Presentation of Diabetes Mellitus at the University Teaching Hospital, Lusaka

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SUMMARY

The mode of presentation of 118 insulin-dependent (IDD) and 187 non insulin-dependent diabetics (NIDD) is outlined. The complications as well as associated diseases are presented.

Eighty-six males were insulin-dependent and ninety-eight males were non insulin-dependent. Thirty-two females were insulin-dependent while eighty-nine females were non insulin-dependent. The age range was 14–50 years with a mean of 34.3 years for the insulin-dependent patients while the age range and mean for the non insulin-dependent patients was 30–50 years and 45.7 years respectively. The range for the duration of diabetes mellitus was 0.5–312 months with a mean of 52 months for the insulin-dependent patients while it was 1–228 months and 55 months respectively for the non insulin-dependent patients. In the insulin-dependent group there were 107 Africans, 9 Asians and 2 Europeans while in the non insulin-dependent group there were 143 Africans, 43 Asians and 1 European.

MATERIALS AND METHODS

From August, 1977 to December 1979, patients being followed at the Diabetic Clinic of the University Teaching Hospital (UTH) for diabetes mellitus were studied retrospectively. Since these were all out-patients it was assumed that their diabetes mellitus was in reasonable control as judged by their clinical status and fasting blood glucose measured by the Ames Eyetone machine at each clinic visit. The total number of patients under study was three hundred and five (305). Each patient was studied for original symptoms and signs at the time of diagnosis of the diabetes mellitus, complications developing later during follow-up and other non diabetic diseases associated with their diabetic illness but not regarded to be complications of diabetes mellitus.

EVALUATION OF PATIENTS

Subjects were evaluated while on either insulin or oral hypoglycaemic agents. Insulin regimens included either soluble insulin or lente insulin. Oral hypoglycaemic agents included chlorpropamide (diabenese) or glibenciamide (daonil).

Each patient had a fasting blood glucose estimation by Ames Eyetone machine[4] at each visit as well as urine testing for glucose and ketones to monitor control. The history and physical examination at each visit sought to highlight symptoms and complications of diabetes mellitus and were noted if present. When indicated, ancillary examinations such as electrocardiogram, chest X-ray and opthalmological examinations were also carried out.

A patient was considered to be in good diabetic control when he/she was asymptomatic and had fasting blood glucose of between 70 and 120 mg/dl or a two hour post prandial sugar of less than 140 mg/dl.

At our clinic it is the practice to treat pregnant diabetic patients with three doses per day

of soluble insulin. Lente insulin and oral diabetic agents are discontinued as soon as pregnancy is suspected.

A total of four patients were studied by radiology and endoscopy for symptoms suggestive of peptic ulcer and two were studied serologically and radiologically for symptoms and signs suggestive of rheumatoid arthritis. In addition one patient was studied for primary hypothyroidism and another was studied for sickle cell anaemia.

RESULTS

TABLE I – Personal Data

There were 118 insulin-dependent and 187 non insulin-dependent diabetics under review. The age range in years was 14–50 years with a mean of 34.3 years in the insulin-dependent diabetics. In the non insulin-dependent diabetics the age range was 30–50 years with a mean of 45.7 years. Any indigenous Zambian patient whose age was stated to be over 50 years was excluded from age analysis because of unreliability of birth records more than 50 years ago. There were 86 males and 32 females in the insulin-dependent group. In the non insulin-dependent group there were 98 males and 89 females.

The duration of diabetes mellitus ranged between 0.5 to 312 months with a mean of 52 months in the insulin dependent diabetics. In those who were non insulin-dependent, the duration of the disease ranged between 1 to 228 months with a mean of 55 months. Among the insulin-dependent diabetics 107 were of African origin (indigenous Zambians) 9 were of Asian origin and 2 were of European origin. In the non insulin-dependent diabetics 143 were of African origin, 43 were of Asian origin and 1 was of European origin.

PRESENTATION

TABLE II – Polyuria/Polydypsia

This was the commonest symptom and was present in 51% of all patients. Although not shown, polyuria/polydypsia was associated with nocturia in all cases.

Weakness

This was the second commonest symptom. It was present in 12% of all patients. This symptom was non specific and was interpreted differently by paitents. It is used here to include loss of energy as well as easy fatiguability.

