

SMOKING PROFILE AND CORONARY RISK AMONG PATIENTS ADMITTED TO THE CORONARY CARE UNIT, GENERAL HOSPITAL, KUALA LUMPUR.

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SUMMARY

A six-month survey of 828 patients admitted to the Coronary Care Unit (CCU) of the General Hospital, Kuala Lumpur was carried out to ascertain whether the smoking habits of the patients predisposed them to definite coronary events and its immediate outcome i.e. early mortality (within seven days). The various ethnic groups were also screened to determine if they were at increased risk to coronary events in relation to other known risk factors.

Three hundred and eleven patients – 239 males, and 72 females – had confirmed acute myocardial infarctions of whom 190 were smokers (172 males, and 18 females). Sixty-nine infarct patients died within the first seven days post-MI: 35 were smokers (50.7%). Two-hundred and eighty other patients had non-infarct coronary events. Of these,

167 were smokers. In contrast, only 99 out of 237 patients admitted for non-coronary events, were smokers.

It thus appeared that patients admitted to the CCU for suspected cardiac events had a greater incidence of confirmed acute myocardial infarction or acute coronary events if they were smokers ($p < 0.001$). Mortality from these coronary events was not seen to increase among smokers in this population sample. Women who smoked as a whole, were not found to be at increased risk to coronary events, but women smokers 60 years and older were shown to be at increased risk to developing confirmed coronary events ($p < 0.01$).

KEY WORDS

Smoking, coronary risk factors, coronary artery disease, acute myocardial infarction, coronary care unit, smoking profile.

INTRODUCTION

Cigarette smoking is a major risk factor in coronary heart disease.¹ The association between cigarette smoking and heart disease is greater for myocardial infarction and sudden death than for stable angina pectoris.² It is further known that the relative risk increases with the number of cigarettes smoked, and that the risk is greater in the younger adults (< 45 years) than with the older (55 to > 65 years).²

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In Malaysia, cardiovascular diseases had the dubious distinction of being the premier cause of all medically-certified hospital deaths for the past seven years.³ Coronary heart disease formed the bulk of these deaths, i.e. 2,063 of 6,753 (31%) reported cardiovascular deaths in 1982 in Peninsular Malaysia alone.⁴ Excess cardiovascular deaths had been attributed to variable causative factors including smoking, uncontrolled hypertension, diabetes, hyperlipidaemia, imprudent dietary practices, and even lifestyle. The US Surgeon-General suggested that cigarette smoking contributed to at least 25–33% of all cardiovascular deaths.⁵

The smoking prevalence in Malaysia is not well documented. Local studies by Teoh⁶ suggest that some 21–56% of smokers can be found in various population groups in Malaysia, i.e. among soldiers, secondary school students, medical students and, even doctors. At a health-screening campaign in Ipoh held in 1985, Teoh found that 38% of males and 3.5% of females among 1800 admitted to being current smokers. Pathmanathan⁷ has shown that in a Negeri Sembilan rural community, 34.2% of adults were smokers with a male-female ratio of 2:1.

A study was conducted to survey the smoking profile of patients who were admitted to the Coronary Care Unit (CCU) of the Kuala Lumpur General Hospital suspected of cardiac disease. The smoking prevalence was then correlated to the demographic profile of those patients who had confirmed acute myocardial infarction early in-hospital deaths, and other coronary or cardiac events. Other risk factors were also looked at, to find out if cigarette smoking was the only independent risk factor in coronary heart disease.

METHODOLOGY

From August 1986 to January 1987 inclusive, all patients admitted to the Coronary Care Unit of the General Hospital Kuala Lumpur, were interviewed for smoking habits as well as for other known risk factors such as concomitant hyper-

tension, diabetes mellitus and hyperlipidaemia. All these patients were then prospectively analysed to confirm their coronary status. Out of 828 studied, 594 were males and 234, females.

