Distribution of cardiovascular risk factors among the cardiology outpatient population in RIPAS hospital, Brunei Darussalam

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ABSTRACT

Introduction: Cardiovascular disease is the second leading cause of mortality (12.5%) in Brunei Darussalam after cancer and there is minimal data regarding this disease in Brunei. The objective of this study is to describe the distribution of risk factors among cardiology clinic outpatient population in RIPAS hospital. **Methods:** A retrospective study looking into the prevalence of cardiovascular risk factors in cardiology outpatient population in RIPAS hospital was carried out. Risk factors collected were: age, gender, total cholesterol, high density lipoprotein, hypertension, last recorded blood pressure, diabetes and smoking status. Previous history of cardiovascular events within the last 5 years was also recorded and 10-year coronary heart disease risk was estimated for the population using the Framingham risk score using the one based on total cholesterol level. **Results:** Seventy-four percent of the population that attended cardiology outpatient clinic were between 40 to 70 years of age. The prevalence of diabetes, hypertension, hyperlipidaemia and smoking were 34%, 67%, 36% and 15% respectively. Number of smokers among females was significantly lower compared to males, and females were found to have significantly higher levels of high density lipoprotein compared to males. Out of 325 patients, 78 (23%) males and 56 (17%) females had a previous history of cardiovascular event. About 91.7% of the total population has at least one risk factor and 1.2% has all four risk factors. 10% of the study population were considered to be of high 10 year risk of coronary heart disease based on the Framingham Risk Score. **Conclusion:** The most prevalent risk factor is hypertension (67%). About 91.7% had at least one risk factor and 10% was considered to have a high 10 year risk of coronary heart disease. We hope that this study will provide good baseline data for future cardiovascular research in Brunei.

Keywords: Coronary disease, hyperlipidaemia, diabetes mellitus, hypertension, Brunei

INTRODUCTION

There is minimal information with regards to cardiovascular disease in Brunei Darussalam. According to the 2012 Ministry of Health's Health information booklet, cardiovascular disease was the second leading cause of mortality (12.5%, 38/100,000 population) in Brunei after cancer. Cardiovascular disease accounted for 1,728 inpatient morbidity in the year 2012. [1] The objective of this study is to

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study is to describe the distribution of risk factors among cardiology clinic outpatient population in RIPAS hospital.

MATERIALS AND METHODS

A retrospective study looking into the prevalence of each risk factor in cardiology outpatient population in RIPAS hospital was carried out. Patients who attended cardiology outpatient clinic in 2006 and 2007 were selected randomly from the clinic appointment book. Exclusion criteria were patients less than 30 years old, patients with cardiovascular congenital defects, patients with cardiovascular disease secondary to infectious causes, secondary to trauma and secondary to neoplasms. Our target sample size was at least 300 patients.

A standardised form was used to collect data and was performed by three individuals. Risk factors collected were: age, gender, total cholesterol, high density lipoprotein, hypertension, last recorded blood pressure, diabetes and smoking status. Previous history of cardiovascular events within the last five years was also recorded. Cardiovascular events were defined as the following events: angina, myocardial infarction (MI), angioplasty, coronary artery bypass grafting surgery, transient ischaemic attack (TIA), ischaemic stroke and incidents secondary to peripheral vascular disease.

We also estimated the 10-year coronary heart disease risk using the Framingham risk score using the one based on total cholesterol level. [2]

To ensure no duplications, we used the Medical Record Number as identifiers and the data were analysed using Microsoft Excel. Further statistical analysis included Unpaired T -test and Chi-Square test analysis which was carried out using GraphPad PRISM, version 6.01.

The study underwent ethics approval by RIPAS hospital ad hoc ethic committee through Medical Education office. Data were kept anonymised to preserve confidentiality.

RESULTS

The study sample was 325 patients and comprise of 155 females and 170 males. Average age was 56.91 ± 1.02 years and 57.3 ± 1.06 years for both male and female respectively (p=0.821). Seventy-four percent of the patients were aged 40 to 70 years, and a third were between 50 and 60 years old as seen below in Table 1.

Of the patients, 67% (n=218) had hy-

Table 1: The prevalence of hypertension, diabetes, smoking and hyperlipidaemia.

Age group (years)	n (%)
≤ 40	35 (10.8)
41-50	71 (21.8)
51-60	99 (30.5)
61-70	70 (21.5)
71-80	34 (10.5)
81-90	13 (4.0)
≥ 90	3 (0.9)
Gender	
Male	170 (52.3)
Female	155 (47.7)
Comorbid conditions	
Hypertension	218 (67.1)
Hyperlipidaemia	116 (35.7)
Diabetes mellitus	110 (33.8)
Smoking	48 (14.8)
Risk factors for cardiovascular disease	
None	27 (8.3)
1	129 (39.7)
2	108 (33.2)
3	57 (17.5)
4 or more	4 (1.2)

pertension, 110 (34%) had diabetes mellitus and 116 (36%) had hyperlipidaemia (Table 1).

