

# FREQUENCY OF CARDIOVASCULAR RISK FACTORS AMONG PRISONERS

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## ABSTRACT

**Objectives:** To find out frequency of various risk factors for cardiovascular diseases in prisoners.

**Material and Methods:** This was an cross-sectional study involving prisoners recruited in Peshawar Heart Study (PHS). All participants were interviewed in detail including family history, past medical history, smoking history and drug history. All participants pulse, blood pressure, body mass index (BMI) and waist hip ratio was determined. Their random blood sugar and total cholesterol was checked. ECG was carried out. Data was analyzed for cardiovascular risk factors.

**Results:** Total of 166 prisoners were screened and interviewed. Mean age was 62 years. Mean BMI was  $26.52 \pm 4.59$ . Mean systolic BP was  $136.8 \pm 22.91$  mm Hg and mean diastolic BP was  $87.77 \pm 11.93$  mm Hg. Mean random blood cholesterol was  $178.91 \pm 29.12$ mg/dl. Mean random blood sugar was  $135 \pm 4.93$  mg /dl. Out of 166 prisoners, 20 (2%) had random blood sugar more than 180 mg /dl. Active smokers were 36 (21.7%). Most prisoners were not exercising 119 (71.7%).

**Conclusion:** We found that risk factors for cardiovascular diseases like lack of exercise, smoking, obesity and hypertension are quite frequent in this group.

**Key Words:** CVD risk factors, BMI, wait/Hip ratio, smoking, hypercholesterolemia.

## INTRODUCTION

Worldwide cardiovascular diseases (CVD) are the leading cause of death and a major cause of disability and lost productivity in adults.<sup>1,2</sup> In the United States, heart disease and stroke, the principal components of CVD, rank first and third respectively, among the leading causes of death. An estimated one in three U.S. adults (about 71.3 million) have one or more types of CVD<sup>1-3</sup>.

The prevalence increases with advancing age and varies within racial, ethnic, geographic, and sociodemographic groups. Although advancing age is the most powerful risk factor for CVD, about 62 percent of adults living with CVD are younger than

age sixty-five. In particular, men and women ages 55 to 64 are a special concern.<sup>2-4</sup> Among the main risk factors predisposing to cardiovascular disease, Diabetes Mellitus, Hypertension and Dyslipidemia are the leading factors. Several behavioral risk factors like over weight, physical inactivity, smoking are also associated with the development of CVD.<sup>1-4</sup>

Appropriate preventive practices are of central importance in managing all risk factors for atherosclerotic cardiovascular disease. It has been well documented that controlling modifiable risk factors for CVD improves mortality and morbidity from cardiovascular diseases.<sup>5-7</sup>

The aging population, obesity epidemic, under use of preventive strategies and suboptimal control of risk factors could exacerbate the future cardiovascular diseases. burden. Increased adherence to clinical and community-level guidelines and renewed emphasis on policy, environmental and lifestyle changes will be

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crucial for its effective prevention and control.

Although western data has clearly shown relationship of various occupational groups and cardiovascular diseases risk factors, local data is scarce in this regard. Aim of Peshawar Heart Study is to study the pattern of cardiovascular risk factors among various occupational groups serving in Peshawar and present study focuses on prisoners.

## MATERIALS AND METHODS

This was an cross-sectional study involving prisoners (central jail Peshawar) recruited in Peshawar Heart Study (PHS). All participants were interviewed in detail including family history, past medical history, smoking history and medications history. Dietary habits were explored. All participant's pulse, blood pressure, BMI and waist hip ratio was determined. Family history of CAD was considered to be positive if first degree relative had CAD at the age (men < 50 and women < 60).

Body mass index (BMI) and waist:hip ratio was calculated. Blood pressure was checked using mercury sphygmomanometer in sitting position with supported left arm. 12 Lead ECG was performed using BTL-085 machine. Random blood sugar was checked using Abbott Glucometer (Medisence Optium) by finger prick method. Serum random cholesterol was checked using Accutrend GC portable device (Roche) by finger prick method.

Data was analyzed for cardiovascular risk factors like hypertension, diabetes, smoking, Body mass index, waist:hip ratio, exercise, hypercholesterolemia and family history using SPSS Version 13. Hypertension was defined according to the JNC 7 Criteria. Diabetes was defined according to WHO Criteria. History of smoking was considered to be positive on the basis if 5 cigarettes were taken per day for  $\geq 6$  Months. Hypercholesterolemia was defined according to ATP-III guidelines.

## RESULTS

Total of 166 prisoners were screened and interviewed. Mean age was 62 years. Male prisoners were 146 (88%) while females were 20 (12.0%).

