

Prevalence of Diabetes Mellitus Amongst the *Bhargavas* in India

Bela Kothari, Arti Khinchi and Amit Pareek

Department of Anthropology, University of Rajasthan, Jaipur 302004, Rajasthan, India

KEYWORDS Disease. Risk Factors. Social Correlates. Community

ABSTRACT It has been estimated that India has the largest number of diabetics in the world and the incidence is rising. Many communities and minority groups, are known to be particularly vulnerable to diabetes mellitus with the prevalence rising as high as 50% in the Pima Indians of North America. One sub-group amongst the Hindu Brahmins in India, the Bhargavas are also believed to be particularly prone to diabetes. This study attempts to verify this high prevalence and analyze the influence of social factors like marital alliance, food habits, lifestyle etc. A household study covering 50% of the 519 listed Bhargava households in the city of Jaipur was carried out using a suitably structured interview schedule. The study is based on previously diagnosed Type 2 diabetes. 42.3% Bhargava households had one or more known diabetic. The overall prevalence was 16.7%. Pedigree analysis shows that 58% households had at least one primary relative with diabetes. A significant contributing factor can be the practice of surname endogamy and marital alliances within closely related gotra (clan) sub-groups. The social custom pertaining to endogamy in marriages can be an important factor in determining the high prevalence of diseases like diabetes.

INTRODUCTION

Diabetes mellitus is a major public health problem worldwide. It has been estimated that more than 33 million people in India are affected by diabetes, perhaps the largest number of diabetics in any country in the world. This number is expected to increase to 57.2 million by 2025 as reported by King et al. (1998).

A review of the literature on population based studies by Mather (1985) beginning from 1970's shows a high prevalence of diabetes in several American minority and ethnic groups, Asian immigrants and other high risk populations in different countries. Researches and current guidelines for screening diabetes show that ethnology and social attributes are important risk factors in diabetes. With the rising incidence of diabetes in India it becomes particularly relevant to ascertain its prevalence in various ethnic groups with different cultural and life style practices. One such group is the Bhargava, which forms fairly distinct and large sub-group amongst the Hindus. A common belief about Bhargavas is that they are highly prone to diabetes and many physicians today take it as an axiom that if you are a Bhargava the chances are that you are a diabetic unless proved otherwise.

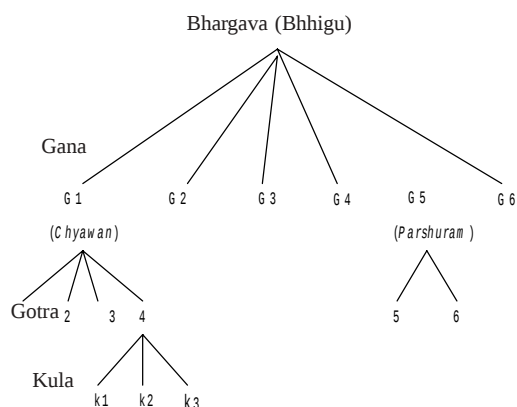
Two questions naturally arise:

- a) Is the prevalence of diabetes mellitus amongst Bhargavas higher than expected in the general population?
- b) If the disease is indeed common amongst Bhargavas could any social factors be contributing to this, e.g., marital alliances, food habits, life style etc., which are subject to correction.

THE BHARGAVA COMMUNITY

The Bhargava's are a sub-division of the Brahmin or priest caste, which is at the top of the hierarchically arranged endogamous caste system of social stratification. Bhargavas trace their origin to the sage Bhrigu and the members of his lineage Chyawan and Parshuram. They are supposed to be vegetarian and tetotallers as reported by Singh (1998). The level of education is high; 83.8% respondents were educated upto the graduate level. The Bhargavas in north India are also referred to as '*dhusar*' due to their association with the region around river Vadhua in the State of Haryana. Their social organization can be explained as comprising six exogamous patrilineal *gotras* or clans (Fig.1). These six *gotras* are grouped into 2 *ganas*. Although initially the caste comprised of 6 *ganas*, but only two of them, that of sage Chyawan (G1) and of Parshuram (G5) continued to form the Bhargava community. *Gana*, G1 is composed of 4 *gotras* and the other, G5 has 2 *gotras*. Persons belonging to *gotras* within the same *gana* cannot marry (Bhargava, 1989). This implies that persons from

Correspondence Address: Dr. Bela Kothari, 50 Gem Enclave, Pradhan Marg, Malviya Nagar, Jaipur 302 017, Rajasthan, India
Telephone: 91-0141-2522565;
E-mail: belagem@datainfosys.net



Each gana has 2 or more gotras: 6 in all; Each gotra is composed of one or more patrilineages (kulas): 36 kulas in 6 gotras.

