

ORIGINAL ARTICLE

The Prevalence Of Type II Diabetes Mellitus And Its Cardiovascular Risk Factors In A General Practice

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Introduction

Diabetic patients suffer from increased morbidity and mortality due to macrovascular and microvascular complications¹⁻⁴. Although hyperglycaemia is the primary metabolic abnormality of diabetes, the association between hyperglycaemia and macrovascular diseases is not fully established, in contrast to the largely substantiated association between hyperglycaemia and microvascular diseases⁵. On the other hand, the commonly identified risk factors for macrovascular diseases e.g. hypertension, lipid abnormalities and smoking appear to have an additive adverse effect in diabetic patients. However cross-population studies suggest that not all diabetic patients are subject to the same increase in cardiovascular risk^{5,6}.

Studies on cardiovascular diseases in diabetics have been conducted in specialist clinics in Hong Kong⁷. However, patients who attend specialist clinics may not be representative of the Hong Kong diabetic population. They may have more serious diabetic complications, multiple risk factors and a disproportionately large number of Type I diabetic patients despite the fact that Type I diabetes is a very uncommon condition in Hong Kong. In the present report, we therefore aim to assess the prevalence of Type II diabetes and its cardiovascular risk factors in Chinese patients attending a community-based general practice in Hong Kong.

Summary

The aim of this study was to assess the prevalence of Type II diabetes and its cardiovascular risk factors. It was conducted on patients attending the General Practice Unit of the University of Hong Kong. In a total patient population of 3,400, 182 were identified to have diabetes mellitus (both Type I & II). All but one of the 182 diabetic patients had Type II diabetes. The mean age of these Type II patients was 63.4 and mean duration of known diabetes was 3.5 years. Sixty-two percent were on oral hypoglycaemic agents and 32.6% were on diet only. Over half were either on treatment for hypertension or had blood pressures in the hypertensive range. Seventy percent with measured cholesterol had levels above 5.2 mmol/l while 36% with measured triglyceride had levels above 2 mmol/l. Nearly 10% were smokers, with men being 12 times more likely than women to be smoking. Over two thirds had BMI over 25. This study reveals a high prevalence of major cardiovascular risk factors among Chinese Type II patients attending a Hong Kong general practice clinic. Long term prospective studies are needed to determine if these risk factors have similar cardiovascular effects in Hong Kong Chinese population as in the Western populations.

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Subjects and Method

The study was conducted at the General Practice Unit of the University of Hong Kong at Ap Lei Chau. Over 95% of the patient population are local residents of Ap Lei Chau and many of these are fishermen or descendants of fishermen. The clinic has been operating since early September 1992. It had just over 3,400 patients on its list by September 1, 1993. Two full-time and three part-time general practitioners work in the practice which also uses a computerized medical record system.

Patients with the diagnosis of diabetes mellitus (including both Type I & II) were identified from the computer record on September 1, 1993. All the records of these patients were then reviewed. Information on the major known cardiovascular risk factors including blood pressure, lipids (total cholesterol and triglyceride), smoking and Body Mass Index (BMI) were recorded on a prescribed form. Demographic data, duration of diabetes and methods of treatment were also recorded. The

data was then analyzed by using the SPSS. PC programme.

Results

Of the 3,400 patients, 182 were listed with the diagnosis of diabetes mellitus. Only one 17-year-old woman had Type I diabetes and she was excluded from further analysis. There were 1,945 patients who were over 30 years of age and all Type II diabetic patients were over 30. The prevalence of Type II diabetes among all patients was therefore 5.3% (181/3,400).

The prevalence of Type II diabetes by age is shown in Figure 1 and was fairly constant between the ages of 50-90 at 14-17%. Eighty-seven percent of the patients were over 50 years of age with 5% between 30-40.

The mean age of the patients was 63.4 and the mean duration of known diabetes was 3.5 years. The range of duration varied from newly diagnosed to a maximum of 20 years.

