# Characteristics of Diabetic Retinopathy Patients at Initial Presentation

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## Summary

The aim of this retrospective study was to characterise a population of patients presenting for the first time with the diagnosis of diabetic retinopathy at the University Hospital Ophthalmology Unit, Kuala Lumpur. The mean age was 54.2 years and 58.9% of patients had severe disease during first presentation at this tertiary referral unit. Ethnic Indians had the highest rate of severe disease. The mean duration of diabetes was 12.3 years and correlated with severity of retinopathy. 87.8% of patients had NIDDM. Pensioners and non-income earners comprised 57.8% of the study population.

*Key Words:* Diabetes mellitus, Diabetic retinopathy

## Introduction

Diabetic retinopathy is an important public health problem. It is the major cause of blindness in diabetes and the leading cause of legal blindness among adults of occupational age[1] in many developed countries. Early detection and intervention using photocoagulation techniques can effectively arrest and prevent severe impairment[2,3]. This is especially significant since proliferative retinopathy can be present before deterioration in visual acuity occurs. It has been estimated that the risk of blindness due to this disease can be reduced by 73% with prompt and appropriate treatment[4]. Hence, it is of value to attempt to characterise those diabetic persons in need of ophthalmic examination, follow-up and subsequent management.

The University Hospital, Kuala Lumpur, provides health care primarily to residents centred around Kuala Lumpur and Petaling Jaya. Functioning as a tertiary referral centre, it also receives a number of district and interstate referred patients. In this study, an attempt is made to characterize the demographic makeup of the patients that presented for the first time at the UH Eye Clinic with the diagnosis of diabetic retinopathy. It is hoped that this information will be of value in the future planning and administration of eye health care to this specific population.

## Methods and Materials

All patients presenting with diabetic retinopathy for the first time at the University Hospital Ophthalmology Clinic over a three-year-period, January 1989 to December 1991 inclusive, were considered for this study. New patients were identified from clinic records of first time presentations, which included diagnoses and relevant demographic data. Detailed information was then collected from the hospital's patient records.

A standard form was used for gathering data from hospital records in this retrospective study. Information noted included personal data like current age, sex, race, town of residence and occupation; as well as severity of retinopathy, mode of treatment and duration of diabetes at the time presentation. Duration of diabetes is that time period between age at presentation and age at diagnosis. Patients diagnosed as non-insulin dependent

diabetics (NIDDM) were differentiated from those who were insulin-dependent (IDDM).

Severity of diabetic retinopathy was classified according to the following categories:-

1. **Background retinopathy only.** This was characterised by the presence of microaneurysms, hard exudates and "dot" and "blot" haemorrhages.

2. **Background retinopathy with maculopathy.** Findings here included focal, cystoid and ischaemic diabetic maculo-pathy.

3. **Preproliferative retinopathy.** Features of this were cotton-wool spots, intra-retinal microvascular abnormalities, venous loops and large intra-retinal haemorrhages.

4. **Proliferative retinopathy and advanced diabetic eye disease.** This was defined as the presence of neovascularization at the disc or elsewhere on the retina, vitreous haemorrhage, tractional retinal detachment or rubeosis iridis.

## Results

Of a total 119 cases presenting with the diagnosis of diabetic retinopathy at the Clinic, case notes for 90 (75.6%) were available for analysis. This represented approximately 1% of new patients attending the University Hospital Ophthalmology Clinic. Of the 90, the overwhelming majority were taking oral hypoglycaemic agents (70 patients (77.8%)); while 17 (18.9%) were on insulin and 3 (3.3%) on diet alone. 79 (87.8%) patients were non-insulin dependent diabetics [Table I].

