

Prevalence of Diabetes in Sri Lanka

M. A. Wijesuriya

INTRODUCTION

Sri Lanka, is an island nation in the India Ocean with a multi-ethnic and multi-religious population in excess of 18 million people. It has a rural urban mix, which is rapidly changing with a bias towards the latter. The urban sector is around 25%. In addition to this life style change, we have other problems producing a serious impact on the prevalence of diabetes in the country namely:-

- a) a large sector of working population temporarily employed as migrant workers in the more affluent parts of the world.
- b) An ongoing civil war affecting the lives of the entire population to different degrees.
- c) A state of undernutrition in mother and child, giving rise to the following statistics:-
 - 1) 20% of new born children being less than 2.2 kg (full term).
 - 2) A study of children between 3 – 60 months[1], showed the following dramatic results:-
 - a) 20% were stunted,
 - b) 33% underweight
 - c) 16% wasted

All these figures are grossly in excess of what should be in a well nourished population.

- d) Changing age structure with a greater percentage of senior citizens in the community.

MATERIAL AND METHODS

We hereby present a pattern of prevalence as obtained by the study of randomly selected individuals in the adult population spanning from the rural to urban sector over a decade. These have been obtained from four major studies according to WHO criteria using standardised methodology, which were highly reliable.

The rural sample was obtained in 1987-88 by Mahen Wijesuriya et al[2] in a population based in central part of the country sampling 1438 persons randomly selected. There were 582 males and 856 females. This grouping was obtained from nearly 500 homes chosen at random from 1500 homes. All persons over 12 years in these homes were studied

with an acceptance rate of over 90%. The salient features in the above study are as follows:-

1. Low socio-economic background with a high degree of manual labour and basic lifestyle with hardly any modern domestic of transport conveniences.
 2. Obesity almost completely absent in normal, IGT or NIDDM patients being present in 2.03% in normal persons, 3.85% in IGT and 3.75% in those with NIDDM.
 3. No diabetes of the IDDM variety was detected.
 4. No persons were detected with diabetes under the age of 40 years.
 5. The figures for NIDDM were 2.01% for the whole population with equal male to female ratio.
 6. Maximum prevalence in over 60 year age group of 3.41% of males and 3.98% of females with a total of 7.39%.
 7. IGT or impaired glucose tolerance was prevalent in 4.86% out of which the males were 2.01% and females were 2.85%. But the important observation was that it spread across the entire age span. What should be noted is that is was significantly present among the under 40 age group where true diabetes was not detected right down to the lowest age group studied namely 12 - 20 years.
 8. Family history of diabetes was significantly high in the diabetic group, being present in 17.86% as opposed to 5.13% in IGT group and 4.43% in the normal group.
 9. 50% persons diagnosed as diabetics were unaware of their illness prior to the survey.
- The second significant study was conducted in a suburban Sri Lankan community in 1993 by D J S Fernando et al[3].
1. Six hundred and thirty three persons of age 30 - 64 years randomly selected by an electoral register were studied using WHO criteria. There were 312 Males and 321 females.

2. The prevalence of NIDDM was found to be 5.02% (95% CI 3.59-6.43).
3. Impaired glucose tolerance was found in 5.27% (95% CI 3.74-6.78).
4. A total of 21% did not know they had diabetes before the survey.
5. Obesity was common, being present in 21% compared to 10.5% of normal persons.
6. Socio-economic standards were higher than the first survey.

The third and the most recent survey carried out in a rural and urban mixed population in 1994/95 by S Samarage[4] presents the following picture.

1. Those who entered the survey numbered 1480. Compliance rate 82%. 1054 females and 426 males. Mean age 44.7
2. Age range 25-74.
3. Age standardised prevalence of diabetes was 8.1% in the total group.
4. Males were 9.4% and females 7.2%.
5. Maximum prevalence was in the 55-64 group (18.6%).
6. IGT total was 12.9%, Males 8.5%, Females 14.5%.
7. Separating the rural sector of 960 persons from the urban sector of 520 persons gave the following results.

Male	Rural	9.6%	Female	Rural	6.8%	Total
						7.7%

Male	Urban	17.7%	Female	Urban	10.4%	Total
						12.1%

8. The percentage of unknown diabetics detected was in excess of 50%.

The fourth study done by D J S Fernando et al[5] in a suburban population, where approximately 250 persons who had a normal GTT on migration for foreign employment were studied three years later on their return with a repeat GTT. They were compared with similar age and sex matched group who did not leave the country for this period. The relative increased risk of the first group developing diabetes was 2.3 times that of the second group.

COMPLICATIONS OF DIABETES

Complications of diabetes have been studied by D J S Fernando et al and the following information is available.

1. Prevalence of Retinopathy in a Sri Lankan Diabetes Clinic[6].
 - a) 1003 consecutive patients
 - b) Standard WHO criteria.
 - c) 31.3% had retinopathy
 - d) 4.1% was blind due to severe retinopathy
 - e) 23% had cataract
 - f) 6.2% were blind due to cataract
 - g) 20% had hitherto unknown refractory error.

Retinopathy accounts for significant visual handicap, so do cataract and refractory errors. All of these can be detected early and attended to by routine screening.

2. Prevalence of macrovascular disease and lipid abnormalities in diabetic patients in Sri Lanka [7]
 - a) 500 clinic patients were studied together with 250 controls matched for age and sex in a clinic environment.
 - b) Macrovascular disease was assessed using modified WHO questionnaire and Minnesota coding for ECG recordings.
 - c) Results were as follows:-
 - 21% of diabetic patients and 14.3% controls had hypercholesterolemia ($P < 0.05$).
 - Macrovascular disease was present in 13.4% of diabetic patients and 8.2% of controls ($P < 0.05$).
 - Hypertension 15.6% versus 4.8% ($P < 0.05$).
 - Obesity 16.2% versus 9.7% ($P < 0.05$).
 - Peripheral vascular disease 5.6% versus 2.0% ($P < 0.05$ %)

- ECG abnormalities 12% versus 6% (P < 0.05).

