

Abstract

Diabetes mellitus is an emerging health problem in Sri Lanka. The objectives of the present study were to determine the long-term complications in type 2 diabetes and some selected risk factors among patients attending diabetic clinics in the Western Province of Sri Lanka and to compare use of direct ophthalmoscopy and retinal photography in the detection of diabetic retinopathy.

This is an unmatched, clinic-based, case control study. Seven hundred diabetics were enrolled for the study from selected primary, secondary and tertiary level medical institutions. Of these selectees, 80% participated in the study; 252 cases and 288 controls. Selection of the clinic centres was done by using a simple random sampling technique. Cases and controls were selected using consecutive method of sampling technique. Detailed histories, clinical examination and laboratory investigations were carried out on the respondents to determine their disease status and possible risk factors. Strict standardization of methodology was ensured throughout the study. Edited data was analysed using the statistical packages SPSS and EGRET. Odds ratio estimates for

the risk factors were computed. Multivariate analysis was used as an attempt to elucidate important independent risk factors.

The study findings revealed that among the patients with type 2 DM attending clinics 20% had diabetic retinopathy, 25.2% diabetic neuropathy, 22.8% microalbuminuria and 12.4% coronary heart disease.

Socio-demographic factors found to be significantly associated with long-term complications were age group between 40-60 years, lower level of education (below grade V) and low monthly family income (less than Rs.2500). The first two characteristics were highly significant even in the final best model ($p < 0.01$). The study also showed that, male, divorced persons, Muslims, people living in semi urban areas, and labourers had higher risk of complications. The other significant person related characteristics were lack of knowledge of diabetic complications, patients' dissatisfaction towards health care given at the clinic, poor clinic attendance, needs of another person's help to attend the clinic and smoking. Of these risk factors, smoking was highly significant $P < 0.001$. Of the patients who were satisfied with the care received, 38.7% stated that they were satisfied with availability of drugs at the clinics.

Among those who were not satisfied, time delays (30.1%), non-availability of drugs (26.8%) and inadequate laboratory facilities (16.6%) were the leading causes for their dissatisfaction. The present study did not identify any significant association of complications with diet, distance travel, the consumption of alcohol, contraceptive practices, use of private sector and genetic predisposition in developing long-term complications in type 2 DM.

The duration (11-20 years) of DM itself had a two-fold increased risk of developing complications. Lack of glycaemic control was an essentially important risk factor for long-term complications. Present study found that 200-300 mg/dl and over 300 mg/dl random blood sugar had nearly four and three fold increased risks respectively. In the univariate analysis this was significant at $P < 0.005$ and in the final logistic regression model this was $P < 0.05$. Diastolic blood pressure ($P < 0.05$) was a significant risk factor in the univariate analysis. BMI > 25 was identified as a significant risk factor in the final logistic regression model ($P < 0.05$).

The overall provision of health care at diabetic clinics was inadequate. This was significant at primary level medical institutions. Availability of equipment and

laboratory facilities varied at different levels of medical institutions. Basic clinical examination and laboratory investigations such as measuring blood pressure, testing urine for sugar were not carried out in certain clinics. Clinic records indicated that patients with reduced frequency of measuring blood pressure and testing blood sugar and urine sugar records had significant association with developing long-term complications.

Randomly selected 176 diabetics screened by two methods; direct ophthalmoscopy and retinal photography for diabetic retinopathy revealed that case detection rates is statistically not significant between these two methods. Direct ophthalmoscopy was examined as having DR of 4% higher than retinal photography.

The findings suggest that long-term complications in type 2 diabetes are important health problems among patients attending state sector clinics in the Western Province of Sri Lanka. The existing provisions of health care at the diabetic clinics are below the expected level of Ministry of Health standards. Widespread coverage of basic investigation facilities and centres of excellence with advanced techniques for diagnosis of long-term complications should be established. Hand in hand with a disease oriented

programme to prevent diabetes and its complications, it is also important to implement 'risk factors' oriented preventive programmes. Further studies are needed in the field of epidemiology of long-term complications of diabetes.