DIABETES IN RHODESIAN SEPHARDIC JEWS*

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There are well-defined genetic differences between Ashkenazi (Central and Eastern European) and Sephardi (Mediterranean and Near Eastern) Jews, and this is represented in differing liabilities to some diseases.[1,2] The Jewish population of Southern Rhodesia (5,500) is largely of Ashkenazi origin, but in Salisbury (total Jewish population 2,500) there is a Sephardi community numbering about 550. Apart from a few recent arrivals, the Sephardis or their immediate ancestors came from the Dodecanese islands of Rhodes and Cos and the adjacent Turkish mainland town of Budrum (Hallicarnassus). When Rhodesia was colonized at the end of the 19th century, the original immigrants included Sephardi Jews and Greek Christians from these areas, as well as Ashkenazi Jews, mainly from Lithuania.[3]

Because of the presence of these distinct Jewish communities, which largely remained unmixed until recent years, but which have very similar economic and social backgrounds, it was decided to make a retrospective survey of illnesses in over 5,000 unselected patients of various ethnic groups seen between 1958 and 1966. This revealed a previously unsuspected high incidence of diabetes mellitus in the Sephardic community.

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THE SURVEY

The patients were all seen in a consultant practice that had no special bias towards diabetes; 30% of those seen had cardiovascular disease. Most were drawn from Salisbury and the rest of Mashonaland, but some came from other parts of Rhodesia and from neighbouring territories. African patients were only occasionally encountered. The patients of all groups were referred by the same practitioners. While the number of Jewish patients was disproportionately (approximately 3 times) higher than in the general population, the Ashkenazi-Sephardi patient ratio was comparable with that in the community, and

there were no factors likely to cause special selection of either of these groups.

Diabetes was diagnosed according to the criteria of the British Diabetic Association.[4] In all patients the urine was tested for glucose, and the great majority had postprandial blood-glucose estimations, which, in doubtful cases, were supplemented by glucose-tolerance curves.

Of 5,162 patients of all groups, 188 (3·6%) were diabetic; the incidence in the main ethnic groups is shown in Table I. The Jewish groups were more precisely classified, and data for Greek Christians were extracted for comparison (Table II). The difference in the incidence of diabetes in the Ashkenazi and Sephardi populations is highly significant ($X = 7·6$, $p<0·01$) but the figures for Ashkenazis and Greeks are comparable, and the difference between Ashkenazis and White gentiles is not significant ($p = 0·20$). Among the Indians (Table III) the few Goanese had an excess of diabetes, but the actual numbers are too small to warrant firm conclusions.

Juvenile diabetics were found in all sections except Sephardis (Table IV), but the difference between Ashkenazi and Sephardi is not significant ($p = 0·35$, 2-tailed test). The clinical presentation and age structure of mature diabetics were similar in all groups, but there was an excess of males in the mature Indian and White gentile cases, and of females in White gentile juvenile diabetics.

Pancreatic and 'potential' or latent diabetics were also found in the survey and, with doubtful cases, are listed in Table V.

TABLE I. INCIDENCE OF DIABETES IN MAIN ETHNIC GROUPS

Group	*Total*	*Diabetics*	
		Number	*%*
Jews	571	45	7·9
Indians	275	31	11·3
Gentiles	4,221	110	2·6
Miscellaneous	95	2	2·1

TABLE II. INCIDENCE OF DIABETES IN JEWISH SUBGROUPS AND GREEKS

Group	*Total*	*Diabetics*	
		Number	*%*
Ashkenazi	456	29	6·4
Sephardi (from Rhodes)	104	15	14·4
Sephardi (not from Rhodes)	10	1	10
Mixed (Ashk.-Seph.)	1	0	0
Greek Christians	89	5	5·6

TABLE III. INCIDENCE OF DIABETES IN INDIAN SUBGROUPS

Group	*Total*	*Diabetics*	
		Number	*%*
Moslem	112	10	8·9
Hindu	127	11	8·7
Goanese	28	8	28·6
Other	8	2	25

TABLE IV. MATURE AND JUVENILE DIABETICS

Group	*Mature*			*Juvenile*			*All cases*		
	Male	*Female*	*Total*	*Male*	*Female*	*Total*	*Male*	*Female*	*Total*
Ashkenazi	13	12	25	3	1	4	16	13	29
Sephardi (Rhodes)	7	8	15	0	0	0	7	8	15
Sephardi (not Rhodes)	0	1	1	0	0	0	0	1	1
Indian	18	11	29	1	1	2	19	12	31
White gentile	56	35	91	6	13	19	62	48	110

TABLE V. SECONDARY OR DOUBTFUL DIABETES

Group	*Pancreatic*	*Latent / potential*	*Doubtful*
Ashkenazi	0	2	2
Sephardi	0	1	0
Indian	2	1	1
White gentile	6	2	2

DISCUSSION

This is not a study of the prevalence of diabetes but of its occurrence in patients referred for all causes. A prospective survey of the whole community was not practical, but a retrospective study can be of some epidemiological value.[5] While observer bias cannot be excluded, the opposite outcome had actually been expected, i.e. more diabetes in the Ashkenazis than in the Sephardis.

