High dietary fat intake and cigarette smoking as risk factors for ischaemic heart disease in Bangladeshi male immigrants in East London

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SUMMARY A study was made of smoking and dietary habits in middle aged Bangladeshi men living in East London to investigate possible causes of the previously described high ischaemic heart disease risk in this group. The results showed that these individuals were 50% more likely to smoke than Caucasians living in the same area, after adjusting for age and social class. More striking, however, was the very high fat intake of over 200 g/day, which is twice the national average and accounted for nearly 60% of total energy intake. Interestingly, much of the dietary fat was from vegetable oil, and the ratio of polyunsaturated to saturated fatty acids exceeded the accepted recommended minimum.

The population of Bangladeshi men in the London Borough of Tower Hamlets has previously been shown to have a 30% higher age adjusted incidence of myocardial infarction than that of other men in that Borough.¹ This finding is consistent with the results from mortality studies that males born in the Indian subcontinent have the highest mortality of all ethnic groups in the United Kingdom from ischaemic heart disease.² The clinical impression is that middle aged Bangladeshi men are heavy smokers and have an "unhealthy" diet though these aspects have not been quantified. This report describes the findings of a general practice based survey of smoking habits in Bangladeshi and non-Bangladeshi men together with the results of an in depth dietary inquiry in a small sample of the Bangladeshi men.

Subjects and methods

SUBJECTS

The subjects were drawn from the age sex register of a local general practice participating in a heart disease prevention programme. All Caucasian and Bangladeshi men aged between 35 and 69 were invited to attend for a screening examination to include smoking history, weighing, urine testing, and blood pressure measurement. After allowing for errors in the age sex register, 116 (50.1%) of the Bangladeshi and 211 (58.1%) of the Caucasian men

were screened. A non random quota sample of 12 of the Bangladeshi men whose English was adequate agreed to take part in the detailed dietary survey, which was not carried out on the Caucasians.

SMOKING ENQUIRY

This was achieved using an interviewer administered questionnaire in English based on the General Household Survey.³ Most of the Bangladeshi men understood and spoke sufficient English to answer the questions, though an interpreter was available for the few whose comprehension was inadequate. Estimates of the number of cigarettes smoked per day were, however, frequently inconsistent, and thus for the purposes of analysis the fact of current smoking or not was used as being more reliable.

DIETARY ENQUIRY

Conventional dietary survey methods, for example the 24 hour recall⁴ and the diet interview,⁵ were inappropriate for studying the Bangladeshi men because of language and cultural barriers. It was therefore decided to study the dietary habits of a small sub sample of these men in depth. Thus the 12 study men were visited at home for a single day. This permitted observation of their wives during preparation and cooking of the food and allowed weighings of the raw ingredients. Further observation of these individuals during the main meals also permitted weighing of the final portion

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size after allowing for wastage. The men and their wives were then interviewed both about the food consumed outside the main meals, for example at breakfast, and also their daily variation in menus. In this way a pattern of diet consumption was constructed for the study day's menu with accurate portion sizes derived. Thus data were obtained only for that single day but the reported pattern of eating within this group showed little within individual daily variation. Thus without exception all the men interviewed had meat or fish curry for the two main meals every day. The data were coded for analysis using standard food tables⁶ available for computer analysis. However, many of the items were not available in the standard tables and were calculated manually from Gopalar's *Nutritive value of Indian foods*⁷ and specialist food tables for Indian foods.⁸

Results

SMOKING

Eighty-eight (75.9%) of the 116 Bangladeshi men interviewed were current smokers compared with 91 (43.1%) of the 211 Caucasians. However, despite the narrow age range, the Bangladeshis surveyed tended to be younger and have a less favourable social class distribution. After adjustment for these two possible confounding variables (table 1) there was still an excess of about 50% in the number of Bangladeshi smokers (58.9 expected, 88 observed, $p < 0.001$).

DIET

The main features of the diet of these men are summarised in table 2. The most noticeable finding is the very high mean daily fat content of 215.5 (SD 49.2) g/day. This resulted in an equally high mean contribution of fat to total energy intake, viz, 56.7%

Table 1 Current smoking rates (%) in Bangladeshi men by age and social class

Social Class	Year of Birth	No of Bangladeshis	Caucasian smoking rate (%)	No of Bangladeshi smokers	
				Expected*	Observed
I	1932-49	0	50.0	0	0
	1914-31	1	33.3	0.33	1
II	1932-49	0	25.0	0	0
	1914-31	5	25.0	1.25	3
IIIa	1932-49	2	43.5	0.87	2
	1914-31	7	37.5	2.63	2
IIIb	1932-49	9	24.1	2.17	8
	1914-31	8	57.1	4.59	6
IV	1932-49	21	42.9	9.01	16
	1914-31	23	55.6	12.79	17
V	1932-49	3	40.0	1.20	2
	1914-31	6	80.0	4.80	6
Unemployed	1932-49	13	55.6	7.23	9
	1914-31	18	66.7	12.00	16
Total		116	43.1	58.87	88

