

**Prevalence of Coronary Heart Disease risk persons in South Dagon Township,
Yangon, Myanmar**

**Ye Tint Lwin, *Zaw Myint, *Myo Myo Mon, *Aye Aye Win, *Hay Mar Hpoo,
*Maung Maung Myint, *Mya Mya Win, **Myint Kyi Aye & *Soe Min Thein*

**Physiology Research Division
Department of Medical Research (Lower Myanmar)
**Department of Health*

To find out the prevalence of coronary heart disease risk persons, the community-based cross-sectional descriptive study was conducted on 40 - 60 years old, 293 men and 327 women from South Dagon Township, Yangon, Myanmar. The coronary heart disease risk factors were investigated. The prevalence of coronary heart disease risk persons was scored in accord with the coronary heart disease risk appraisal (RISKO) developed by the Michigan heart association and it was found to be 43.3% in total (46.1% in men and 40.7% in women). Hypercholesterolemia (Total cholesterol >250 mg/dl) rate (28.1%) and lack of regular exercise (71.3 %) in women showed significantly higher than those of men (14.0 % and 26.6% respectively). History of smoking and hypertension was detected with significant male preponderance (72% in men versus 29.7% in women and 16.7% in men versus 10.1% in women respectively). History of cardiovascular disease in relatives was present in 44.3% of women and 36.2% of men. Over-weight was found in 15.6% of women and 13.3% of men. This study highlighted the important role of smoking and hypertension control in men and body weight, dietary control and regular exercise in women, in order to reduce coronary heart disease risk.

INTRODUCTION

The term "risk factor" in relation to cardiovascular disease and specifically coronary heart disease was used for the first time in 1961 in a paper on the Framingham study [1]. The risk factors themselves in particular high levels of cholesterol, hypertension and smoking have been measured in prospective epidemiological studies since their discovery in late 1940s. Over the years, much has been learned about risk factors in terms of understanding and recognition of new predictors of risk. The following is the list of the most frequently implicated of risk factors that identify men, women and children at high risk for coronary heart disease - diet, elevated blood lipids, hypertension,

cigarette smoking, high uric acid level, family history, obesity, Diabetes Mellitus, stress and sedentary life style [2]. However, it is difficult to determine quantitatively the importance of any single risk factor in comparison to any other because many of the factors are interrelated and the risk is being increased if several of them are present at the same time.

With the change in economy, industrialization and change in life style, the major health problems of the nations in Asian Pacific region tend to shift from the infection and malnutrition to metabolic and cardiovascular ischemic diseases. In Myanmar, according to the report of cardiovascular disease project, prevalence rates of ischemic heart disease were 42.68 in

rural area and 75.51 in urban area in 1982 [3] and 42.0 in rural area and 57.9 in urban area in 1992 [4].

These risk assignments are often valuable for screening in the overall assessment of current risk and life style behavior. Optimal screening for high risk requires methods that will detect the largest possible number of persons destined to develop in future. Risk inventories and appraisal have been developed to quantify an individual's susceptibility to Coronary Heart Disease. A popular risk inventory (RISKO), which is developed by the Michigan Heart Association, is simple and easy to conduct [5]. The present study is aimed to find out the prevalence of Coronary Heart Disease risk persons at the present situation in a township of Myanmar.

Objective

To determine the prevalence of Coronary Heart Disease risk persons in South Dagon Township, Yangon, Myanmar.

MATERIALS AND METHODS

Study design

A cross-sectional descriptive study.

Study population

Both males and females of 40 to 60 years old living in South Dagon Township were studied.

Sample size determination and sampling procedure

In South Dagon Township, 12 wards were randomly selected for the study. From each ward, 60 subjects both male and female, 40 to 60 years old were selected by simple random sampling method. A total of 620 males and females were included in this study. Those taking anti-hypertensive drugs, drugs that could affect blood cholesterol

level and those who were acutely ill were not included.