Age, sex, ethnic group, and smoking status were obtained from a standard questionnaire. A respondent who smoked was asked detailed questions on the number of cigarettes smoked per day, duration of smoking habit, and how long it had been since the respondent quit smoking. Other risk factors, i.e. hypertension, diabetes mellitus and hyperlipidaemia were then obtained from historical records or from preliminary clinical investigations. Hypertension was defined as arterial blood pressure exceeding 160 mmHg systolic and/or 90 mmHg diastolic, taken on at least two separate occasions, using the standard cuff size (13 cm) and the mercury sphygmomanometer. Diabetes mellitus was defined according to a WHO criterion. Where possible, a fasting serum lipid profile was estimated in patients who stayed beyond one week in the CCU. The blood sample was taken on the seventh morning after an overnight ten-hour fast.

Diagnostic Criteria

Acute myocardial infarction was diagnosed when two of the following criteria⁸ were obtained: 1) Typical central ischaemic chest pain lasting more than 30 minutes; 2) typical serial electrocardiographic changes of either pathological Q or non-Q evolution and ST-T changes (elevation or depression of at least 0.1 mV) in two or more leads in a standard 12-lead ECG; 3) serial cardiac enzyme elevation of more than one-and-a-half times the upper limit of normal in at least two of the following: creatine kinase, lactic dehydrogenase and aspartate transaminase.⁹

Other acute coronary syndromes were included under the group called Coronary Artery Disease (or CAD). These comprised of unstable angina, acute coronary insufficiency, crescendo angina, print metal angina, and acute pulmonary oedema secondary to previous ischaemic heart disease. Unstable angina was defined as ischaemic chest

pain of recent onset, of increasing progression in frequency and/or duration, angina at rest or unrelieved with sublingual nitroglycerin, where no diagnostic ECG changes or serial cardiac enzyme changes were found. Acute coronary insufficiency or crescendo, or pre-infarction angina were variously defined by physicians admitting their patients into the coronary care unit. In general, the various terms were synonymous with unstable angina i.e. ischaemic chest pain of progressive duration, intensity and frequency not relieved by sublingual nitroglycerin, where minor ST-T changes were noted without pathological Q-wave evolution or cardiac enzyme elevation.

All other patients were included under the group called Non-Coronary Artery Disease (non-CAD). These are patients who were admitted to the CCU because of suspected coronary events or complications, but whose final diagnoses were non-coronary in aetiology. These included the following diagnoses: cor pulmonale, cardiomyopathic congestive heart failure, cerebrovascular events, primary valvular heart diseases (rheumatic, infective or calcific), massive pericardial effusion (uraemic, hepatic or malignant), sinoatrial dysfunction, arrhythmias (paroxysmal supraventricular tachycardia, atrial fibrillation, non-ischaemic ventricular tachycardia or fibrillation), exacerbation of chronic obstructive lung disease, severe pneumonias, severe asthmatic attacks, septicaemia, pulmonary embolism and respiratory arrest due to other non-cardiac illness.

Patient Groups

Of the 594 males and 234 females, 411 (69.2%) and 45 (19.2%) respectively, were smokers. Of these smokers, 138 (33.6%) males and seven (15.6%) females smoked more than 20 cigarettes per day. There were 372 (44.9%) – 183 males and 189 females – nonsmokers. The ethnic group distribution was as follows: Malays – 289 (34.9%), Indians – 249 (30.1%), Chinese – 258 (31.1%) and others inclusive of Sikhs, Caucasians, and Eurasians – 32 (3.9%). It should be pointed out that Malaysia's population distribution in Peninsular Malaysia for 1982 was 55.7% Malays,

33.4% Chinese, 10.2% Indians and 0.6% others.¹⁰

Statistical Analysis

The data suggested partitioning. Therefore, the patients were divided into three discrete groups reflecting the diagnoses of confirmed Acute Myocardial Infarction (AMI), (CAD) (non-CAD). Analyses were made comparing either AMI, CAD or both to the non-CAD group for the prevalence of smokers, using the 'fourfold' table. Since these data represent discrete noncontinuous outcome variables, we used the chi-square analysis with the Yates' correction i.e.

