HIV, malaria, and tuberculosis.<sup>2</sup> Between 1990 and 2020, coronary heart

disease (CHD) alone is anticipated to increase by 120 % for women and 137% for men in developing countries, in comparison with age related increases of between 30% and 60% in developed countries.<sup>3</sup> Given the nearly \$400 billion in direct and indirect annual costs related to cardiovascular disease (CVD) in United States in 2006, the economic implication of this problem are equally important for sustainability of many developing countries.<sup>4</sup>

This is further compounded by the fact that such a high proportion of CVD burden occurs among adults of working age in developing countries. This can lead to large impact on a developing country's economic viability. The potential loss due to early CVD was evaluated in recent report A Race Against Time.<sup>5</sup> The

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Indian subcontinent (including India, Pakistan, Bangladesh, Sri Lanka, and Nepal) is home to 20 % of the world's population and may be one of the regions with highest burden of CVD in the world. The Indian subcontinent suffers from a tremendous loss of productive working years due to CVD.<sup>6</sup> CVD has been reported to be the leading cause of morbidity and mortality in the world including Pakistan. Life-style related risk factors are associated with increased risks of cardiovascular disease. Since individual's life-style can be changed, these factors are regarded as modifiable. Lack of exercise can be regarded as an example of life-style related risk factor for CVD there are many risk factors associated with CVD.<sup>7</sup>

The major risk factors, tobacco use, alcohol use, high blood pressure (hypertension), high cholesterol, obesity, physical inactivity, unhealthy diets, have a high prevalence across the world.<sup>8</sup>

Most Studies of the relation between work and socioeconomic groups and ischemic heart disease were performed in western populations and the relevance of these findings in Asian population is largely unknown.<sup>9,10</sup>

The aim of this study was to know the frequency of cardiovascular risk factors in Government school teacher of Peshawar and devise a strategy for prevention of CVD.

## MATERIAL AND METHODS

Data on school teacher recruited in Peshawar Heart Study was analyzed for frequency of cardiovascular disease (CVD) risk factors like diabetes (DM), hypertension, smoking, obesity, hypercholesterolemia, physical inactivity, family history CAD, etc.

Data on demographic, lifestyle, socioeconomic and health related variable were collected using questionnaire validated in Urdu-national language of Pakistan. Physicians at mobile examination centre performed a standard physical examination that included two blood pressure reading obtained in the sitting position, from right arm, 20 minute apart, using mercury sphygmomanometer. Trained technician performed anthropometric examination. Weight (wt) and height (ht) were recorded when a subject was in light clothes and with out shoes. Body

mass index (BMI) was calculated as wt in kilogram divided by height in meter square. Waist circumference was measured (to the nearest 0.1 cm) at the highest point of iliac crest, while hip circumference was measured over the maximal gluteal protuberance as viewed from lateral position. Waist to hip ratio (W/H) was calculated by dividing waist circumference to hip circumference. Non fasting blood chemistry including blood glucose and cholesterol were studied using the Reflotron multiphase biochemical analyzer. A 12 lead ECG was recorded of every subject.

## Variables definition

Hypertension was defined as a mean systolic blood pressure (BP) of  $\geq 140$  mmHg or diastolic BP  $\geq 90$  measured 20 minute apart, on 2 separate occasion or taking antihypertensive medication.<sup>11</sup> Diabetes was defined as random blood glucose of  $\geq 140$  mg/dl or those with known history of diabetes.<sup>12</sup> Hypercholesterolemia was defined as random blood cholesterol of  $\geq 180$ mg/dl or taking medications for elevated cholesterol.<sup>13</sup> Overweight was defined as subject having BMI of  $\geq 23$ kg/m<sup>2</sup> and  $\leq 26$ kg/m<sup>2</sup> while obesity was defined as subject was having BMI of  $\geq 27$ kg/m<sup>2</sup> or waist circumference of  $\geq 80$ cm for women and  $\geq 90$  cm for men.<sup>12,14</sup>