Fig. 1. Organization of the Bhargava sub-group

gotra 1,2,3 and 4 can marry only in gotra 5 or 6.

When the community segregated from the other sub-divisions of the Brahmin caste for the maintenance of its subculture and sense of identity it became difficult to follow the rule of *gotra* exogamy. Due to its small numerical strength at the time of its separation, each *gotra* was further divided into *kulas*. A *kula* is the exogamous patrilineage worshipping the same family goddess as defined by Hutton (1961). The six now endogamous *gotras* thus came to be composed of 36 exogamous *kulas* as found by Agrawal et al. (2001).

MATERIAL AND METHOD

A house to house study was conducted in the city of Jaipur with a population of approximately 2.2 million. It is the capital of Rajasthan State situated in the largely semi-arid north-western part of India. Sample selection was done using the 'Bhargava Directory 1997'. This Directory has a zone-wise comprehensive list of all households of the community residing in Jaipur. Out of the total 519 households, every alternate house was selected giving a sample size of 260 households.

The overall response rate was 88% with 26 non-respondents having shifted from their given address, while 5 declined to answer any queries regarding diabetes in the household. This gave a final sample of 229 households. The selected households were visited by the research team

from October to December 2002, and an interview schedule was administered to the head of the family. The family considered here is that of the adult male although disease history of his wife's natal family was also recorded.

The questions included in the interview schedule pertained to:

- Knowledge about anyone in the family (close consanguine and affinal relationship) having diabetes (*madhumeah* in Hindi; blood sugar problem in colloquial usage),
- How sure they were of the diagnosis and its confirmation by proper blood tests,
- Socio-demographic characteristics, pedigree and marital alliances,
- Food habits and life style, and
- What in their opinion could be the cause of frequent occurrence of diabetes amongst Bhargavas.

RESULTS

Diabetes Prevalence: In the study, 42.3% Bhargava households presently had one or more known diabetic. The total number of diabetics falling within these households was 119 i.e., 22 households had more than one case. The distribution was almost similar in males and females with 60 and 59 diabetics respectively. Table 1 shows the age specific prevalence of diabetes in the surveyed population.

The highest prevalence of known diabetes was found among persons 55-59 years old. In 57.1% cases diabetes was first detected before the age of 50 years (Fig. 2). All the 119 diabetics referred to by the respondents had developed diabetes after 25 years of age. There was no case below 25 years (juvenile diabetes) known to the households. The

Table 1: Age specific distribution of known diabetics, at the time of survey.

Age (years)	Total population	No. of known diabetics	Prevalence (%)
25-39	213	1	0.4
40-44	96	5	5.2
45-49	77	17	22.0
50-54	74	16	21.6
55-59	61	23	37.7
60-64	51	15	29.4
65-69	55	17	30.9
70+	84	25	29.6
Total	711	119	16.7

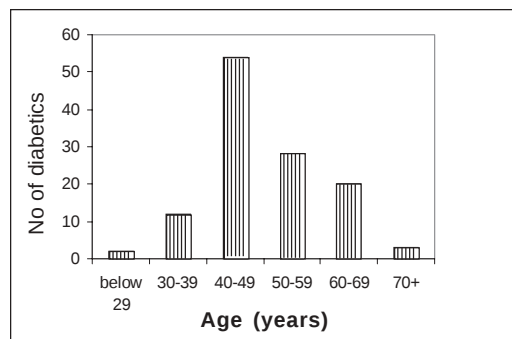


Fig. 2. Age at which diabetes was first detected

age at diagnosis for majority (45.3%) of the diabetics was during 40-49 years.

Thus it is the maturity onset type of diabetes we are dealing with in which heredity as well as

Table 2: Community perception about risk factors behind diabetes

Risk factors	No. of respondents
Family history; heredity	126
Food habits; excessive fat, sugar intake	77
Close marital alliance; endogamous marriages	60
Less physical activity; sedentary job	27
Mental tension / Stress	19
Cannot say	27