$$\text{chi-square} = \frac{(ad - bc - \frac{1}{2}(a + b + c + d))^2}{(a + b)(c + d)(a + c)(b + d)}$$

The proportion of patients in each group was related to smoking as a risk factor. The null hypothesis in each case meant that the prevalence of cigarette smoking was not associated with increased coronary events when compared to the subset of patients who did not have proven coronary events ($P < 0.05$ was considered statistically significant).¹¹

RESULTS

As a whole, patients admitted into the coronary care unit had some sort of cardiac or acute respiratory problem misdiagnosed as cardiac. Of the 828 patients surveyed over the period of six months, 591 had some coronary heart disease whether acute myocardial infarction or other syndromes described under 'coronary artery disease'. Confirmed to have acute myocardial infarction were 311 patients, of which 190 (61.1%) were smokers. The other 280 patients had non-infarct coronary syndromes which included unstable angina and pulmonary oedema secondary to ischaemic heart disease previously; 167 (59.6%) were smokers. This contrasted with the other 237 non-coronary patients, where only 99 (41.8%) were smokers (Table 1). This difference in prevalence of smoking in the two subgroups, AMI and CAD and non-CAD, was statistically significant ($p < 0.001$).

TABLE 1
SMOKING PROFILE OF PATIENTS IN THE CORONARY CARE UNIT,
GHKL (AUGUST 1986 TO JANUARY 1987)

Patients	AMI	CAD	AMI + CAD	Non-CAD	Total
Males	239	212	451	143	594
Smokers	172**	153ns	325**	86	411
Heavy smokers (> 20 cigarettes/ day	63	44	107	31	138
Non-smokers	67	59	126	57	183
Females	72	68	140	94	234
Smokers	18ns	14ns	32ns	13	45
Heavy smokers (> 20 cigarettes/ day	2	3	5	2	7
Non-smokers	54	54	108	81	189
Males + Females	311	280	591	237	828
Smokers	190***	167***	357***	99	456
Heavy smokers (> 20 cigarettes/ day	65	47	112	33	145
Non-smokers	121	113	234	138	372

*** P < 0.001; **P < 0.02; *P < 0.05; ns = not significant. AMI: Acute Myocardial Infarction; CAD: Coronary Artery Disease; non-CAD: Non-Coronary Artery Disease.

SEX DIFFERENCES

The sex group difference was particularly significant among the male patients where 172 of 239 patients (72%) who had acute myocardial infarction were smokers ($p < 0.02$); 153 of 212 (72.2%) patients who had acute coronary syndromes were smokers ($p = 0.10$). (Fig. 1) Female patients did not show any significant difference in smoking prevalence when compared to those in the non-CAD group (Table 1). However, female AMI and CAD patients who were above 60 years of age had a significantly higher smoking prevalence (Figures 2, 3) than those who did not have coronary disease, ($p < 0.01$). In this survey, there was no difference between heavy smokers or self-acknowledged smokers of less than 20 cigarettes per day.

AGE

The mode age group for men suffering from acute myocardial infarction was 50 to 59 years whereas for women it was 60 years and above. For other acute coronary syndromes however, both modes were 60 years and above (Fig. 2 and 3). For men, particularly those in the younger

age groups, coronary events occurred much more among smokers than non-smokers. For example for men below 50 years, 57 of 64 myocardial infarction patients or 89.1% were smokers (Figure 2). It was noteworthy that those women who had coronary events but, who were below 60 years were principally non-smokers.

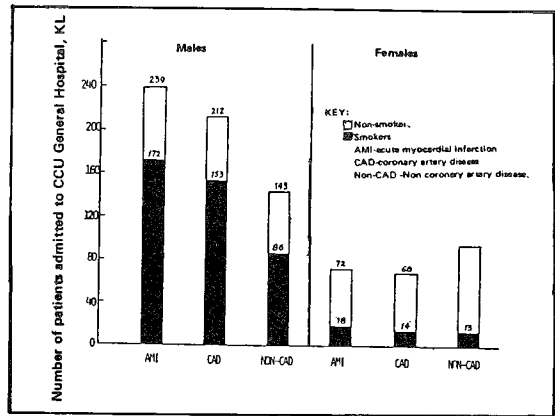


Fig. 1 Smoking among acute myocardial infarction, coronary artery disease and non-coronary patients admitted to the Coronary Care Unit, Kuala Lumpur, Malaysia.

