Prize winning paper

A PILOT STUDY TO DETERMINE THE PREVALENCE OF DIABETES MELLITUS IN THE RURAL POPULATION OF SOUTH INDIA

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Following the reports on the prevalence of known diabetes mellitus cases among the Indian populations living in Southall[1], London and New Delhi[2] there has been an increased awareness that Indians might rank high in the ethnic susceptibility for diabetes. Our knowledge concerning the true prevalence of diabetes in India is limited and unfortunately the prevalence of this disease in rural population is not well known inspite of the fact that more than 70% of the Indian population lives in villages.

A summary of Indian literature on prevalence of diabetes in rural populations is given in table l.

Methods

A house to house survey was made at all households in two villages - Perugugudem and Chodimella, and within a defined area of a rural town - Eluru of West Godavari district of Andhra Pradesh State. Age and sex data was recorded for all the residents and they were asked whether anyone in the family is known to be diabetic. This survey was done in the first week of December 1986.

Results

Information was obtained on 1,948 residents, 605 residents and 1,026 residents (total 3,579) from Eluru town, Perugugudem and Chodimella respectively. Table 2 shows the detailed features of these areas surveyed for this study.

A total of 84 persons were reported diabetic, indicating crude prevalences of 2.1, 4.1 and 1.8 from Eluru, Perugugudem and Chodimella respectively. Age specific prevalences in these areas are shown for both sexes seperately in table 3. There were no diabetics reported from the population undar 25 and over 84 years of age.

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Table 1

Diabetes Mellitus in Rural Population

Author	Place	Population	Sample	Criteria for Diagnosis	Prevalence % >15 yrs	>40 yrs
Ganguly et al 1964	Sarojini Nagar, Lucknow	1,446	cluster	postprandial glycosuria confirmed by fasting and post prandial blood sugar	2.7	5.7
Jaya Rao et al 1972	seventeen villages around Hyderabad	2,006	random	random glycosuria	2.4*	4.7+
Ahuja et al 1979	Six centres in India	15,117	random stratified	2-hr post 50G glucose capillary blood glucose > 130 mg/dl	1.5	2.8
Murthy et al 1984	Tenali, Andhra-pradesh	848	random stratified	2-hr post 75G glucose blood glucose > 130 mg/dl	5.3	8.5

* > 20 Years + > 50 Years

Table 2

Socio economic profile of the study areas of Andhra Pradesh

	Eluru	Perugudem	Chodimella
Households surveyed	421	91	102
Total population	1,948	605	1,026
Literacy rate %	56.1	29.8	26.2
Cultivators %	-	67.0	10.7
Small scale workers	30.4	-	-
Approximate monthly income per household (Rs.)	1000	800	200
Nearest medical facility	in town	3 km	5 km

Table 3
Age Specific Prevalence of known Diabetes in Rural Population

Age	Eluru				Perugugudem				Chodimella			
Group	Male		Female		Male		Female		Male		Female	
years	n	%	n	%	n	%	n	%	n	%	n	%
25-29	1	1.4	0	0	0	0	1	3.2	0	0	0	0
30-34	1	1.4	2	2.9	0	0	0	0	0	0	0	0
35-39	2	2.4	0	0	0	0	0	0	0	0	0	0
40-44	3	4.9	1	1.7	0	0	1	7.6	1	3.7	2	10.5
45-49	5	10.4	1	1.9	3	20.0	0	0	1	2.7	0	0
50-54	7	12.7	5	16.7	2	18.2	1	12.5	2	8.0	0	0
55-59	1	5.0	5	23.8	1	11.1	3	37.5	3	15.8	2	22.2
60-64	1	5.6	2	8.0	0	0	4	57.1	2	20.0	3	13.0
65-69	1	14.3	0	0	2	66.7	1	14.3	0	0	0	0
70-74	2	16.7	0	0	0	0	2	100.0	0	0	0	0
75-79	0	0	0	0	1	50.0	1	100.0	2	33.3	0	0
80-84	1	100.0	0	0	2	100.0	0	0	0	0	0	0
Total	25	-	16	-	11	-	14	-	11	-	7	-

Comment

Overall prevalence of diabetes mellitus reported in this study, as 2.4% is almost similar to those in previous surveys of rural population-the prevalence in Sarojini Nagar, Lucknow was 2.3%[3], 2.5% in villages around Hyderabad[4] and l.5% in the ICMR study[5]. Two important points of interest for discussion here are the age structure of Indian population and the prevalence of unknown diabetics in the community.