TABLE I

PERSONAL DATE PERSONAL DATA

PARAMETER	NON INSULIN-DEPENDENT DIABETICS	INSULIN-DEPENDENT DIABETICS
Total	187	118
Age range (yrs)	30 - 50	14 - 50
Mean Age (yrs)	45.7 (n=82)	34.3 (n=75)
Male	98	86
Female	89	32
Duration of Diabetes (months)	1 - 228	0.5 - 312
Mean Duration of Diabetes (months)	55	52
African	143	107
Asian	43	9
European	1	2

TABLE II

Mode of presentation of Diabetes Mellitus in Zambian Diabetic Patients

PRESENTATION	NON-INSULIN DEPENDENT DIABETICS	INSULIN-DEPENDENT DIABETICS	TOTALS
Polyuria/Polydypsia.	89	66	155
Weakness	11	25	36
Pyogenic Infection	11	15	26
Ketoacidosis	0	29	29
Loss of Weight	10	6	16
Blurring of Vision	10	5	15
Pruritus Vulvae	6	0	6
Dysesthesias	4	2	6
Balanitis	3	2	5
Abdominal pain	1	2	3
Diarrhoea	1	2	3
Impotence	2	0	2
Still birth	1	0	1
Recurrent Intra-uterine death	1	0	1
Pulmonary Tuberculosis.	0	1	1

Ketoacidosis

The practice at our clinic is to treat anyone who presents with ketoacidosis due to insulin insufficiency with insulin. Therefore, no patients in the non insulin group presented with ketosis.

Among the insulin-dependent diabetics 29 (10% of all patients) presented with ketoacidosis of varying severity as judged by urine testing for ketones as well as by low serum bicarbonate level with or without acidotic breathing. Two patients who were ketonuric and placed on at least 30 units daily of lente insulin at the time of presentation have recently required only 5 to 10 units of lente insulin daily to maintain them symptom-free and with fasting blood glucose consistently around 100 mg%. Both are males in their mid-forties and have been followed now for 2.5 and 3 years respectively. It is anticipated that they will not require insulin. It is presumed that these had reversible insulin deficiency. In both of these patients the rest of the clinical picture was compatible with a viral illness. They presumably had reversible insulin deficiency secondary to viral pancreatitis.

A third male patient aged 36 years also presented with ketotic diabetes mellitus in association with alcohol-induced acute pancreatitis requiring up to 30 units daily of soluble insulin. He too, within a year of presentation is requiring very small doses of insulin. His picture is compatible with a reversible insulin deficiency secondary to alcohol-induced acute pancreatic inflammation.

A fourth patient who presented with a non ketotic hyperosmolar hyperglycaemic state had hypernatremia (160 mEq/L) and hyperglycaemia (500 mg/dl). He presented two years ago in association with acute gastroenteritis. The insulin regimen has been progressively reduced and he now requires less than 10 units of lente insulin per day.

Pyogenic infection

This was the fourth commonest mode of presentation in both groups of diabetics and was present in 9% of all cases. The majority of the patients presenting in ketoacidosis had pyogenic infection as the precipitating cause. The commonest types of infection were furuncles, urinary tract infection and pneumonia.

Loss of Weight and Blurring of Vision

Each of these symptoms were present as modes of presentation in 5% of all cases. While loss of weight was always reversible on institution of appropriate treatment, blurring of vision was not reversible in a very small number of cases probably implying that the non reversible cases had retinopathy while the reversible cases were due to hyperglycaemia.

Less frequent modes of presentation

Of the less frequent modes of presentation pruritis vulvae in females, balanitis in males and dysesthesias in both sexes were each present in 2% of all cases while abdominal pain, diarrhoea, impotence, history of still-birth or intrauterine death and pulmonary tuberculosis were each present in 1% or less of all cases.

TABLE III – Complications and other associated diseases

Very frequent Complications

Hypertension

This was the commonest associated illness being present in 24% of all cases. The retrospective analysis could not reveal in all cases whether hypertension was a complication or an associated illness as the records in patients referred from other doctors were often inadequate in this respect.

TABLE III

Complicationsand other diseases associated with Diabetes Melitus in the Zambian Diabetic Patients.

COMPLICATION/DISEASE	NON-INSULIN DEPENDENT DIABETICS	INSULIN DEPENDENT DIABETICS	TOTAL
Hypertension	49	23	72
Ketosis	2	40	42
Peripheral Neuropathy	21	8	29
Cataracts	10	7	17
Hypoglycaemia	1	14	15
Pyogenic Infection	3	9	12
Pulmonary Tuberculosis	3	7	10
Impotence	3	4	7
Autonomic dysfunction	1	4	5
Cerebrovascular accident	2	3	5
Peptic Ulcer	2	2	4
Ischaemic Heart Disease	2	2	4
Monilial Infection	2	1	3
Non-ketotic Hyperglycaemia	2	1	3
Blindness	1	2	3
Eczema	2	1	3
Gangrene of Foot	1	2	3
Diabetic Retinopathy	25	12	37
Rheumatoid Arthritis	0	2	2
Lipodystrophy	0	2	2
Still birth	1	0	1
Primary Hypothyroidism	0	1	1
Cirrhosis of Liver	0	1	1
Pytiriasis Vesicolor	0	1	1
Sickle Cell Anaemia	0	1	1

Ketosis

Ketosis as a complication developed mostly in insulin-dependent diabetics. A very small number of patients (2) maintained on oral agents developed

ketosis as a complication. This complication was present in 14% of all cases.