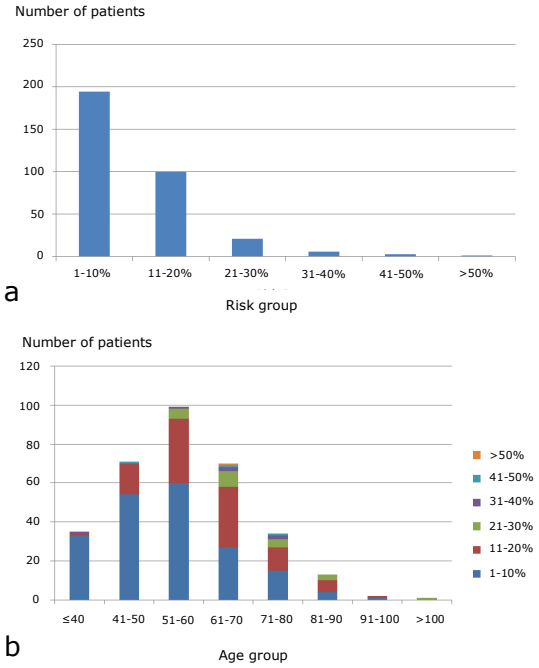
Overall, 91.7% (n=298) of the total population has at least one risk factor with most having at least one or two risk factors (Table 1).

Among those with smoking status recorded (not recorded, n=16, 5%), 48 (15%) were current smokers, and 40 (12%) were ex-smoker.

Out of 325 patients, 78 (23%) males and 56 (17%) females had a previous history of cardiovascular event. Comparisons between the genders showed some differences (Table 2). There were significantly less current smokers in females compared with males (p<0.05). High density lipoprotein level was found to be higher among female patients and this is also statistically significant. No difference was found for the prevalence of hypertension, hyperlipidaemia and diabetes. No difference was also found for mean total cholesterol as well as the ratio of total cholesterol to high density lipoprotein between males and females.

Table 2: Comparisons between male and female patients.

	Male	Female	*p* value
Hypertension	111 (65%)	107 (70%)	0.787
Diabetes	54 (32%)	56 (36%)	0.849
Smoking	33 (19%)	15 (9.6%)	0.009
Hyperlipidaemia (TC>5mmol/L)	55 (32%)	61 (39%)	0.310
Total Cholesterol (TC)	8.16 ± 3.44	4.75 ± 0.08	0.343
High Density Lipoprotein (HDL)	1.05 ± 0.02	1.21 ± 0.03	<0.0001
TC:HDL	7.74 ± 3.04	4.20 ± 0.11	0.268



Figs. 2: a) Breakdown of the 10-year Framingham cardiovascular risk, and b) cardiovascular risk groups in the different age groups.

Estimated 10-year risk of coronary heart disease: 10% of the study population were in the high risk group (risk >20%) while 60% were in the 1-10% low risk group and remaining 30% in intermediate 11-20%. The risk distribution by age is shown below in Figures 2b.

DISCUSSION

The age distribution of the clinic population followed a normal distribution. Intermediate risk of coronary heart disease starts to be more prevalent once they are 40 years and above, and the risk profiles of the both male and female population were almost similar except for high density lipoprotein profile and prevalence of current smokers.

The amounts of unreported data with regards to risk factors were minimum; 4% for hypertension and 5% for smoking status. Most of the risk factors that we were interest-

ed in was located in the patients' history and screening questionnaire; the data gathering exercise was tedious and difficult to locate sometimes. It is expected that with the introduction of Bru-HIMS (Brunei Darussalam Healthcare Information and Management System), keeping complete records will be easier and more accessible.

The prevalence of diabetes, hypertension, hyperlipidaemia and smoking were 34%, 67%, 36% and 15% respectively. This is comparable to the prevalence of diabetes, hypertension and smoking among the elective group in the Euro Heart Survey which were 30%, 67%, and 22% respectively with the exception of hyperlipidaemia which was 72%. [3] The difference in prevalence of hyperlipidaemia between the two sample are due to the latter include patients on on-going lipid-lowering treatment whereas not for the former. This suggests that the risk profile of the cardiology outpatient popultaion in Brunei is similar to European elective population.

About 91.7% of the population has at least one risk factor and this finding is similar to a study by Khot *et al.* looking prevalence of conventional risk factors in patients with coronary heart disease which found that 80-90% of patients with coronary heart disease have conventional risk factors. [4] The other 8.3% could be explained by other unaccounted cardiovascular risk factors such as genetic factors, activity levels, obesity, etc. [5-7]

The prevalence of smokers among female patients was significantly lower compared to male patients. This is a common finding in low to middle income countries or countries in this region. [8, 9] HDL was also found to be significantly higher in females which is expected as HDL has a predominance towards female patients. [10]

Based on the Framingham risk score, 10% of the population was considered to be of high risk. The Framingham study was based on Caucasian population and its applicability to the Brunei population is unknown. [2]

Out of 325 patients, 78 (23%) males and 56 (17%) females had a previous history of cardiovascular event. The Framingham risk score was derived from people who did not have any overt coronary heart disease. Our study unfortunately did not distinguish the different cardiovascular events and it is uncertain if a large proportion of them were secondary to coronary heart disease. However, if we were to follow up this set of patients over 10 years (i.e. 2016-2017) with regards to coronary heart disease incidence, and comparison of this population to Brunei general population studied, a modified Framingham risk score for Brunei Darussalam can potentially be created.

This study is a descriptive cross-sectional study which looked at cardiology outpatient clinic patients and it is quite unlikely that the data can be generalised to the general population of Brunei. However, we hope that this study would provide some baseline data that can be build on for future cardiovascular epidemiology study of Brunei population.

In conclusion, the most prevalent risk factor is hypertension. About 91.7% had at least one risk factor and 10% was considered

to have a high 10 year risk of coronary heart disease. We hope this study would provide useful baseline for future cardiovascular epidemiological study of Brunei population.

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