As a general rule, Rhodesian Whites and Indians are prosperous, and almost all receive private medical care. Living conditions among the Whites are comparable, with no major differences between the 2 Jewish sections save that the traditional Sephardi diet resembles the Greek; this is only important among the older members. Both Jewish groups may make greater use of medical facilities than other groups, and this may lead to the detection of more diabetics because they present for examination regularly instead of only in the case of illness. However, the difference between Ashkenazis and gentiles in this survey was not significant, and this would not explain the higher numbers among the Sephardis. Greeks and Sephardis are similar in temperament; both groups are largely occupied in trade. Caffeine ingestion, which does not appear to be as important a factor in the pathogenesis of diabetes as previously thought,[6] is probably greater in Greeks and Sephardis than in the other groups. The higher incidence of diabetes in Sephardis than Ashkenazis or Greeks suggests that they possess a trait, possibly genetic, not present in the others.

Diabetes may be inherited as a simple Mendelian-recessive trait,[7] but others believe that multifactorial inheritance is more likely.[8] The impression that diabetes is more common in Jews than gentiles has been contradicted;[9] but if Jews do have a greater tendency to diabetes it may reflect the effects of repeated inbreeding.[10] Because it is usually difficult to obtain details of consanguinity in communities prone to diabetes,[11] the findings in the Sephardis of Rhodesia are important.

The impression that this community is highly inbred is confirmed by study of the marriage records of the Salisbury Jewish congregations, which were checked with senior members of the communities as well as the families of those concerned (Table VI). There are no known cases of consanguineous marriages in the Ashkenazi community. Until 1935, marriages between Ashkenazis and Sephardis were rare, but they have steadily become more frequent; and there are now signs that the divisions

between the communities are breaking down. The relationship between the partners in Sephardi consanguineous marriages is often close (Table VII). These figures

TABLE VI. JEWISH MARRIAGES IN SALISBURY (1910–1954)

	Sephardi congregation			*Ashkenazi congregation*		
	1910–34	*1935–54*	*Total*	*1910–34*	*1935–54*	*Total*
To members of the same group (non-consanguineous)	22	49	71	48	143	191
Consanguineous	8	13	21	*	0	?0
To members of other groups	4	27	31	0	12	12
To gentile proselytes	1	3	4	1	0	1
Total	35	92	127	49	155	204

*Information not available.

TABLE VII. SEPHARDI CONSANGUINEOUS MARRIAGES

Relationship	*Number*
Uncle-niece	1
First cousin	5
First cousin, once removed	2
Second cousin	8
Second cousin, once removed	3
More distant	2

probably understate the frequency of such marriages, as it was customary for single men to migrate to Rhodesia and, once established, temporarily to return to the island for an arranged marriage, often to a relative. This has not been possible since the outbreak of the war in 1939 and the virtual annihilation of the community in Auschwitz in 1944.[22]

Consanguineous marriages are generally more frequent in small communities[13] and are favoured by religious tradition in the Middle East.[3] They are often contracted by Moslems,[14] among whom the Jews of Rhodes had lived since the island fell to the Turks in 1522. But there is another factor favouring consanguineous marriages in this particular community. Because girls who had married men from elsewhere and left the island with them lacked the protection of their men-folk and were sometimes ill-treated, this practice was banned by rabbinical decree in 1767.[15] Men were allowed to bring wives from abroad to the island, but unless a foreigner who wished to marry a girl from Rhodes was prepared to settle on the island, the women were often forced by circumstances to marry close relatives. This tradition persisted, so that when men who had migrated from the island returned to fetch brides, it would be natural for them to marry relatives. Although the average frequency of cousin marriages in an Ashkenazi sample in Israel was higher than is usual in western countries, it was much less than that found in many non-Ashkenazi communities;[14] and experience in Rhodesia showed that consanguineous marriages were not favoured by Ashkenazis (Table VI). Cousin marriages are not a feature among the Greeks in Salisbury, but appear to be common among the few Goanese, who also had a high incidence of diabetes (Table III).

The lack of juvenile diabetics among the Sephardis is striking, but may not be statistically significant and is difficult to understand. It argues against the contention that late-onset cases of diabetes are heterozygotes, and juvenile cases homozygotes.[16] A similar situation has recently been recognized among the Navajo Indians of Arizona; maturity-onset diabetes is common, yet the juvenile form unknown.[17] Unfortunately it seems impossible to make accurate studies of the marriage patterns among the Navajo, because of the matrilineal structure and the constant changing of names.[17] The Navajo do not appear unduly prone to vascular complications, which do, however, occur in many of the Rhodesian Sephardic diabetics.

Migration from Rhodes resulted from economic decline and lack of opportunity for the young. Under conditions of poverty, the diabetic trait may have been advantageous—a 'thrifty genotype'[18] which became detrimental under the prosperous conditions in Rhodesia.

Another genetic association with diabetes of possible importance in a community from the eastern Mediterranean is glucose-6-phosphate dehydrogenase (G-6-PD) deficiency. Not only is the association between this condition and impaired glucose tolerance unclear,[19] but G-6-PD deficiency is extremely rare in Jews from Rhodes; there were no instances in a random sample of 35 subjects examined in Salisbury,[20] and only one family among those living in Israel is known to be affected.[21]

SUMMARY

Diabetes mellitus is more common in Sephardi Jews than in other European or Asian ethnic groups in Rhodesia. Most Rhodesian Sephardi Jews are the original immigrants from the island of Rhodes, or their immediate descendants. Consanguineous marriages have been favoured by them for many generations; the great frequency of diabetes is probably due to this, and not to their Jewish descent, or environmental factors alone.

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