### Age, Sex and Ethnicity

The mean age at presentation was 54.2 years, with an age range of 18 to 80 years. Females were slightly older at presentation with a mean age of 56.0 years, as compared to males who had a mean age of 52.6 years. 91.1% (82) of patients were aged between 40 and 69 years. The mean ages at presentation among the main ethnic groups were as follows:- [Table I]

Chinese   -   53.3 years
Malay     -   55.1 years
Indian    -   54.1 years

### Table I
### Age at presentation for IDD's and NIDD's

| Age (years) | IDD (%) | NIDD (%) |
|---|---|---|
| less than 20 | 1 (1.1) | 0 (0.0) |
| 20-29 | 2 (2.2) | 0 (0.0) |
| 30-39 | 3 (3.3) | 0 (0.0) |
| 40-49 | 3 (3.3) | 17 (21.5) |
| 50-59 | 1 (1.1) | 29 (23.3) |
| 60-69 | 1 (1.1) | 31 (31.1) |
| 70-79 | 0 (0.0) | 1 (1.1) |
| 80+ | 0 (0.0) | 1 (1.1) |
| Total | 11 (12.2) | 79 (87.8) |
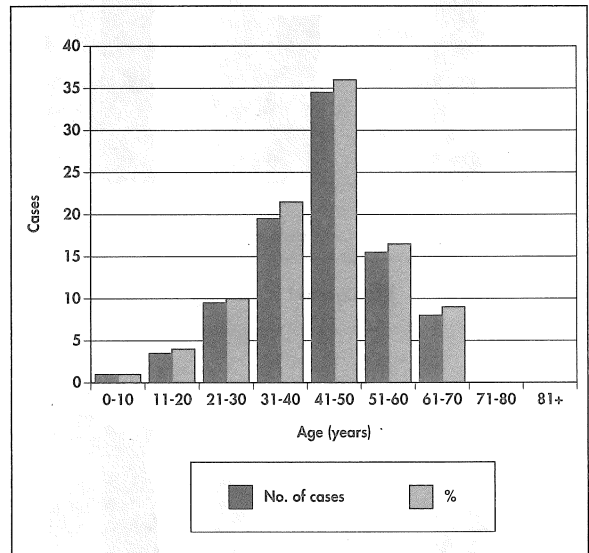


Fig. 1:   Age of diagnosis of Diabetes Mellitus

The mean age at diagnosis of diabetes mellitus was 39.6 years, with a range of 10 to 65 years. Of this, 85.6% of the cases were diagnosed after the age of 30; this group had a mean age at diagnosis of 47.4 years. 95.6% of cases were diagnosed between the ages of 21 and 70 years (Fig. 1). Among the ethnic groups, Malays had a mean age at diagnosis that was earlier (36.7 years) than that of the mean of 39.6 years for the study population. This was later for Indians and Chinese at 41.6 and 44.7 years respectively.

The study population comprised of 50 females and 40 males, males being outnumbered by 11.1%. Its ethnic composition was as follows:-

Malay       -   30 (33.3%)
Chinese     -   39 (43.3%)
Indian      -   21 (23.3%)

The sex distribution amongst the ethnic groups, as compared with that of University Hospital's ophthalmology outpatients[5], is shown in Figure 2.
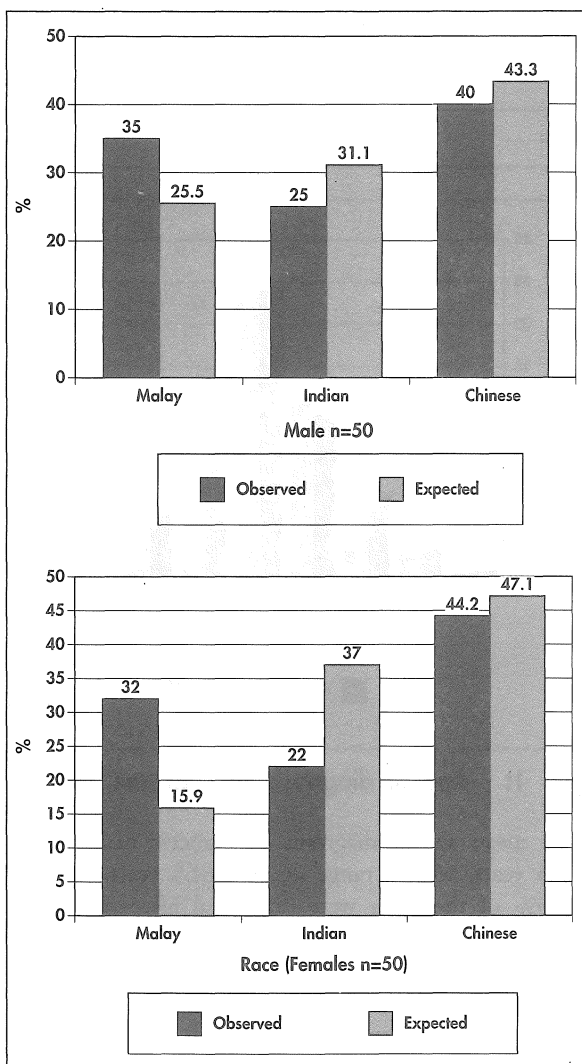