Figure 1: Prevalence of NIDDM by Age

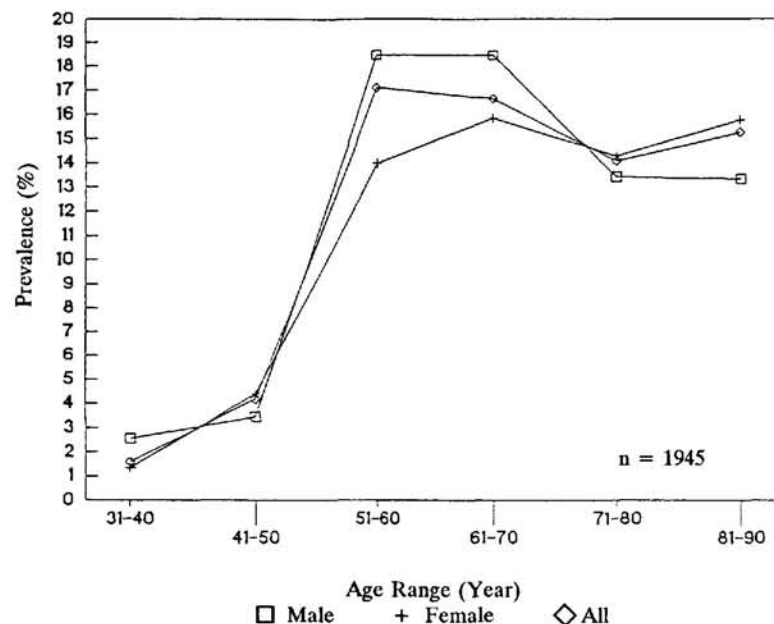


Table 1 shows the frequency distribution of methods of treatment. Over 60% of the patients were on oral hypoglycaemic agents. Very few patients were on insulin.

Table 1: Frequency Distribution of Methods of Treatment

	Men (%)	Women (%)	All (%)
Diet Only	21 (39.6)	38 (29.7)	59 (32.6)
Oral Hypoglycemic Agents (OHA) Only	28 (52.8)	84 (65.6)	112 (61.9)
Insulin Only	2 (3.8)	2 (1.6)	4 (2.2)
Insulin + OHA	1 (1.9)	2 (1.6)	3 (1.7)
Unknown	1 (1.9)	2 (1.6)	3 (1.7)
Total	53	128	181

WHO criteria for hypertension (defined as systolic pressure over 160 or diastolic pressure over 95 or on treatment for hypertension) was adopted for this study. Fifty-four percent of men and 47.7% of women were on treatment for hypertension. Four percent of men and 7.8% of women also had blood pressures of the hypertensive range but were not on anti-hypertensive medication.

Table 2 shows the major lipid levels. Total cholesterol and triglyceride levels were measured in most patients. Only 31% of patients with measured cholesterol had levels below 5.2 mmol/l and 19.7% had levels above 6.5 mmol/l. Sixty-four percent of patients with measured triglyceride had levels below 2 mmol/l and 5.4% had levels above 5 mmol/l.

Table 2: Mean Cholesterol and Triglyceride Levels

	Men (S.D.)	Women (S.D.)	All (S.D.)
Mean Total Cholesterol, mmol/l	5.78 (1.17) n = 42	5.75 (1.68) n = 100	5.76 (1.54) n = 142
Mean Triglyceride, mmol/l	2.29 (1.16) n = 32	2.85 (4.51) n = 79	2.69 (3.85) n = 111

Table 3 shows the prevalence of smoking. Men were far more likely to be smokers. Most women had never smoked.

Table 3: Prevalence of Smoking

	Men (%)	Women (%)	All (%)
Smokers	15 (28.3)	3 (2.3)	18 (9.9)
Ex-smokers	16 (30.2)	10 (7.8)	26 (14.4)
Never Smoked	22 (41.5)	108 (84.4)	130 (71.8)
Unknown	0	7 (5.5)	7 (3.9)
Total	53	128	181

Table 4 shows the BMI distribution. 67.8% of men and 67.2% of women had BMI over 25. The mean BMI of 172 Type II diabetic patients and 1616 over-30 non-diabetic patients in the practice were 26.75 (S.D. = 4.39) and 24.9 (S.D. = 4.23) respectively. (p value < 0.0001, student t-test).

Table 4: BMI Distribution and Mean BMI

BMI	Men (%)	Women (%)	All (%)
< 25	14 (26.4)	36 (28.1)	50 (27.6)
25 - 30	25 (47.2)	60 (46.9)	83 (45.9)
> 30	11 (20.6)	26 (20.3)	39 (21.5)
Unknown	3 (5.7)	6 (4.7)	9 (5.0)
Total	53	128	181

Discussion

In our study, the prevalence of Type II diabetes was very high. Out of a total patient population of 3,400, 181 (5.32%) were diagnosed with the condition.

Does this reflect the prevalence of Type II diabetes in the Hong Kong Chinese community?