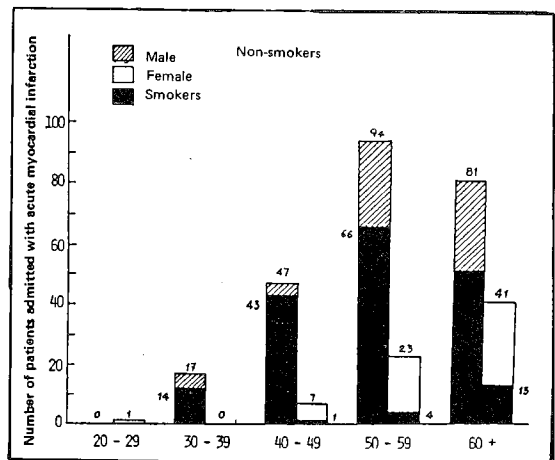


Fig. 2 Title: Age, Smoking and Acute Myocardial Infarction Patients admitted to the CCU, General Hospital, Kuala Lumpur.

ETHNIC DIFFERENCES

Tables 2 and 3 show the distribution of coronary events among the major ethnic groups in Malaysia, as seen in this survey. Although Indians and others form only 10.2% and 0.6% respectively of the population in Peninsular Malaysia, they

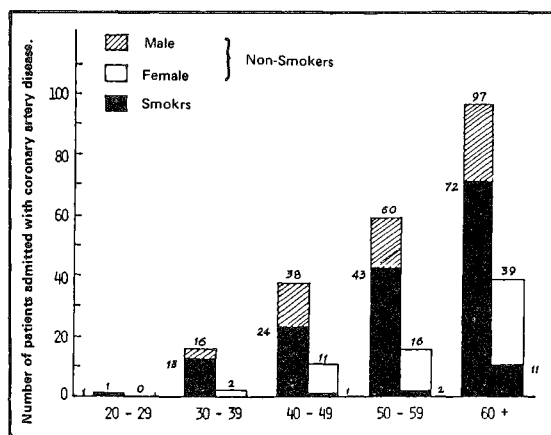


Fig. 3 Age, Smoking and coronary artery disease patients admitted to the Coronary Care Unit, General Hospital, Kuala Lumpur.

TABLE II
ETHNIC GROUP, SEX DISTRIBUTION AND SMOKING PROFILE OF ACUTE MYOCARDIAL INFARCTION IN PATIENTS ADMITTED TO CORONARY CARE UNIT, GENERAL HOSPITAL KUALA LUMPUR (AUGUST 1986 TO JANUARY 1987)

AMI patients	Malays	Indians	Chinese	Others	Total	Deaths
Male:	76	91	61	11	239	48
Smokers	56	65	49	2	172	28
Non-smokers	20	26	12	9	67	20
Heavy smokers	20	24	19	0	63	16
Female:	24	19	24	5	72	20
Smokers	7	2	9	0	18	7
Non-smokers	17	17	15	5	54	13
Heavy smokers	1	0	1	0	2	1
Total	100	110	85	16	311	68

AMI : Acute Myocardial Infarction

TABLE III
ETHNIC GROUP, SEX DISTRIBUTION AND SMOKING PROFILE OF CORONARY ARTERY DISEASE PATIENTS ADMITTED TO CORONARY CARE UNIT, GHKL (AUGUST 1986 TO JANUARY 1987)

CAD patients	Malays	Indians	Chinese	others	Total	Deaths
Male	77	73	56	6	212	7
Smokers	50	54	47	2	153	3
Non-smokers	27	19	9	4	59	4
Heavy smokers	8	17	19	0	44	0
Female:	20	11	35	2	68	1
Smokers	4	2	8	0	14	0
Non-smokers	16	9	27	2	54	1
Heavy smokers	1	0	2	0	3	0
Total	97	84	91	8	280	8