The age spectrum of Indian population has assumed special significance in evaluating any prevalence study. In India 40.2% of the population is under 15 years of age[6] and in this present study, 42.6%, 44.8% and 47.6% of the populations surveyed from Eluru, Perugudem and Chodimella respectively were under 20 years of age. A large proportion of the young population is excluded from screening surveys in India as diabetes at young age is very rare here[6].

In this report, the prevalence of diabetes was 4.2% in population over 20 years of age, which is about twice that of overall prevalence. Table 4 shows four prevalence values among rural population over 40 years of age, ranging between 2.8 and 8.5%. Similar value for known diabetes reported here was 11.5% above 40 years. This in fact is a much less estimate as a true prevalence can be ascertained only by systematically applying standard diagnostic techniques. However this indicates that Indians seem to rank high in terms of ethnic susceptibility to diabetes.

It is common knowledge that diabetes is often undiagnosed or underdiagnosed in rural population, until such time as vascular complication sets in. Even then the basic facilities for blood sugar estimation are not available for diagnosing diabetes[7]. The prevalence rates reported here are grossly underestimated and a

Table 4

Age Specific Prevalence percentage of known Diabetes in Southall, Darya Ganj and present Study

Age Group years	Darya Ganj	Southall	Eluru	Perugu Gudem	Chodimella
0- 4	0	0	0	0	0
5- 9	0	0.1	0	0	0
10-14	0	0.1	0	0	0
15-19	0	0.1	0	0	0
20-24	0	0.2	0	0	0
25-29	0	0.2	0.6	1.7	0
30-34	1.3	1.0	2.2	0	0
35-39	1.8	2.2	1.3	0	0
40-44	4.1	3.5	2.7	3.3	6.5
45-49	7.7	6.7	6.0	12.0	1.6
50-54	8.6	10.2	14.1	15.8	5.6
55-59	9.0	11.2	14.6	23.5	17.9
60-64	16.9	16.7	7.0	22.2	15.2
65-69	11.7	19.2	3.3	30.0	0
70-74	12.8	15.5	10.0	28.6	0
75-79	14.9	9.4	0	66.7	25.0
80-84	7.1	44.0	25.0	66.7	0
85-89	4.5	0	0	0	0
Total	3.1	2.2	2.1	4.1	1.8

true prevalence may be many more times higher than 2.4%, if the undiagnosed diabetics in the community are taken into consideration. The Southall survey from London and the Darya Ganj survey from Delhi were done in a largely affluent Indian population but a direct comparison of these reports with this study is possible owing to similar methods of ascertainment. Although the rural population surveyed in this study had only about Rs. 200-1000 of monthly income per household and, neither adequate health awareness nor access to medical facilities, compared to Southall and Darya Ganj populations, crude

prevalence of diabetes in this study is between 3.1% of Delhi and 2.2% of London, as shown in Table 4. The age specific prevalences between 40 and 64 years of age reported here are also similar to those found in Darya Ganj and Asians of Southall, which are almost five times higher than in Europeans[1]. A high prevalence of diabetes mellitus does occur within India as well as in migrants, which cannot easily be explained.

Summary

During a house to house survey for known diabetes, 84 diabetics were reported out of a rural population of 3,579 persons, in Andhra Pradesh with a crude prevalence of 2.4%. The prevalence of diabetes above 40 years of age was 11.5%, which ranks high among the world populations. Age specific prevalence rates for 40-64 years were similar to those in Darya Ganj and Southall surveys, which are about five times more than in Europeans. Indian people including rural populations seem to have high ethnic susceptibility to diabetes.

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