Fig. 2:   Sex distribution among ethnic groups as compared to UH eye outpatients

While results observed approximated that which was expected in the Chinese, they were higher in Malays and lower in Indians (for both sexes); that is, the proportion of Indians presenting at the Clinic with this condition was proportionately lower as compared to general eye clinic patients.

### Severity of Retinopathy

53 (58.9%) patients were classified as suffering from maculopathy, preproliferative or proliferative retinopathy, at first presentation at the Clinic. Of this, 16 (30.2%) had maculopathy and 20 (37.7%) proliferative disease (32.1%). Indians had the highest rate of serious eye disease (66.7%) while Chinese had the lowest (56.4%) [Table II].

The mean duration of diabetes was 12.3 years, with a range of 1 to 36 years. There appeared to be a correlation between duration of diabetes and severity of retinopathy. 71.4% of patients with a diagnosis of NIDDM of over 20 years' duration had vision-threatening retinopathy as compared with 45.5% in those diagnosed 2-4 years prior to presentation [Table 3]. Of the 90 patients, 17 (18.9%) presented with vitreous haemorrhages. 6 patients required vitrectomy.

### Occupation

The most frequently found occupations within this population of patients were:-

1.  Housewives          31 (34.4%)
2.  Unemployed          14 (15.6%) and
3.  Retirees/Pensioners  7 (7.8%)

Together, this group comprised 57.8% of the study population. This finding may be inaccurate since falsifying occupational information can result in free treatment.
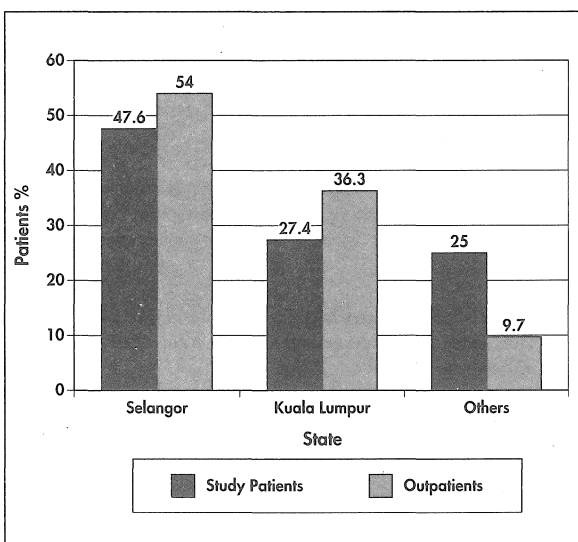
### Geographical Distribution

The distribution of patients travelling interstate (non-Kuala Lumpur, non-Selangor) was higher than that calculated from the University Hospital's ophthalmological outpatients statistics[5]. They came from Negeri Sembilan (42.9%), Melaka, Johor, Perak and Pahang. This demonstrates the importance of the unit as an interstate referral centre (Fig. 3).