CAD : Coronary Artery Disease.

were over-represented in terms of coronary events in this study. Of the population surveyed, 249 or 30.1% were Indians, of which 110 were diagnosed as acute myocardial infarction patients. Of these 110 Indian patients, 67 were smokers, 65 were males. In the other group of coronary events under CAD, 56 of 84 (or 66.7%) were smokers among the Indians. Others including mainly Sikhs and Eurasians numbered 32 or 3.9% of the coronary population. Here the smoking prevalence was low. The Malays were under-represented in this survey, only 34.9%. Sixty-five of 100 infarct patients were smokers. The Chinese were also found to be slightly under-represented; nevertheless, the smoking prevalence among this ethnic group was particularly strong among the men i.e. 49 of 61 were infarct patients, and 47 of 56 had other coronary syndromes.

MORTALITY

There were 68 deaths from the acute myocardial infarction group 48 of these men. The case fatality was 21.9%. Thirty-five out of these 68 fatalities were smokers (not significant). Heavy smokers (those admitting to smoking more than 20 cigarettes per day) were somewhat over-represented in this fatality group i.e. 17 of 68 or 25% compared with the overall 65 of 311 infarct patients (20.9%). Thus 48 of the 243 non-fatal infarcts were also heavy smokers. But this was not statistically significant. It should be pointed out that the mortality estimated here reflected only early in-hospital deaths within 7 to 10 days of the myocardial infarction. See tables 2 and 3.

OTHERS RISK FACTORS

Serum lipid levels are not considered reliable during the immediate post-infarction period by some authorities.^{12,13} They were determined after the initial acute phase had passed, preferably after four to eight weeks.¹⁴ However, this proved unreliable as laboratory results were often misplaced and thus became notoriously difficult to trace. The lipid profile of the above patients was thus not analysed in this study.

Tables IV and V show the hypertension and diabetes prevalence in the patients admitted to the

coronary care unit, where a firm diagnosis of an acute coronary event was made. In the infarct group, 83 patients were hypertensive, 38 had diabetes alone and 35 had both elevated blood pressure and diabetes. Among these, 88 were also smokers. Of the infarct patients 120 had only smoking as a risk factor, compared with 53 with none (serum lipids were not considered here). This excess infarct incidence in the smoking group was significant ($P < 0.001$), similarly so for the males ($P < 0.02$). Women did not show any excess risk from smoking in this study. Similar results were seen in those patients admitted for CAD. Seventy-two patients had only smoking as a known risk factor ($p < 0.05$).

We were unable to determine if the risk factors were additive or synergistic to the development of coronary events in this study.

TABLE IV
RISK FACTORS AND ACUTE MYOCARDIAL INFARCTION AMONG CORONARY CARE UNIT PATIENTS, GENERAL HOSPITAL KUALA LUMPUR (AUGUST 1986 - JANUARY 1987)

Patients	+ BP	+ DM	+BP + DM	Total	TS	S On Only
Smokers	55	17	16	88	190***	102***
Males	47	14	15	76	172***	96***
Females	8	3	1	12	18ns	6ns
Deaths	7	0	3	10	35ns	25ns

Patients	+ BP	+ DM	+BP + DM	Total	TS	S Only
Non-smokers	28	21	19	68	121	53
Males	16	14	9	39	67	28
Females	12	7	10	29	54	25
Deaths	7	2	3	29	54	21

Patients	+ BP	+ DM	+BP + DM	Total	TS	S Only
Total	83	38	35	156	311	155
Total deaths	14	2	6	22	68	56

*** $p < 0.001$; ** $p < 0.02$; ns : not significant.
S = Smokers; TS = Total Number of smokers; NS = Non-smokers; TNS = Total number of Non-Smokers; BP = Hypertension; DM = Diabetes Mellitus; AMI = Acute Myocardial Infarction.