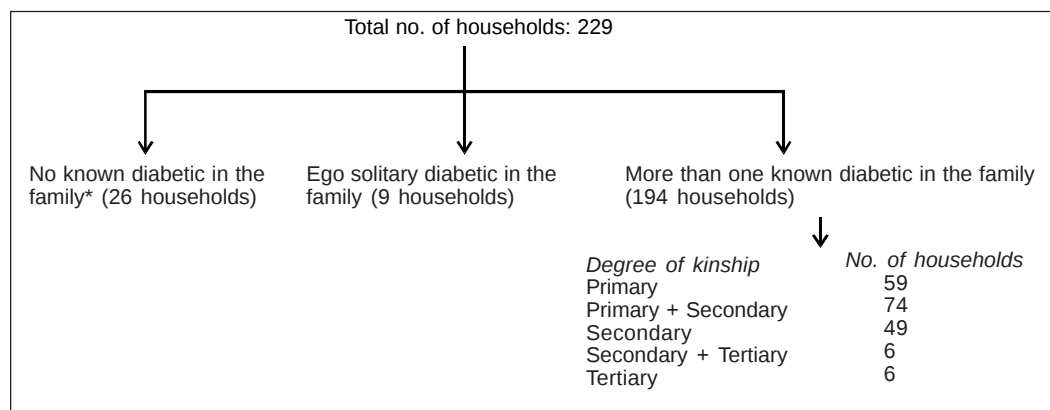
lifestyle can have a major role to play. The mean and median known duration of diabetes was 10.4 and 8 years respectively. The average known age at onset was 48.9 years, implying that these subjects developed diabetes in the most productive years of their life.

Pedigree Analysis: A detailed family pedigree was drawn to analyze any genetic inheritance of the disease. The details examined included frequency, age at onset and familial ties. Figure 3 shows the results of pedigree analysis in the sample.

The inferences drawn from this briefly are:

- Only 26 households out of 229 had no diabetic in the household or any kin category.
- Vertical transmission of diabetes through two or more generations was found in 41.1% diabetics.
- In 26.8% households both parents were diabetic. The prevalence of diabetes amongst the offspring of these conjugal diabetic parents was 11.7%.
- The average age at onset in diabetics with family history was 44.9 years and those without family history was 52.8 years.
- 58% households had at least one first degree relative with diabetes.

Marital Alliances: It was found that 97.3% marriages consummated were within the Bhargava sub-division itself. Out of these 23.5% marriages were within the same *gotra* (traditionally barred), 14.4 % were correctly married exogamously at the *gotra* level whereas 59.3% were not even aware of their *gotra* and *kuldevi* and had not bothered about this while finalizing the marriage of family members. Only 6 respondents had married outside the Bhargava fold. This shows that endogamy at the surname as well as *gotra* level is common, and although they belong to the broad caste group of Brah-



*Family = households + kins

Fig. 3. Results of pedigree analysis in the sample

mins but they do not marry outside their own surname.

Life Style: The Bhargavas are by and large vegetarian and teetotallers. As regards food habits in relation to average daily consumption of fats and sugar, the households were questioned about their quality of food. It was found that 48.9% households consumed *puris* and *paranthas* fried in *ghee* (refined butter) or oil almost on a daily basis. Fried salty snacks were relished by 60% households everyday. Surprisingly the daily consumption of sweets and desserts was low at 24%. The stated reason behind this low consumption was their fear of diabetes. This implies that they were well aware of the Bhargava vulnerability for diabetes.

Only 4.6% men, occasionally consumed alcohol, women culturally avoid it. 9.4% men and women were non-vegetarian while amongst the diabetics only 4.25 were so. The emerging city culture makes them look at physical labour as something below their dignity, while sport clubs, gymnasiums etc. are too costly for most. A sedentary lifestyle could therefore, be an important risk factor for the urban population as opposed to the rural. Findings show that 79% of the respondents were employed in jobs with desk work.

Awareness About Diabetes: The respondents were asked about their perception on the prevalence of diabetes in their community and the possible factors responsible for this. 94.7% respondents were well aware that there is high prevalence of the disease in their community. Because of this they frequently attend the diabetes detection camps organized by the community and other health organizations. It was interesting to note that although there was no history of diabetes in 26 households as many as 22 of these were still regularly getting themselves checked for diabetes whenever the opportunity arose, of those which did not have diabetes at all, only 4 households had never got themselves checked for it. Presuming that diabetes is common amongst Bhargavas, how do the community members perceive the problem and what factors do they hold responsible for this.

The multiple reasons given for this vulnerability by the respondents were as follows (Table 2). In general, the respondents explained away the diabetes in their families by attributing it to the high socio-economic status of Bhargavas – rich food and comfortable living. However, in-

depth interviews revealed that 55% were well aware of the role of heredity and marital alliances restricted within the small community as a major factor behind diabetes. Many respondents expressed their desire to marry their children outside the Bhargava community and were of the opinion that inter-caste marriages should be promoted. Low down in priority was a sedentary lifestyle and physical and mental stress at the workplace or at home.

