

Epidemiology of Diabetes Mellitus in a Referral Hospital in a Tropical Developing Country

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Diabetes mellitus has previously been said to be uncommon in the tropics¹⁾. Clinicians in these regions are, however, treating a rapidly increasing number of diabetic patients, thus necessitating establishment of diabetic clinics in major hospitals. In Kenya, a diabetic clinic was started at Kenyatta National Hospital in 1966. By 1970 the clinic was functioning predominantly as a referral unit. The following is an account of the incidence and prevalence of diabetes mellitus at the clinic during the years 1970 to 1979.

PATIENTS AND METHODS

Patients are referred to the diabetic clinic from the wards and filter clinics of Kenyatta National Hospital, and from provincial, district, private and mission hospitals all over the Republic of Kenya. Thus the figures for diabetic patients attending the referral clinic can be taken as being representative of the diabetic position in Kenya. Furthermore, private medical practitioners also refer their newly diagnosed diabetics to the clinic for stabilizing treatment. Treatment in Kenya has been free in all government hospitals and dispensaries for many years. This further supports the contention that all income groups are represented in the diabetic clinic. The standard diagnostic criteria for diabetes used at the clinic were: persistent glycosuria, random blood sugar in excess of 11 mmol per litre and abnormal glucose tolerance test following ingestion of 50 g glucose. At the moment the clinic treats mainly poorly controlled diabetics and newly diagnosed cases for stabilization of their control.

As a policy, well-controlled diabetics are transferred to their nearest hospital for follow-up. This includes all diabetics who are controlled on diet alone. Unfortunately, this does not always work as the majority of the patients prefer to be looked after by the clinic at Kenyatta National Hospital and are prepared to travel long distances for this purpose.

RESULTS

Table 1 shows the total number of newly diagnosed cases of diabetes mellitus that were registered in the diabetic clinic during the period 1970 to 1979. The clinic operates once a week on a Friday morning. The figures in Table 1 show that the incidence of diabetes mellitus is continuously rising. The incidence for 1979 was four times that for 1970. It can also be clearly seen from this table that

TABLE 1. *Newly diagnosed patients attending Diabetic Clinic, Kenyatta National Hospital, Nairobi, from 1970 to 1979*

Year	IDDM		NIDDM		Total
	Males	Females	Males	Females	
1970	17	9	57	35	118
1971	18	13	73	49	153
1972	28	14	94	67	203
1973	35	22	103	73	233
1974	36	22	132	106	296
1975	30	12	141	74	257
1976	50	30	175	103	358
1977	42	20	164	105	331
1978	43	19	214	116	392
1979	62	37	240	125	464

IDDM, insulin-dependent diabetes mellitus ; NIDDM, non-insulin-dependent diabetes mellitus.

in every instance, male diabetics exceed female diabetics by a factor of at least two to one. This applies to both insulin-dependent and insulin-independent diabetics. Table 1 also shows that insulin-dependent diabetics constitute about 25% of the total diabetic population at the clinic. About 70% of the non-insulin-dependent diabetics are controlled on oral hypoglycemic agents of the sulfonylurea group. The biguanide agents are not used at the clinic principally because of their propensity to cause lactic acidosis. Only about 5% of the total diabetic population are adequately controlled solely by diet.

Table 2 shows the prevalence of diabetes at the clinic during the years 1970 to 1979. The figures represent the sum of the diabetic population excluding defaulters, subjects who have since died and well-controlled diabetics discharged to their nearest hospitals for follow-up.

Thus the figures in this table represent the current prevalence at the clinic. It is immediately obvious that prevalence increased by nearly 1000% during the decade reviewed. National population censuses which were carried out in Kenya in 1969 and 1979 revealed that the average population growth in Kenya is about 3.9% per annum. Thus the rate of increase of the diabetic population in Kenya exceeds by far the population growth rate. Kenya's current population is 17 million.

Table 3 shows the age distribution profile for insulin-dependent diabetics during the years 1970 and 1979. The corresponding profiles for the years 1971 to 1978 were essentially similar in distribution trend. This table illustrates two important points. Firstly if the cut-off point for juvenile-onset diabetes is taken to be the age of 31 years then more than 50% of insulin-dependent diabetics are

TABLE 2. *Prevalence of diabetic patients at Kenyatta National Hospital, Nairobi, 1970 to 1979*

Year	Prevalence
1970	469
1971	440
1972	641
1973	882
1974	1189
1975	1471
1976	1815
1977	2167
1978	2553
1979	3009

TABLE 3. *Newly diagnosed cases of insulin-dependent diabetics during the years 1970 and 1979*

Age (in years)	1970		1979	
	Males	Females	Males	Females
< 10	—	—	—	1 (5½-yrs)
10-19	1	4	10	14
20-29	5	4	14	7
30-39	1	1	20	7
40-49	3	—	10	5
50-59	6	1	4	2
60-69	1	—	4	—
≥ 70	—	—	—	1
Total	17	10	62	37

of the juvenile-onset category. Secondly, the figures show a cohort tendency; that is, the age-group of maximum incidence of insulin-dependent diabetes in 1970 was the second decade whereas the corresponding age-group for 1979 was the third decade. Whether this is a real phenomenon is not certain and warrants careful attention to the life-events of this cohort prior to the onset of their diabetes.

DISCUSSION

Three significant observations can be derived from this study. First, male diabetics exceed female diabetics in numbers at the clinic. This applies to both insulin-dependent and insulin-independent diabetics. This observation should be interpreted cautiously. Most of the patients who attend Kenyatta National

Hospital are in fact residents of Nairobi, the capital city of Kenya with a present population of about 750,000. A large number of these people are men who are part of a "migrant labor pool", most of whom leave the rest of their families in the rural areas. Male predominance in the clinic may thus just be a reflection of this status quo.

The second observation relates to the incidence and prevalence of diabetes in Kenya. As pointed out earlier, the diabetic clinic at Kenyatta National Hospital receives patients from the entire Republic of Kenya. Thus the trend at the clinic may be regarded as representative of the situation in Kenya. Clearly, the rate of increase of the diabetic population in Kenya, therefore, exceeds by far the population growth rate. The reason for this enhanced incidence and prevalence is not clearly established but may reflect increased awareness of the problem which would, in turn, lead to more cases being diagnosed. This may further be increased by a change in the life-style of urban dwellers which may promote their risk of developing diabetes, especially the predisposed.

Finally, the apparent cohort trend in insulin-dependent diabetes requires further study to determine its significance.

CONCLUSION

In conclusion, it is apparent that the number of diabetic patients is rising rapidly, mainly in the urban areas of Kenya. Whether this is due to dietary changes that occur as a consequence of urbanization as postulated by Akesode²⁾, or follows other factors which are as yet unknown, remains to be established. It is nevertheless true that urban populations tend to consume refined starches and sugars in place of the generations-old unrefined diet of grains, cereals and vegetables that is part of the culture in the rural areas.

References

- 1) Darragh, J.H., Hutchinson, A.R. & Mngola, E.N. (1971) The diabetic clinic, Kenyatta National Hospital: review of results of treatment and recommendations. *East Afr. med. J.*, **48**, 327-335.
 - 2) Akesode, F.A. (1979) Physiological relationship of nutrition and diabetes mellitus. *East Afr. med. J.*, **56**, 54-58.
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