Data collection methods

- (1) Proper history taking was done including name, age, sex, occupation, address, number of relatives having cardiovascular diseases, smoking habit (type and numbers/day) and physical activity.
- (2) Body weight was measured up to 0.1 kg on a portable Bathroom type scale with the subject clothed but shoeless.
- (3) Body height was measured up to 0.1 cm by a stadiometer with the subject shoeless.
- (4) Blood pressure measurement was carried out according to method described by World Health Organization [6].
- (5) Serum total cholesterol level was measured by using cholesterol RTU test kit based on enzymatic method [7].
- (6) Relative Risk categories were carried out according to Coronary Heart Disease Risk Appraisal (RISKO) developed by Michigan Heart Association [5].

Data analysis

Summary of measurement of various categories, scoring of each sample according to their various parameters as risk, categorization by risk scores into very high, high, moderate, average, below average and well below average were carried out. The prevalence of each risk factor was carried out for males and females respectively. The difference in prevalence of each risk factor between men and women were analyzed by Pearson Chi-square test. Significant difference was considered with a $p < 0.05$.

RESULTS

Table 1 shows the general characteristics of the subjects.

Table 1. General characteristics of the subjects

	Total	Male	Female
Number of subjects	620	293	327
Age (yr)	49.43 ± 5.85	49.95 ± 6.05	48.97 ± 5.63
Height (cm)	156.64 ± 7.84	162.34 ± 5.73	151.53 ± 5.65
Weight (kg)	54.75 ± 12.55	57.30 ± 12.25	52.46 ± 12.38
Total cholesterol (mg/dl)	216.04 ± 50.47	206.81 ± 47.16	224.32 ± 51.95
Blood Pressure (mmHg)			
-Systolic	125.28 ± 20.55	127.96 ± 21.05	122.87 ± 19.81
-Diastolic	85.73 ± 12.67	87.92 ± 13.20	83.78 ± 11.87
Occupation			
-Manual workers	154 (24.84%)	90 (30.72%)	64 (19.57%)
-Sedentary workers	238 (38.39%)	175 (59.73%)	63 (19.27%)
-Retired persons	35 (5.65%)	28 (9.58%)	7 (2.14%)
-Dependents	143 (31.13%)	--	193 (59.02%)

Figure 1 shows frequency distribution of coronary heart disease risk persons according to their relative degree of risk scored by coronary heart disease risk appraisal (RISKO). In the study population, 4.68 % was at high risk, 38.55 % was at

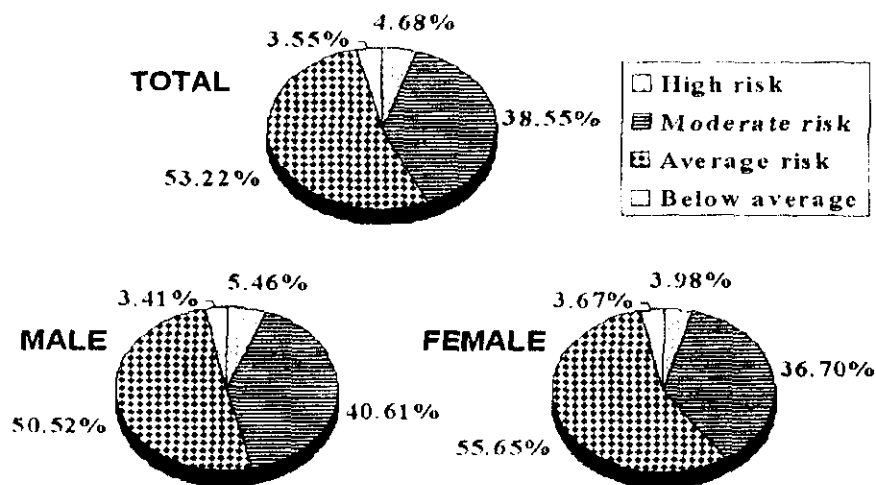


Figure 1. Frequency distribution of coronary heart disease risk persons according to their relative degree of risk scored by coronary heart disease risk appraisal (RISKO)

moderate risk, 53.23 % was at average risk and 3.55 % was at risk below average. In men, 5.46% was at high risk, 40.61% was at moderate risk, 50.51% was at average risk and 3.41% was at risk below average. In women, 3.98 % was at high risk, 36.70 % was at moderate risk, 55.66 % was at average risk and 3.67 % was at risk below average.