DISCUSSION

The prevalence of diabetes is difficult to determine because of the different criteria used and overall a prevalence of 1-2% in the general population has been considered reasonable as reported by Isselbacher (1994). But as Barcelo et al. (2001) have reported, in certain ethnic groups like the Pima Indians the prevalence could be as high as 50%. High prevalence has also been found among Mexican Americans (25.7%), Aboriginal Australians (25%), Non-Hispanic Blacks (19.8%) etc. The common belief that the Bhargava community in India for one reason or the other, is more vulnerable to diabetes than others has prompted the present study.

Interestingly, 5 households out of the 229 surveyed declined to participate in the study and give any information regarding diabetes in the family for fear that this may jeopardize the marriage prospects of their sons and daughters. Obviously they were aware of the high prevalence of diabetes amongst Bhargavas and its possible social implications.

The total number of individuals covered directly in the study of 229 households comes to 711, out of whom 119 were known diabetics. This gives a prevalence of 16.7%. This prevalence is appreciably higher than 3.8% reported in India in the general population. It appears therefore, that the Bhargavas rank amongst communities with a high prevalence of diabetes both in India and the world over. Vertical transmission of diabetes through two or more generations was seen by Ramchandran et al. (1998) in 41.4% diabetics as compared to 14% Indians or 4% Europeans. However, direct comparison is difficult owing to the absence of ethnic group based studies of diabetes mellitus in India.

The high prevalence may relate to heredity and marital alliances within the small community. In India, the Hindus have been following an elabo-

rately defined endogamous marital pattern for centuries. Each individual was expected to leave the 4 *gotras* – that of his father, mother, paternal and maternal grandmothers. This implies that restriction of marriage within the caste is an important requirement of such marriages. However, within the caste there is a sanction against marriage between relations within the same clan or *gotra*. Each endogamous caste or sub-caste contains within it a number of exogamous units, known as *gotra* or clan. As Bhasin and Walter (2001) have revealed that marriage within the same *gotra* is not preferred, hence consanguinity is avoided. However, Bhargavas are peculiar in that they practice a further degree of endogamy. It was found that along with surname endogamy, *gotra* endogamy is also practiced. A study by Bhatnagar and Agrawal (2002) reveals that endogamous marriages at the surname and *gotra* level seem to be more commonly practiced than reported earlier. Exogamy now is largely practiced only at the *kula* or patrilineage level.

Although the Bhargavas themselves try to explain it away on the basis of their rich diet, high standard of living and comfortable sedentary life. From a biomedical standpoint it seems reasonable to assume that marriages amongst a small sharply defined community can certainly enhance the chances of serious diseases like diabetes. Greater freedom to the youth amongst the community to marry outside the Bhargava fold would presumably help in keeping diabetes in check. It also needs to be emphasized whether factors like rich food, sedentary life style, mental stress are direct

etiological causes of diabetes or simply exaggerate an already existing disease. This is needed if rational measures are to be implemented in the community to reduce the high prevalence.

REFERENCES

- Agrawal, S., Bhatnagar, S. and Khan F.: Distribution of HLA class II Antigens in three North Indian Populations. *International Journal of Human Genetics*, **1(4)**: 283-291(2001).
- Ahuja, M.M.S.: Epidemiological studies on diabetes mellitus in India, pp 29-38, In: *Epidemiology of Diabetes in Developing in Countries*. M.M.S. Ahuja (Ed). Interprint, New Delhi (1979).
- Barcelo, A., Daroca, M. and Ribera, R.: Diabetes in Bolivia. *Pan American Journal of Public Health*, **10 (5)**: 318-322 (2001)
- Bhargava, P.L.: *A History of the Bhargava Caste*. Nandlal Bhargava Publication, Agra (1989).
- Bhasin, M. K. and Walter, H.: *Genetics of Castes and Tribes of India*. Kamla-Raj Enterprises, Delhi (2001).
- Bhatnagar, S. and Agrawal, S.: Surname endogamy among the Brahmins of India. *Current Sociology*, **50 (6)**: 425-429 (2002).
- Hutton, J.H.: *Caste in India*. Cambridge University Press, Bombay (1961)
- Isselbacher, K.J., Matin, J. and Braunwald, E.: *Harrison's Principles of Internal Medicine*. McGraw-Hill, U.S.A. (1994)
- King, H., Aubert, R.E. and Herman W.H.: Global burden of diabetes, 1995-2025. *Diabetes Care*, **21**: 1414-1431(1998).
- Kolenda, P.: *Caste in Contemporary India*. Rawat Publication, Jaipur (1997).
- Ramchandran, A., Jali, M.V. and Mohan, V.: High prevalence of diabetes in an urban population in South India. *British Medical Journal*, **297**: 587-90(1998)
- Singh, K.S.: *Peoples of India*. Anthropological Survey of India, Kolkata; Oxford University Press, New Delhi (1998).