*If group had same smoking rate as that of Caucasians

Table 2 Dietary intake of Bangladeshi men studied

Nutrient	Mean intake	SD	Range	Estimated UK daily consumption
Total energy (kcal)	3391	511.3	2562-4096	2180
Total fat (g)	215.5	49.2	148.6-294.8	103
Total protein (g)	55.5	9.6	42.6-68.4	70
Total carbohydrate (g)	327.0	65.9	244.2-479.5	258
%Energy from fat	56.7	6.7	44.5-65.0	43.9
P:S ratio	0.46	0.17	0.26-0.74	0.27

Source: National Food Survey 1982

(range 44.5-65.0, median 56.0). Interestingly, the polyunsaturated:saturated fatty acid ratio (P:S) was high at 0.46 (range 0.26-0.74, median 0.50). The major sources of dietary fat were non dairy with 38% from vegetable oil (the major variety used was a mixture of rapeseed and soyabean) and 48% from meat, which was invariably lamb, especially at the midday meal. Conversely, less than 5% came from dairy sources. The diet is mainly rice based though western style breakfast cereals were taken by the majority. There was little self reported daily variation in diet, meat curry made with large quantities of vegetable oil occupying the two main meals. Frequently the same curry was consumed on successive days.

There were no comparable data from this study for Caucasians, but the estimated national daily consumption is shown in table 2. In addition to the high fat intake the Bangladeshis have a higher carbohydrate intake (and thus, not surprisingly, a higher total energy intake) than the national average though the latter data excluded food consumed away from home.

Discussion

There were two major findings in these Bangladeshi men which might be of relevance in explaining their high risk of ischaemic heart disease. Firstly, there was a very high proportion of smokers, approximately twice the national male rate³ and 50% higher than for a similar Caucasian population adjusted for age and social class. Secondly, their average daily fat intake appeared to be approximately double that expected, based on population data.⁹

It was unlikely that the smoking interview overestimated the number of smokers; indeed, the suspicion is that many of the self reported Bangladeshi non-smokers were giving false answers as judged by nicotine staining and other signs. The high smoking rate of Bangladeshis in Bangladesh has also been recently highlighted,^{10 11} the rate of current smokers being identical with that found in this study of migrants. In Bangladesh, in addition to the normal

health consequences of smoking, the economic cost of maintaining the habit leads to under nutrition.¹⁰

The diet enquiry was conducted on only a small number, selected for their cooperation. It is likely that, as these participants spoke reasonable English, they were more "westernised" than those not studied. Thus the consequence of this selection bias would be to mask any differences between the Bangladeshis and the indigenous diet, and thus the true difference in diet may be even greater. We were struck, however, by the general similarity of the diets of those interviewed, and interrogation of community leaders and local grocers confirmed these impressions. It seems likely that the major dietary findings are generally applicable. The method of dietary enquiry used, that is, direct observation and weighing of both raw ingredients and actual food consumed (after subtracting wastage), is little used because of the high costs and cooperation needed. Nevertheless, this "precise weighting method" probably has the greatest validity of any dietary survey methods.¹² However, the intrusive nature of the diet survey method used militates against its being applied to a random sample. Thus it is reasonable to compare the diet of the Bangladeshis studied with an estimate, albeit poor, of the national diet rather than with a non random sample of the local Caucasian population.

The very high mean fat intake of over 200 g recorded in the study is double the current average daily consumption in the UK,⁹ and a reduction of the latter by 25% has recently been recommended.¹³ Thus, based on even the most cautious interpretation of dietary fat and heart disease link, this level of consumption in the Bangladeshis is undesirable. The P:S ratio of 0.46 in the Bangladeshis compares with the current national average of 0.27 and is close to the recommended goal of 0.54.¹⁴ Nevertheless, these results perhaps argue that total fat intake should be the major concern rather than the P:S ratio as has previously been suggested.¹⁵ An alternative explanation is that the P:S ratio is irrelevant in the face of the extremely high fat intake observed in the group we have studied.

It has been noted before that migrants from the Indian subcontinent, wherever they settle, have a higher rate of ischaemic heart disease than the indigenous population.¹⁶ A recent study of such migrants to Trinidad reported a significantly lower high-density-lipoprotein and a significantly higher low-density-lipoprotein cholesterol compared with that of individuals of African origin which the authors argued might be a result of both genetic and cultural factors. They argued for a dietary study to investigate their relative roles.

Bangladeshi men in the East End of London are therefore not only at increased risk of ischaemic heart disease but, in their life style, exhibit the two major potentially reversible risk factors. The challenge for health education and community workers is to exploit this potential.

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