Diabetic retinopathy

In conjunction with clinical examination at the diabetic clinic and objective opthalmological examination in the eye clinic, retinopathy seemed to be a very frequent complication ranking third in the frequency of complications. It was present in 12% of all cases.

The high frequency is probably explained by a more deliberate search for this complication which was being carried out in a study evaluating the efficacy of another oral hypoglycaemic agent during the period under consideration.

Peripheral neuropathy

The diagnosis of this complication was entirely a clinical one and was made in patients who complained of dysaesthesias or pain suggestive of diabetic involvement of a peripheral nerve. Ten per cent of all cases had this complication. Although loss of deep tendon reflexes confirms such an impression, it was not a sine qua non in the diagnosis of peripheral neuropathy as long as symptoms were convincing. No patient had any nerve conduction studies performed.

Less Frequent Complications

Less frequent complications were cataracts, hypoglycaemia, pyogenic infections and autonomic dysfunction including impotence. Each of these complications was present in between 4% to 8% of all cases.

Rare Complications

These were present in up to 1% of all cases and included insulin-induced lipodystrophy and still-births.

Rarely Associated Diseases

Present in less than 1% of all cases these diseases were rheumatoid arthritis, peptic ulcer, primary hypothyroidism, pityriasis vesicolor, cirrhosis of liver and sickle cell anaemia. The clinical picture in all these cases did not suggest any association between diabetes mellitus and these diseases.

DISCUSSION

The symptoms of diabetes mellitus with which these patients presented are well recognised modes of presentation[6]. The complications presented here are also well recognised[1]. The pathophysiology of most of these complications is still not completely understood[2,3]. The increased morbidity among diabetics is believed to be due to the complications of this disease. The increased mortality is largely due to vascular complications and nephropathy. The complications of this illness are thought to be due to the metabolic derangements which are present in this illness.

Consequently, the hope of all of us looking after diabetics is that by greatly minimising the metabolic derangements, we can reduce the incidence and severity of complications as well as the morbidity and mortality. It is for this reason that in every patient the symptoms and complications at each visit must be carefully recorded as a basis for future comparisons. In the absence of such meticulous records, any meaningful analysis of data is impossible. In this respect, this retrospective study has highlighted certain aspects of diabetic practice in Zambia.

In our practice, there are more males affected by both insulin-dependent and non insulin-dependent diabetes mellitus. The mean age for the insulin-dependent group is less than for the non insulin-dependent group. This is to be expected since the younger diabetics as a group are more insulinopaenic than older diabetics. It is interesting to note that inspite of the difference in mean age between the two groups, the mean duration of the illness is about the same (52 months for IDD and 55 months for NIDD). The racial representation among these patients most certainly is in keeping with the different proportions of these three races in the population in Zambia. Since this study has not addressed itself to the incidence of diabetes among the different races, I cannot say which of the three races shows more proneness to acquiring this disease in Zambia.

Since this is a retrospective study, one cannot say that the collection of data relating to modes of presentation of and complications of diabetes in this practice could not be improved upon. Certain generalisations however can be made.

Ketoacidosis and pyogenic infection

I am impressed by the frequent association of pyogenic infection and ketoacidosis whether as modes of presentation or as complications of diabetes mellitus.

Obstetrical complications

The data relating to a history of still-birth and recurrent intrauterine death needs clarification. The patients included here were referred to our clinic not only because of their unfavourable obstetrical history but also because of hyperglycaemia. Had patients been referred because of the unfavourable obstetrical history alone, regardless of whether hyperglycaemia was present or not, I feel we would have discovered more patients developing diabetes either at the time of referral or at a later date.

Pulmonary tuberculosis

Less than 1% of patients presented with pulmonary tuberculosis at the time of diagnosis of diabetes. We find that patients more often develop tuberculosis as a complication of diabetes than present with these two diseases at initial diagnosis. This point is borne out by the fact that the percentage of diabetic patients developing pulmonary tuberculosis as a complication is 3%.

This study reemphasises the fact that ketosis, retinopthy and neuropathy are very common complications of diabetes. Since hypertension is fairly common (incidence in Zambia unknown) it is impossible to say which of these patients developed hypertension as a complication of their diabetes and which ones have hypertension as an unrelated disease. Be that as it may, the presence of these two diseases in the same patient will predispose such a patient to vascular complications such as ischaemic heart disease, cerebrovascular and peripheral vascular diseases.

Viral pancreatitis

The reversible insulin deficiency after a flu-like illness in two patients is of special interest. The improvement in insulin deficiency with time is in keeping with reversible pancreatic damage. There is no direct evidence in this study for viral pancreatic damage but the clinical picture is consistent with temporary pancreatic beta cell dysfunction in association with the flu-like illness. This phenomenon has been reported in the literature[7] and would seem to be the case here.

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