SMOKING HABITS

Figures 5 and 6 show the smoking habits of smokers admitted to the CCU with confirmed coronary events. The mode habit is 11 to 20 cigarettes per day for more than 10 years. Nevertheless, about one-third smoked more than 20

TABLE V
RISK FACTORS AND CORONARY ARTERY DISEASE AMONG CCU PATIENTS AT GENERAL HOSPITAL KUALA LUMPUR (AUGUST 1986 TO JANUARY 1987)

Patients	+ BP	+ DM	+ BP + DM	Total	TS	S Only
Smokers	55	14	26	95	167***	72*
Males	53	11	20	98	153ns	69ns
Females	2	3	6	11	14ns	3ns

Patients	+ BP	+ DM	+ BP + DM	Total	TNS	NS Only
Nonsmokers	20	11	18	49	113	64
Males	11	4	8	23	59	36
Females	9	7	10	26	54	28

Total	75	25	44	144	280	136
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* $p < 0.05$; *** $p < 0.001$; ns : not significant
S = Smokers; TS = Total Number of smokers; NS = Non-smokers; TNS @ Total number of non-smokers; BP = Hypertension; DM = Diabetes mellitus; CAD = Coronary Artery Disease.

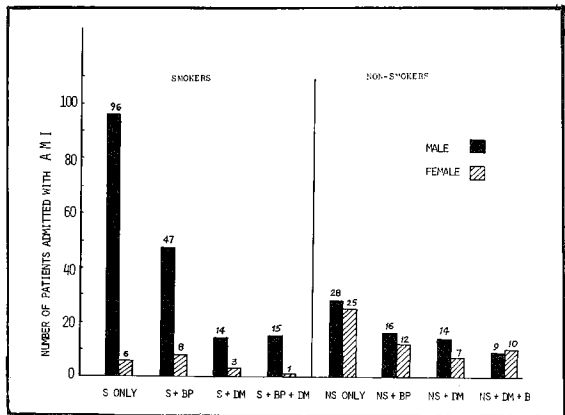


Fig. 4 Smoking, hypertension, diabetes mellitus & sex as risk factors in acute myocardial infarction patients admitted to CCU, General Hospital, KL.

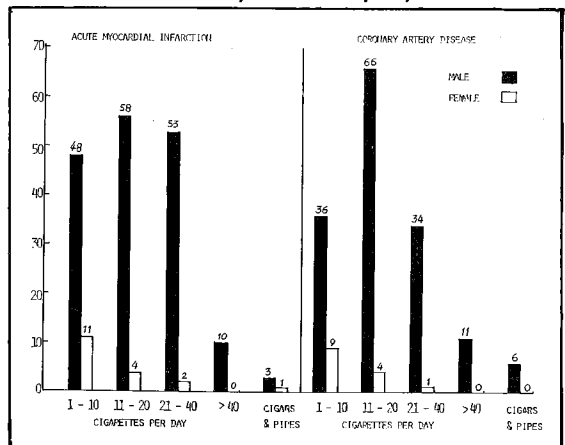


Fig. 5 Daily smoking habits among patients admitted with acute myocardial infarction & coronary artery disease by sex, at CCU, General Hospital, KL.

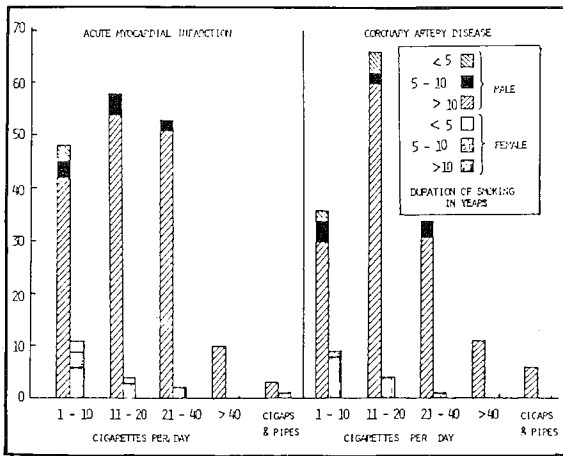


Fig. 6 Smoking profile of sex, number of cigarettes smoked daily, duration of smoking history among acute myocardial infarction and coronary artery disease patients admitted to CCU, GHKL.