Married prisoners were 124 (74.7%), while 25 (15.1%) were unmarried. One was divorced and 16 (9.6%) were widowed.

Analyzing number of working hours, it was found that 43 (25.9%) were almost doing nothing most of the time while 23 (13.8%) were having on average working hours from 2 to 5 hours a day. Hundred prisoners (60.2%) reported that their working hours range from 6 to 12 hours a day approximately. Active smokers were 36 (21.7%). While 47 (28.3%) were addicted to Naswar. Mean BMI was  $26.52 \pm 4.59$  while 58 (35%) were having BMI between 25 to 29.9. thirty six (23.5%) were above 30 BMI. Waist: Hip ratio was more than 0.9 in 100 prisoners (60%)

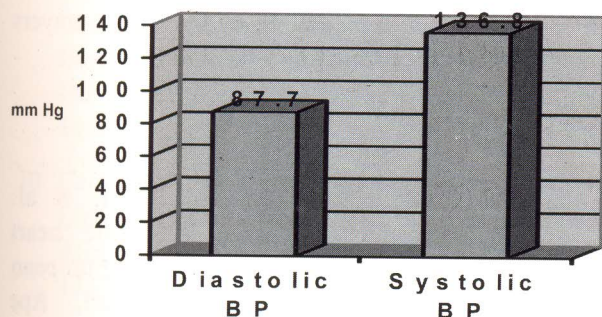
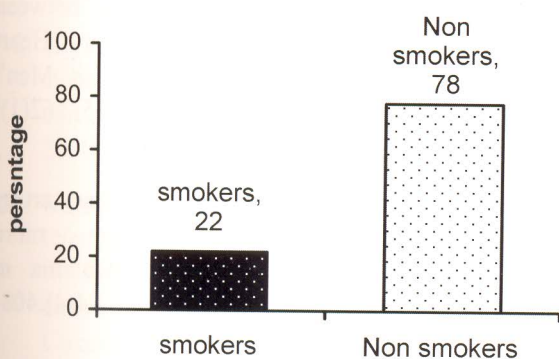
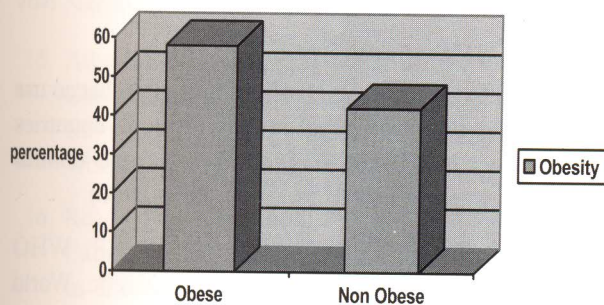
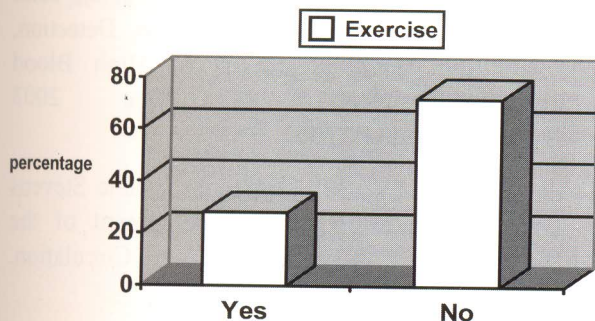
Food pattern was also analyzed in detail and it was found that prisoners consuming 50 to 500 grams of meat on average daily basis were 129 (77.5%) while 21 (12.0%) prisoners consumed meat in excess of 500 grams. About 83 (50%) were consuming largely vegetables in excess of 1400 grams a day. No fruit intake was reported in their meals by 98 (59%) prisoners.

Prisoners were asked about their daily prayers and it was found that 157 (94.0%) were offering prayers on regular basis while 8 (4.8%) were on irregular basis and one reported no prayers at all.

Mean systolic BP was  $136.8 \pm 22.91$  mm Hg while mean diastolic BP was  $87.77 \pm 11.93$  mm Hg. Fifty seven (57) prisoners (34.33%) had systolic BP more than 140 mmHg while 102 (61.44%) had diastolic BP more than 90 mm Hg. Mean Random Blood cholesterol was  $178.91 \pm 29.12$  mg / dl. Blood cholesterol more than 180 m/dl was found in 63 (37.95%) prisoners. Mean random blood sugar was  $135 \pm 4.93$  mg /dl Out of 166 prisoners, 20 (2%) had random blood Sugar more than 180 mg /dl. Prisoners not having any regular exercise schedule were 119 (71.7%).