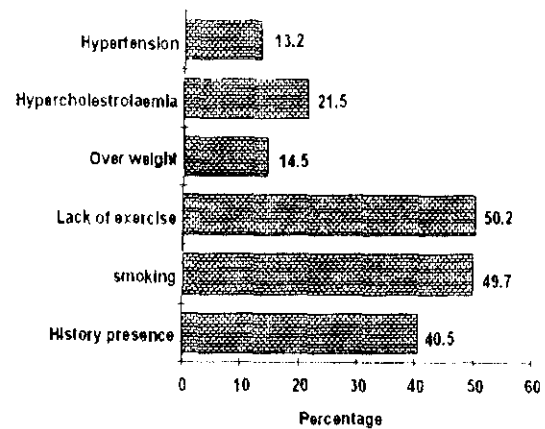


Fig. 2. The prevalence of risk factors in the study population

Figure 2 shows bar chart of the prevalence of risk factors in the study population. Of total study population, 49.8 % was found to have lack of exercise, 49.7 % was smoker, 21.5 % had hypercholesterolemia, 14.5 % was over-weight, 13.2 % had hypertension

and 40.5 % had history of cardiovascular diseases in relatives.

Table 2 shows comparison of proportions of various coronary heart disease risk factors between male and female. Lack of regular physical activity and exercise was found in 71.3 % of women and 26.6 % of men. Seventy-two percent of men and 29.7 % of women were smokers. History of cardiovascular disease in relatives was present in 44.3 % of women and 36.2 % of men. Hypercholesterolemia was found in 28.1 % of women and 14.0 % of men and 15.6 % of women and 13.3 % of men were found to be over-weight. Hypertension was detected in 10.1% of women and 16.7 % of men.

Table 2. Comparison of the prevalence of various coronary heart disease risk factors between men and women

Risk factors	Men	Women	Differ- ence 'p' value
	(% of total male)	(% of total female)	
Presence of history of disease in relatives	36.2 %	44.3 %	0.039
Smoking	72.0 %	29.7 %	< 0.001
Lack of exercise	26.6 %	71.3 %	< 0.001
Over weight	13.3 %	15.6 %	0.420
Hypercholes- terolemia	14.0 %	28.1 %	< 0.001
Hypertension	16.7 %	10.1 %	0.015

DISCUSSION

There are many approaches in identifying prevalence of coronary heart disease in community such as WHO questionnaire, Rose chest pain questionnaire, Minnesota coded electrocardiographic criteria or ischemic chest pain. Each method has both advantages and disadvantages. However, this study was not intended to find out the prevalence of coronary heart disease. This was the study of the prevalence of coronary heart disease risk persons using a popular risk inventory (RISKO), which is simple

and easy to conduct. The study detected individuals and population at elevated risk of coronary heart disease. In prevention of coronary heart disease, it is also highly desirable at maximum screening efficiency by including persons or population at risk. The prevalence of high-risk persons is 43.3 % in total, 46.1 % in males and 40.7 % in females respectively.

Many risk factors are associated with each other as well as with coronary heart disease itself. With one risk factor a forty-five years old man's chance of coronary heart disease is approximately 2 times greater than a man with no risks. With three risk factors, this man's chance for getting angina, heart attack or sudden death is five times higher than if he had no risk factors [1]. In the study population, one risk factor was noted in 30.3% of total (35.5% of men and 25.4% of women), two risk factors in 35.5% of total (35.2% of men and 35.8% of women) and three risk factors or more in 26.4% of total (21.8 % of men and 30.5 % of women). Only 7.7 % of total (7.2 % of men and 8.3 % of women) was free from risk factors.

Smoking prevalence, recognized by the World Health Organization as an extremely serious health problem of the third world, was also extremely prevalent in male population (72%). This prevalence was even greater than that of the WHO-MONICA Project (34 - 62%) [8]. However, overall prevalence of smoking in this study was 49.7% which was comparable to that (47%) reported by Cardiovascular Disease Project (Myanmar) in 1993 [4]. Among the smokers, men had significant higher rate than that of women ($p < 0.001$).