cigarettes per day and this may be considered heavy by most. Very few cigar or pipe smokers were identified in this study. Also women tended to smoke fewer cigarettes per day, i.e. 1 to 10 being the mode, although most smoked for more than ten years. About 10 per cent claimed to have quit smoking for variable periods from a few days to a few months. But this was found to be unreliable with many retracting their admission upon questioning. Furthermore, non claimed to have been ex-smokers for more than two years, where the coronary risk is thought to be unity by then.¹⁵ The numbers involved were too small to be reliably analysed.

DISCUSSION

From the above data, it is shown quite convincingly that there were disproportionately more smokers among coronary care unit patients who suffered acute coronary syndromes, than those who were not ($p < 0.001$). Bearing in mind that most patients who warranted admission into the CCU were initially thought to have coronary events, one would expect a biased population, with risk factors other than smoking, being more important. Hypertension, diabetes mellitus, hypercholesterolaemia, should figure prominently in this predisposed population. Instead, we find that cigarette smoking was by far the most prevalent risk factor in our CCU population. Even when

hypertension and diabetes were excluded (Tables 4 & 5), cigarette smoking remained statistically significant as an identifiable risk factor ($p < 0.001$; $p < 0.05$).

It is interesting to note that in a study of young CAD patients, (<40 years), Jeyamalar and others¹⁶ found that among 40 patients, 19 were Indians, 11 Malays and 10 Chinese. Almost all but one were male; 66% were smokers, 21.2% diabetics, 15.1% hypertensives, 12.5% with high cholesterol. These data concurred well with our own. The predominant risk factor was then smoking.

The heart attack rate for male smokers in our sample was 172 of 411 (41.8%) compared with 67 of 183 (36.6%) male non-smokers. The overall heart attack rate for all smokers was 190 of 456 (41.7%) compared with 121 of 372 (32.5%) of non-smokers. This represented some 9.2 excess myocardial infarctions per 100 CCU admissions if the patients were current smokers. The Framingham cohort study¹⁷ showed heart attack risks of 118/1000 and 74/1000 for smokers and non-smokers respectively, where the general population was studied. Clearly our coronary care unit sample was a skewed one where coronary events were concerned. We have no data to date, of the total myocardial infarction incidences in Malaysia, nor the smoking prevalence in the general population.

It is also shown that women in our population studied, had less coronary events than men. This has been well noted in many studies before including for this discrepancy, the most plausible being hormonal protection in the premenopausal women. Certainly, smoking in women below 60 years, did not appear to be an important risk factor in the development of coronary disease. Perhaps, our event rate for women was too small to detect the contributory effect of smoking. In a follow-up Framingham study²¹ Shurtleff also failed to show a relationship between cardiac infarction in women and cigarette smoking. However, in the post-menopausal period this 'cardio-protective effect'¹⁹ seemed to be lost. This corresponded well to the significantly higher prevalence rate of women over 60 years who smoked in the

coronary event subgroup compared with those in the 'non-CAD' subgroup ($p < 0.01$). We are unsure as to the contribution of the post-menopausal hormonal changes or previous use of oral contraceptive pill in this group of patients. We are looking into these aspects at the moment in our women coronary patients.

It is interesting to note that early in-hospital deaths from coronary events among smokers were not significantly greater than non-smokers. However, again our event rate for early mortality was relatively low. It has been shown that sudden cardiac death was certainly more common among smokers.²

Cigarette smoking habits were noted to be associated with increased risk for developing coronary events.² Whilst we were unable to show that heavy smokers were at increased risk to myocardial infarction or acute coronary syndromes, compared to lighter smokers, we have shown that most of these coronary patients had been smoking for more than 10 years. Also, as shown in Figure 2, younger men (< 50 years) who suffered acute myocardial infarction were predominantly smokers ($p < 0.001$). A similar trend was seen among 'CAD' male patients (Figure 3). This has also been shown by Kannel and Castelli.²