Prevalence of Type II Diabetes Mellitus and its Cardiovascular Risk Factors

Unfortunately, there is no answer to that. An estimated prevalence of diabetes mellitus of just under 1% was made in 1984⁸ while Cockram *et al* reported prevalence of 5.1% and 3.6% in men and women of working age respectively in 1993⁹. It is possible that our practice may have a higher than average number of Type II diabetic patients. A major reason is that our practice is a heavily-subsidized government clinic, we therefore tend to attract patients with chronic illnesses. Our study is also restricted by its small sample size to allow any major generalization. However, it is likely that our patient sample is representative of other government general out-patient clinics. On the other hand, the fact that most of the general practitioners in Hong Kong are in solo private practice and most patients doctor-shop makes a large scale assessment very difficult. Despite these difficulties, further studies are needed to assess the true prevalence of Type II diabetes in Hong Kong.

As expected, most of our Type II diabetic patients were over the age of 50. Nonetheless, 13% of them were under 50 and 5% were under 40 years of age. This corresponds with the trend that some Type II diabetic patients are being diagnosed at earlier ages in areas undergoing significant lifestyle changes⁶.

Most of our patients were receiving oral hypoglycaemic agents (OHA) to help control their hyperglycaemia. Very few of our patients were receiving insulin compared to other studies⁷. One possible explanation is that they have not yet developed the secondary failures of OHA because of their relative short duration of disease, averaging only about 3.5 years.

We have chosen to study hypertension, lipids, smoking and obesity because they are regarded to be the major cardiovascular risk factors by most authorities^{5,6}. On the other hand, hyperglycaemia is not included because it is not an established risk factor for macro-vascular complications which provide most of the cardiovascular morbidities and mortalities⁵.

The prevalence of hypertension was very high among our Type II diabetic patients^{7,10-13}. Fifty-eight percent of men and 55.5% of women had hypertension by WHO criteria. In the WHO Multinational Study, the highest percentage for male diabetic patients with hypertension was 39.4% in Moscow whereas for female diabetics was 48.9% in Zagreb⁷. The same study also showed 27.8% of men and 30.8% of women in Hong Kong specialist diabetic clinics had hypertension. The high prevalence of hypertension in this study may be a reflection of the relative old age of the group. On the other hand, hypertension may indeed be more common among our local Chinese patients than previously estimated. Whatever the reason, it is essential to check the blood pressure of all diabetic patients regularly.

Both the total cholesterol and triglyceride were high among our patients. The mean total cholesterol level was similar to other reported studies but the mean triglyceride level was higher in our study^{7,14,15}. Furthermore, our female patients had a mean of 2.85 mmol/l while the male patients had a mean of 2.29 mmol/l. It is now generally accepted that triglyceride is a distinct cardiovascular risk factor for diabetic patients. This may put our female patients at additional risk of cardiovascular complications.

The prevalence of smoking was reported to be 17% in 1986 in Hong Kong¹⁶. Our diabetic patients had a lower overall smoking rate. However, there were more women than men in the group which may explain the apparently lower smoking prevalence among all patients since most women did not smoke. The prevalence of smoking among our male patients was in fact similar to non-diabetic men even though they generally attend their doctors far more regularly than non-diabetics. This raises the issue of whether doctors have been doing enough to identify and help their patients quit smoking.

Excessive weight is not only a causal factor for developing Type II diabetes but is also a risk

factor for cardiovascular diseases in Type II diabetic patients^{5,6}. Most of our patients had BMI above the desirable range of 20-25. Weight reduction is not easy. However, it is particularly worth the doctor's effort to help Type II diabetic patients lose weight as it helps reduce cardiovascular risk as well as improve glycaemic control.

A small number of patients did not have their smoking status, blood pressure and/or BMI recorded. One reason was that some of these patients only attended once or twice and did not return for further follow-ups. We therefore did not have enough opportunities to screen for all the relevant cardiovascular risk factors. Other patients did not have their BMI calculated because they were wheel-chair bound. Some demented patients also could not give any information on their smoking status.

Conclusion

The prevalence of Type II diabetes is high among our patient population. Hypertension was extremely common among these patients with nearly 50% of them on anti-hypertensive drugs. Also, most of them had unsatisfactory lipid levels and BMI. The prevalence of smoking among diabetic men was no better than their non-diabetic counterparts despite the fact that diabetic patients generally have more contacts with their doctors. This data will be a good basis for a long term prospective study to assess if these cardiovascular risk factors have the same adverse effects on cardiovascular diseases in the Hong Kong Chinese Type II diabetic patients as in the Western populations.

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