Table II
Distribution of retinopathy in the 3 main ethnic groups

| Race | Background only (%) | Maculopathy | Preproliferative | Proliferative |
|---|---|---|---|---|
| Chinese | 17/39(43.6) | 5/39 (12.8) | 7/39 (17.9) | 10/39 (25.6) |
| Malay | 12/30(40.0) | 5/30 (16.7) | 7/30 (23.3) | 6/30 (20.0) |
| Indian | 7/21(33.3) | 6/21 (28.6) | 4/21 (19.0) | 4/21 (19.0) |

Table III
Eyes demonstrating Vision Threatening (VT) retinopathy by duration of diabetes

| Years diabetic | IDDM | | | NIDDM | | |
|---|---|---|---|---|---|---|
| | Background | VT | %VT | Background | VT | %VT |
| less than 2 | 0 | 0 | 0 | 5 | 4 | 44.4 |
| 2-4 | 0 | 0 | 0 | 6 | 5 | 45.5 |
| 5-9 | 2 | 0 | 0 | 6 | 8 | 57.1 |
| 10-14 | 1 | 2 | 66.7 | 9 | 14 | 60.9 |
| 5-19 | 0 | 2 | 100 | 4 | 5 | 55.6 |
| 20+ | 0 | 3 | 100 | 4 | 10 | 71.4 |
| Total | 3 | 7 | 70 | 34 | 46 | 57.4 |



Fig. 3: Geographical distribution of patients as compared to UH eye outpatients

## Discussion

The prevalence of vision-threatening disease was considerably higher (58.9%) in this study population with diabetic retinopathy at the Eye Clinic as compared with previous studies carried out on diabetic clinic cohorts[6,7,8]. Teoh et al showed that, of patients with ophthalmoscopically detectable retinopathy attending the University Hospital's Diabetic Clinic, 25% had vision-threatening disease[6]. Another review of 1,000 consecutive diabetic patients attending a diabetic clinic found that, of 26.7% of patients shown to have retinopathy, only 9.5% suffered from serious disease (as defined in this study)[7]. This difference is likely to be due to the tertiary referral nature of the Eye Unit, where some amount of selective bias for more severe diabetic retinopathy has occurred. 87.8% of all patients had NIDDM. There was a correlation between severity of retinopathy and duration of diabetes in this group. Other studies demonstrate similar findings[8].

The study population, however, only represented approximately 1% of total ophthalmological outpatients. With a bulk of clinic patients here being seen for conditions quite readily managed by primary health care providers, like acute conjunctivitis and refractory errors (as noted in clinic attendance book), it is questionable whether the relatively scarce, more specialized skills available in this department are being employed to their optimum.

There appears to be significant differences in the presentation of this disease among the three main ethnic groups. Given that diabetes has its highest incidence among Indians, their expected rate of presentation at the Clinic with this ocular complication was relatively low. Mustaffa, B.E. showed that the prevalence of diabetes in the Malaysian population was highest among Indian males (3.8%) followed by Indian females (3.1%). That for the Chinese and Malays were males 1.0%, females 1.8% and males 1.6%, females 1.3% respectively[9]. Similar significant findings have been demonstrated by other studies[10]. The reasons why less male and female Indians than expected might present with diabetic retinopathy at the Clinic are probably many and complex. Not ignoring possible

biological factors, variables include differences in socioeconomic status, level of education, success in achieving glycaemic control, access to medical services and geographical isolation. However, Indians had the highest rate of serious eye disease at presentation while Chinese had the lowest. Proportionately, more Indians and Malays tended to present at a more advanced stage of disease than did the Chinese.

Female attendance at the Clinic for diabetic retinopathy was higher than that of males; the majority of whom were housewives. In fact, with over 50% of the patients being either pensioners or non-income earners, the unit is an important hub for diabetic eye care among those in the low income bracket. Furthermore, with over 20% of its diabetic retinopathy patient population consisting of interstate referrals, the maintenance and expansion of such a unit to meet the ocular needs of diabetes cannot be overemphasized.

## Acknowledgement

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