## DISCUSSION

Epidemiological studies have identified a number of important risk factors for CAD<sup>1,2</sup>. These studies have demonstrated that most of the population attributable risk is explained on the basis of eight factors: abnormal lipids, smoking, hypertension, diabetes

**Mean BP in Prisoners****Figure - 1 : Mean Blood Pressure (mm Hg) in Prisoners****Figure - 2 : Frequency of smoking in prisoners****Figure - 3 : Frequency of obesity in prisoners****Figure - 4 : Frequency of exercise in prisoners**

mellitus, abdominal obesity, psychosocial factors, consumption of too few fruits and vegetables, too much alcohol and lack of regular physical activities.<sup>1-4</sup>

Smoking remains the number one preventable cause of CAD<sup>5,6</sup>. Much of the preventive strategies in western countries have been directed against this habit including cessation of smoking in public areas including hospitals, parks, bus and train station etc. According to WHO, 1 year after quitting smoking, the risk of CAD decreases by 50%.<sup>5,6</sup> We found considerable number of prisoners (21.7%) were addicted to smoking and this could be partially attributed to stressful life of this group of people.

Hypertension as an independent risk factor for development of CAD has been well established.<sup>7,8</sup> We found that considerable numbers of prisoners were having hypertension both systolic and diastolic. Alarmingly most of these people were completely unaware of the situation. Stressful life events and Obesity could be contributing to this finding.

Overwhelming evidence indicate that hypercholesterolemia and other lipids abnormalities provide an important risk factors for CAD.<sup>9,10</sup> Metabolic syndrome is a cluster of cardiovascular risk factor abnormalities associated with increased risk of type 2 diabetes mellitus, cardiovascular disease, and all-cause mortality. Elevated measurements of  $\geq 3$  of the following cardiovascular risk factors define the syndrome: waist circumference, blood pressure, fasting glucose, high-density lipoprotein (HDL) cholesterol, and triglycerides<sup>10,11-13</sup>.

Both primary and secondary CVD patients can benefit from the development of a regular aerobic exercise program, dietary modifications, and weight loss.<sup>13,14</sup> BMI is an easily obtainable measure that remains widely used as an indicator of overweight and obesity. Although other adiposity measures such as waist circumference may better capture the adverse metabolic changes that are likely to mediate the association between obesity and coronary heart disease.<sup>15,16</sup>

In our study we found considerable numbers of prisoners (52%) were having BMI more than 25. This was a significant finding. The prevalence of overweight and obesity is increasing in most

industrialized countries. Hypertension, hypercholesterolemia, and diabetes are among the clinical conditions that are important mediators of this association. Thus, obesity is an appropriate target for primary prevention efforts because its modification has the potential to influence several important clinical conditions. However, it is clear that achieving weight loss or preventing weight gain with aging is difficult for most individuals. Therefore, investigations of behavioral modifications that might reduce the impact of obesity is important.<sup>16-18</sup>

We also found that 71.7 % of prisoners were not having any regular exercise schedule and this could be partly contributing to obesity in this group. Lack of exercise is also important independent risk factors as already mentioned. Mortality caused by coronary heart disease (CHD) was reported to be inversely related to the level of physical activity and less in subjects who exercise regularly. There are reports indicating that physical training done less frequently than 2 days per week generally produces no meaningful change in  $VO_2\text{max}$ .<sup>19,20</sup>

Improving diet and lifestyle is a critical component of the American Heart Association's strategy for cardiovascular disease risk reduction in the general population. Specific goals are to consume an overall healthy diet; aim for a healthy body weight; aim for low cholesterol and triglycerides; aim for normal blood pressure; aim for a normal blood glucose level; be physically active; and avoid use of and exposure to tobacco products.<sup>21,22</sup> The recommendations are to balance caloric intake and physical activity to achieve and maintain a healthy body weight; consume a diet rich in vegetables and fruits; choose whole-grain, high-fiber foods; consume fish, especially oily fish, at least twice a week; limit intake of saturated fat to <7% of energy, and cholesterol to <300 mg/day by choosing lean meats and vegetable alternatives, fat-free (skim) or low-fat (1% fat) dairy products and minimize intake of partially hydrogenated fats; minimize intake of beverages and foods with added sugars; choose and prepare foods with little or no salt<sup>23,24</sup>.

## CONCLUSIONS

We found that risk factors like physical inactivity and sedentary life style, obesity and hypertension were

quite frequent in this group. Preventive measures like motivation regarding regular exercise, awareness about maintaining a healthy weight and BMI. Stress full life events could be addressed by regular prayers and recitation of the Qur'an.

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