The strong association between elevated blood pressure and coronary heart disease in men and women had been demonstrated in a number of prospective studies. A mean decrease of 6 mmHg diastolic blood pressure significantly reduced in fatal and nonfatal coronary heart disease by 14 % [2]. If hypertension is defined as blood pressure

equal to and greater than 160/95 mmHg, the prevalence rate of hypertension in the study population was 9 % which was much lower than that (14.5%) reported by Cardiovascular Project (Myanmar) in 1993 [4]. If hypertension is defined as blood pressure equal to and greater than 140/90 mmHg, the prevalence rates were 16.7% in men and 10.1% in women respectively. These values were also lower than those men (24 %) and women (17%) in rural population of India (9). In this study, hypertension was detected with male preponderance ($p < 0.015$).

Another modifiable factor hypercholesterolemia is a well known factor that 2 - 3% decline in coronary heart disease has been associated with 1% decline in serum cholesterol level [2]. Hypercholesterolemia (> 250 mg/ dl) was noted in 21.5% of the studied population and it was higher than that reported by Cardiovascular Disease Project (Myanmar) in 1993. If hypercholesterolemia is taken as > 200 mg/dl, it occurred in 57.7% of the study population, which was much higher than that (22%) of people in rural population of India. Hypercholesterolemia rate was found to be significantly greater in women than men ($p < 0.001$).

It had been mentioned in the report of Cardiovascular Project (Myanmar) in 1993 that obesity was not found in the studied Townships [4]. However if over-weight was defined as body weight having 6 lbs. above the height adjusted healthy body weight, 15.6% of women and 13.3% of men were found to be over-weight in this study.

Physical inactivity, whether occupational or recreational, is associated with increased risk of coronary heart disease independently of other risk factors. The relative risk of fatal heart attacks among sedentary individuals is approximately twice that of more active men and women. The mechanism whereby exercise apparently protects against coronary heart disease may include its effects on blood pressure, serum

lipoprotein profiles, and obesity and insulin resistance [2]. In study population, half (50.2%) was found to have lack of regular physical activity and it was more marked in women (71.3%) than men (26.6%).

CONCLUSION

This study may provide some information to Cardiovascular Disease project concerning the prevalence of coronary heart disease risk in South Dagon Township. The study highlighted the important role of smoking and hypertension control in men and body weight, dietary control and regular exercise in women, in order to reduce coronary heart disease risk in South Dagon Township.

ACKNOWLEDGEMENT

We would like to thank the Director-General of the Department of Medical Research (Lower Myanmar) for his keen interest and kind permission to conduct this project. Our heartfelt thanks are also extended to local authorities and all the health staff of the South Dagon Township. Last but not the least we owe our gratitude to all the respondents of this study without whom our study would not have been possible.

REFERENCES

1. Castle W.P. Epidemiology of Coronary Heart Disease: The Framingham study. *The American Journal of Medicine* 1984; 76: 4 - 12.
2. WHO Scientific Group. Cardiovascular disease risk factors: new areas for research. WHO Technical Report Series. 841. Geneva. World Health Organization: 1994.
3. WHO Cardiovascular Disease Project (Burma) Epidemiology of cardiovascular diseases. Preventive cardiology for community health. Handbook for basic health service. 1986.
4. Aung, Myo Thet Tun, Thein Ngwe, Nyan Tun and May Mon Kyaw. Prevalence of Cardiovascular Diseases in rural area of Hmawbi and urban Yangon city. *Asia Pacific Journal of Public Health* 1993; 6 (4): 188 - 194.

5. Mc Ardle W.D. Physical activity, health and aging. In Mc Ardle W.D, Katch F.I and Katch V.L. editors. *Exercise Physiology*. William & Williams.USA: 1996.
6. WHO Scientific Group. Arterial hypertension. WHO Technical Report Series. 682. Geneva. World Health Organization. 1987.
7. Flegg H.M. An investigation of the determination of serum cholesterol by an enzymatic method. *Annals of Clinical Biochemistry* 1973; 10: 79-84.
8. The WHO MONICA Project. Geographical variation in the major risk factors of Coronary Heart Disease in men and women aged 35-64 years. *World Health Statistics Quarterly Rapport* 1988;41: 115-1389.
9. Gupta R, Porkach H, Gupta V.P and Gupta K.D. Prevalence and determinants of coronary heart disease in rural population of India. *Journal of Clinical Epidemiology*.1997; 50 (2): 203-209.