The epidemiological pattern of acute myocardial infarction in the General Hospital Kuala Lumpur has been reported variously by Goh and Ng,^{2,2} Ng,^{2,3} Ng et al^{2,4} and Pillay et al^{2,5}. The AMI profile for urban Malays was reported by Ridzuan Bakar and others.^{2,6} However, the smoking profile of these coronary patients was not comprehensively studied. We have shown that even among the various ethnic groups cigarette smoking formed the predominant associated and probably the main contributory risk factor in the development of coronary artery disease and acute myocardial infarction in particular. This study demonstrates the unequivocal significance of cigarette smoking as a sole independent coronary risk factor as well as being a contributory factor to others e.g. hypertension and diabetes.

The importance of establishing the role played by cigarette smoking in Malaysia coronary heart disease lies in its usefulness in helping to prevent the disease. In Malaysia there can be little doubt that coronary artery disease is predisposed to by smoking; it is certainly the most prevalent risk factor for our patients admitted to the coronary care unit for some coronary event. Bearing in mind that some one-fifth to one-half of our population are self-confessed current smokers,⁶ the population at risk is certainly awesome. We have to re-educate our public that they are better off without that puff. Discontinuation of smoking must be encouraged for it has been shown that it would reduce their risk of coronary disease.^{2,7,2,8} Even when they have sustained an event i.e. myocardial infarction, they would still fare better when they quit smoking.^{1,5,2,9} Rosenberg et al^{1,5} had suggested that encouragement to quit smoking might be reinforced when the patient had concomitant risk factors e.g. hypertension. Their report suggested that after two-years of sustained abstinence from smoking, the relative risk estimate approached unity.

Smoking appears to accelerate the atherosclerotic process.^{3,0,3,1} Reports are emerging that suggest that the risk of myocardial infarction smoking on the risk of myocardial infarction is in the main rapidly reversible. Other mechanisms than atherosclerosis may be important in determining morbidity and death in the smoker. Acute but reversible changes in platelet adhesiveness and survival, coagulation factors, carboxyhaemoglobin levels and myocardial irritability may be greatly influenced by smoking.^{3,0} As the U.S. surgeon-general's new warning goes, "Quitting smoking now greatly reduces serious risk to your health."

Unfortunately we are unable in this study to analyse the role of lipids in our coronary patients, because of logistical problems. This is not to undermine the importance of hyperlipidaemia as an important risk factor predisposing to coronary artery disease. We hope to be able to study this risk factor in our future patients. Occupation, social class, physical activity, obesity, strong family history of CAD and type-A

personality were also not studied. We believe these factors play a minor role in our patients where predisposing factors overlap and prove difficult to separate and analyse. We believe cigarette smoking represented the most important preventable coronary risk factor for our population.

Acute coronary syndromes and coronary artery disease in general, are increasingly important causes of death in Malaysia.³ In our study of patients admitted to the coronary care unit in General Hospital Kuala Lumpur, we have found that smoking was the most prevalent and significant risk factor in those who had confirmed acute myocardial infarction or acute non-infarct coronary syndromes ($p < 0.001$). This was most significant among the male population especially younger men who smoked heavily for more than 10 years. Because of our small event rate among the female patients, smoking did not appear to be an important risk factor for those below 60 years. However, women above 60 years who had coronary events were shown to have a significantly higher prevalence of smokers. Men in the various ethnic groups showed similar smoking patterns. Malaysian Indians were shown to be over-represented in the coronary population compared to the other races.

Cigarette smoking is the predominant preventable risk factor for coronary heart disease in a typical Malaysian coronary care unit. Therefore, it behooves the medical community to convince and to convey to the Malaysian public the very real and serious consequences of smoking. With the onslaught of increasingly subtle and glamorous persuasions of clever but devious tobacco advertising, we can only hope that the higher authorities accept the challenge to expose the curtain of sham and misconception the tobacco industry had pulled over the public's eyes. Tobacco and smoking are not synonymous with sports and the 'good life'. Smoking certainly predisposes to coronary events especially among the younger age group, even in Malaysia.

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