Exercise was defined by the following activity as walking or running etc for at least 20 minute at least 3 times a week.<sup>15</sup> Tobacco use was defined according to current use of cigarette or beddies or huqqa (tobacco in water or chewing tobacco or snuffing tobacco while ex smoker were define those who has quitted smoking one year back.<sup>16</sup> CVD was defined as if they had coronary artery disease (CAD) defined as self report of physician's diagnosis of angina pectoris or myocardial infarction (MI) silent myocardial infarction (defined as the presence of major Q waves by Minnesota criteria in the absence of as history of myocardial infarction), coronary artery bypass grafting (CABG) percutaneous coronary intervention or cerebrovascular accident (CVA) defined by history of stroke.<sup>17</sup>

## STATISTICAL ANALYSIS

For data analysis SPSS version 10 was used. Discrete variable like demographics, exercise, medical history,

tobacco use and family history of CAD was presented in percentages where as continuous variables like weight, height, blood pressure, blood glucose and total cholesterol was described as mean  $\pm$  S.D.

## RESULTS

A data of 174 school teachers recruited in Peshawar heart study (PHS) was analyzed for the frequency of CVD risk factors. Their mean age was  $42.95 \pm 8.29$  years and their mean duration of service was  $18.85 \pm 8.87$  years. Out of 174 school teacher 4 % (n=7) were known diabetic and 6.32% (n=11) had RBS of  $> 140\text{mg/dl}$ . CAD was found in 3.44 % (n=6) Table 1. Their mean BMI was  $26.60 \pm 4.53\text{Kg/m}^2$  and 35.05 % (n=61) were overweight and 47.07% (n=83) were found to be obese. Their mean waist circumference was  $96.29\text{cm} \pm 11.72\text{cm}$  and 75.28% had their waist circumference of  $> 90\text{cm}$  and their mean waist/hip ratio was  $.91 \pm .07$  and 64.36 % had their waist/hip ratio  $\geq .90$ . Their mean systolic blood pressure was 131 mmHg and 33.33 % (n=58) had systolic blood pressure  $\geq 140\text{mmHg}$  while their mean diastolic blood pressure 89mmHg and 59.77 % (104) had diastolic pressure  $\geq 90$  mmHg and Hypertension was present in 5.75% (n=10). Mean cholesterol was 168 mg/dl while 20.68% (n=36) had cholesterol of  $\geq 180\text{mg /dl}$ . Family history of CAD was present in 18.96% (n=33). Out of 174 teacher 41.4 % admitted that they were not doing regular exercise, and 58% gave no reason for not doing exercise while 39.7% said that they had no time for exercise and in 2.3% laziness was the reason for not doing exercise. Fifty eight percent subjects admitted to regular exercise and 44.8% used to do regular walk, 7.5% were doing cycling while 3.4% used to do jogging and 1.1 % were doing weight lifting. Out of 174 teachers 20.7% were using tobacco, 8.6% (n=15) were current cigarette smoker and 12.1% (n =21) were addicted to naswar and 2.9% were ex smokers (n=5).

**Table-1 : Current Medical Status (Total Numbers 174)**

Disease	Frequency	Percentage
Diabetics	7	4.023
Hypertensive	10	5.75
CAD	6	3.45

ECGs were also analyzed for various pathology like left ventricular hypertrophy (LVH), ischemic changes and various conduction abnormalities and it was found that 2.88% (n=5) were having LVH, 1.75% (n=3) were having right bundle branch block (RBBB) and 2.88% (n=5) have changes of previous myocardial infarction.