In summary, we feel that hyperlipidemia and macrovascular disease is common in NIDDM patients in Sri Lanka and account for significant morbidity.

3. Prevalence of neuropathic ulceration in Sri Lankan diabetic patients[8].
 - a) 500 randomly selected diabetic patients were screened for neuropathy in a setting of a diabetes clinic using a neuropathy symptoms score, neuropathy disability score, and pressure perception threshold using Semmes Weinstein monofilaments.

Results were as follows:

1. Patients with neuropathy were significantly older.
2. They had diabetes for a longer period of time.
3. 10.2% had history of foot ulceration or amputation.
4. 5.1% had neuropathic foot ulcers at presentation.
5. 2.8% had developed an ulcer within one year of developing diabetes.
6. 4.8% had a history of lower extremity amputation.

Neuropathic ulceration is a significant cause of morbidity in patients with diabetes. 1/3 of patients attending the clinic had a risk of foot ulceration. Preventive foot care programmes are absolutely essential.

DISCUSSION AND CONCLUSION

Diabetes in Sri Lanka seems to be mainly of the NIDDM variety. It is distributed across the country amongst all ethnic and socio economic groups. IDDM and MRDM in its classical form, are rare. Definite data is not available. IDDM register is in the process of being developed. The lowest prevalence of NIDDM is in the truly rural low socio economic, labour intensive group as shown in the first survey. Occurrence of diabetes in this community is uncommon in the younger age group and is not related to obesity. As we move to the

suburban and truly urban groups, the rate of diabetes prevalence increases significantly and the age of onset decreases though the maximum prevalence is still in the over 60 age group.

Comparing the first survey done in 1987 and the latest survey in 1995 in a similar rural setting, we find the following results in a similar age group namely:-

Rural (25-74 year age group)

	1987 Survey	1995 Survey
DM	3.64%	7.7%
IGT	8.17%	13.5%
Total abnormal GTT	11.81%	21.2%

Comparing the suburban survey of 1993[3] with the urban sub group of the 1995 survey[4], we find the following differences.

1993 Suburban Survey		1995 Urban Survey	
DM	5.02%	DM	12.1%
IGT	5.27%	IGT	14.4%
Abnormal GTT	10.29%	Abnormal GTT	26.5%

Double-digit prevalence is seen in the latest survey amongst urban population and is truly a cause for concern. As for IGT, we seem to be having a major reservoir starting with the younger age groups waiting to become diabetics as we reach old age or develop obesity. It is therefore, absolutely necessary that we as a country, with a changing age pattern and increase longevity together with rapidly modernising life styles, take serious note of the potential danger of diabetes as a major health hazard. This is classically shown in the fourth study where a brief period of altered life style in a foreign country rapidly highlights the potential of diabetes. It is also wise to note that we have a serious under nutrition problem in Sri Lanka which may have a great significance in the high prevalence of diabetes especially in the light of the connection between impaired Intra Uterine Nutrition and the development of NIDDM as professed by Hales and Baker[9].

Estimate of undiagnosed patients is highest in the rural population at over 50% and is least in the urban population at around 21%.

The estimate for future prevalence by the year 2025.

We seem to be doubling our prevalence rates every decade if we compare the first[2] with the third survey[4]. By this calculation, we should be tripling our current estimate of 1 million patients to that of 3 million patients by the year 2025.

The cost of complications as detected in references 6, 7, and 8 is a significant burden to the individual family and the nation due to serious illness producing amputation, blindness, heart and neurological problems. This has been addressed by the Diabetes Association of Sri Lanka, which has developed a center for Education, Clinical services and Research. We run a single visit-screening programme for early detection in addition to specialised clinics in neuropathy, foot care, eye, cardiac and lipid and pregnancy.

Our public awareness programme includes both direct and indirect education the later being through printed and electronic media and the former through meetings for the members and the general public in different forums.

REFERENCES

1. Ramanujam P, Nestel P. Fourth National Nutrition and Health Survey – Ministry of Policy Planning Sri Lanka; 1995.
2. King H, Rewers M. WHO AD HOC Diabetes Reporting Group. Global Estimates for Prevalence of

Diabetes mellitus and impaired glucose tolerance in adults. *Diabetes Care* 1993; 16 : 155-77.

3. Fernando D J S. Impaired Glucose Tolerance and Diabetes Mellitus in suburban Sri Lankan Community. *Postgraduate Medical Journal* 1994; 70 : 347-9.
4. Samarage S M. Prevalence of Diabetes Mellitus in Sri Lanka. Msc Thesis.
5. Fernando D J S. High incidence of Diabetes Mellitus in Migrant Sri Lankan workers. Personal Communication.
6. Fernando D J S. Prevalence of Retinopathy in a Sri Lankan Diabetes Clinic. *Ceylon Medical journal* 1993; 38 : 120-3.
7. Fernando D J S. Prevalence of Macrovascular disease and Lipid abnormalities amongst Diabetes patients in Sri Lanka. *Postgraduate Medical Journal* 1993; 69 : 557-61.
8. Fernando D J S. The Prevalence of Neuropathic Foot Ulceration in Sri Lankan Diabetic Patients. *Ceylon Medical Journal* 1996; 41 : 96-8.
9. Hales C N, Barker D J P et al. Fetal and infant growth and impaired Glucose Tolerance at age 64. *BMJ* 1991; 303 : 1019-22.