## DISCUSSION

Cardiovascular disease (CVD) is the leading cause of death in both the developed and developing world, accounting for 16.7 million deaths/year worldwide.<sup>11</sup> Extensive clinical and epidemiological studies have identified several factors that increase the risk of CVD. Some of these factors cannot be modified and are called non modifiable risk factors, like age, male sex, family history of CAD, and Asian ethnicity. While the modifiable risk factors are diabetes mellitus, hypertension, hypercholesterolemia, obesity, smoking, physical inactivity and high fat diet. The interheart study highlighted the importance of treating the corset of risk factors (hypertension, diabetes hypercholesterolemia, tobacco use, and obesity. That appears to contribute to the bulk of the risk for developing atherothrombosis. Diabetes is an important cause of small vessel disease including CVD.<sup>15</sup>

In our study the prevalence of diabetes was 5.75% and 6.32% had their RBS of  $\geq 140\text{mg/dl}$ . This was comparatively lower than study done in Karachi in which they demonstrated the prevalence of diabetes 22.1%.<sup>11</sup> This might due to the fact that our sample size was small and most of our subject in our study belonged to rural area of Peshawar.

In our study we demonstrated that 33.3 % had systolic blood pressure  $\geq 140\text{mmhg}$  while 59.77 % had their diastolic blood pressure  $\geq 90\text{mmhg}$  thus our result were consistent with the result of National Health Survey of Pakistan that revealed that one third of the Pakistani population over the age of 45 years had hypertension.<sup>6,11</sup>

High BMI has been independently associated with hypertension, diabetes, and central obesity in Pakistani population.<sup>16</sup> Obesity and metabolic

syndrome have been shown to frequently coexist.<sup>17</sup>

In our study we demonstrated that 35.05% subjects were overweight according to the Asian-specific BMI cutoff value of 23Kg/m<sup>2</sup> and 47.07% were obese according to the BMI cutoff value of 27Kg/ m<sup>2</sup>. This is more than the national representative survey of Pakistan in which over weight were 25.0% and obese were 10.3% according to Asian-specific cutoff value.<sup>13</sup> Lowering weight to the recommended target may be beneficial for optimal protection from metabolic syndrome and CVD.

There has been decline in the mortality from CAD in developing countries like USA, and Europe, this decline has been achieved both through wide spread use of effective therapies such as thrombolysis, aspirin, ACE inhibitors, statin, coronary bypass surgery and through reduction in major risk factors like hypertension, smoking and blood pressure. For example 10% decrease in the mortality came from a relatively small reduction (4.2%) in population total cholesterol.<sup>18</sup> In our study the hypercholesterolemia rate was 8.08%.The smoking rate in our study was 8.6 % while 2.9 % were ex smoker. This rate was comparatively less than other survey done in Pakistan, in which the smoking rate was 36.9 % with (95 % CI).<sup>19</sup> This might be the fact that in our study the subjects belonged to a noble profession of teaching that do not usually smoke and also preach others not to smoke.

Exercise and regular physical activity can result in moderate loss in body weight and adiposity. Endurance exercise also can promote decrease in blood pressure, serum triglycerides (TG) , increases in high density lipoprotein cholesterol, and improvement in insulin resistance, and glucose homeostasis, which along with modest weight reduction have been shown to reduce the risk of type 2 diabetes. Thus aerobic exercise favorably modify complex constellation of risk factors for type 2 diabetes and CVD.<sup>20</sup> In our study 42% subjects were not doing regular exercise, and interestingly despite educated were aware of the benefits of exercise but not actually practicing it.

In our study it has been proven that lack of exercise is very common in school teachers (41.4%) and this might be the reason of obesity and high blood

pressure in this relatively young population.

Since we are looking for CVD risk factors in different occupational groups of Peshawar in PHS so we will be able to know that which risk factor is common in particular group and we will devise a strategy accordingly. For example we have found in this study that lack of exercise is common and that have led to obesity and high blood pressure so just by encouraging exercise we can reduce weight and control blood pressure.

## CONCLUSION

Risk factor for CVD especially obesity, Hypertension, lack of exercise are frequent in school teachers.

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