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Survival after acute myocardial infarction in Asian and white patients in Birmingham

H T Mukhtar, W A Littler

Abstract

***Objective*—To compare outcome after infarction in South Asian patients, comprising Indians, Pakistanis, Bangladeshis and individuals of East African origin, in Birmingham with that in white patients in the same city.**

***Design*—A prospective case-control study.**

***Setting*—Three large district general hospitals.**

***Patients*—102 South Asian patients discharged from hospital after an acute myocardial infarction were matched for age, sex, time and season of infarct, and hospital of admission with white patients.**

***Main outcome measures*—Survival and complication.**

***Results*—There was no significant difference in survival or complications during the four years after an acute myocardial infarction in South Asian and white patients.**

***Conclusion*—The survival and clinical course of South Asian and white patients discharged after an acute myocardial infarction were similar over a four year period.**

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Keywords: acute myocardial infarction; ethnic origin; survival after original infarct.

There are over 11 million South Asians throughout the world who trace their ethnic origin to the Indian subcontinent.[1] Although of heterogeneous genetic composition, available data suggest that most share a high mortality from ischaemic heart disease.[2] As opposed to that in many other countries, the South Asian population of Britain mainly comprises first generation immigrants who arrived mostly after 1960. According to the 1981 census, the majority of South Asians living in Birmingham come from India (45%) and Pakistan (42·4%), whereas the remainder originate from Bangladesh or East Africa.[3] Like other South Asians in Britain, most are in a relatively younger age group, a very much smaller proportion of their population is above the age of 30 years compared with that of whites.

Reports from all over the world indicate a high mortality from ischaemic heart disease in South Asian immigrants. Marmot *et al*[4] demonstrated that the standardised mortality ratio for ischaemic heart disease was the highest among adults born in the Indian subcontinent (119 in men, 128 in women) when the standardised mortality ratio of adults born in England and Wales was taken as 100.

One of us (WAL) has previously demonstrated that there was no significant difference in clinical presentation or early complications after myocardial infarction between Asians and whites in Birmingham.[5] In a further study, one of us (WAL) confirmed a high incidence of coronary events requiring hospital admission in South Asians living in Birmingham.[6] The admission rate to hospital with confirmed myocardial infarction or myocardial ischaemia among Asian men in Birmingham was higher than that of the indigenous white population. The single major difference in risk factors was the high prevalence of diabetes mellitus in all Asian groups.

The main purpose of the present study was to determine the mortality and morbidity after myocardial infarction in South Asians and whites in Birmingham.

Patients and methods

The basis of this study was our previous work on admission rates of patients with suspected myocardial infarction in Birmingham.[6] All patients of South Asian ethnic origin aged 69 or less who were admitted with chest pain to the coronary care units of five hospitals in Birmingham between 1 July 1986 and 30 June 1987 were documented. Those patients who had a confirmed myocardial infarction (serial electrocardiographic changes with characteristic increase and decrease of cardiac enzymes) and who were discharged alive from the hospital were followed prospectively. The study concentrated on those South Asian patients in three of the five hospitals, as a total of only seven patients were discharged from the two remaining hospitals.

Some 111 patients were identified from the three hospitals, 90% of whom were male. The majority of patients (45·6%) were of Pakistani origin, with 36% of Indian and 15·2% of Bangladeshi origins.

All South Asian patients were matched for age and sex with white patients, who were admitted to the same hospital during the same period of time and discharged alive with a confirmed diagnosis of acute myocardial infarction. The mean (SD) age of the South Asian patients was 54 (8·56) years compared with 53·9 (8·47) years of the whites. Details of age, sex, occupation, address, ethnic origin, risk factors, and past medical history were

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Table 1 Risk factors for coronary artery disease in ethnic groups with confirmed myocardial infarction

	Asian patients (102)	*White patients (102)*
Hypertension	34	22
Smoking	49	70
Diabetes mellitus	22	13
Obsesity (kg m^2)	24·9	27·02
Cholesterol (mmol/l)	6·43	6·7
Triglycerides (mmol/l)	2·54	2·18

recorded on the original admission and confirmed before discharge.

All patients were managed clinically in the usual way by their respective physicians and general practitioners. The coronary care policies of the three hospitals did not differ in any major aspect. Routine management of patients in these units during the period of study (July 1986–June 1987) did not include thrombolysis. A similar proportion of Asians (n = 15) and whites (n = 16) were included in the AIMS and ISIS II trials, with an equal proportion receiving active and placebo treatments. These patients did not influence the overall outcome.

There was no significant difference between the two groups with regard to the main risk factors for coronary artery disease (table 1).

Patients with a confirmed myocardial infarction were invited for a follow-up interview 18 months after the original infarct. They were advised to bring their medications. Interviews were conducted by one individual (HM) in the same hospital in which the patients had originally been admitted. A full medical history and clinical examination were undertaken at the interview and current medications inspected and noted.

Patients who were unable to attend on first invitation were reminded by repeated letters and telephone calls if necessary. Patients who had moved from their previous addresses were traced through their general practitioners. In cases of difficulty in finding a patient who had moved from their address, the Family Practitioners Committee was contacted for the name of their new doctor. Information about those patients who had moved abroad or to another city were obtained by contacting their relatives or friends in Birmingham. Thirteen South Asian patients were traced by this means. Despite such efforts four South Asian patients could not be traced.

Some 75 South Asian patients and 69 white patients were successfully interviewed by HM.

Information as to whether patients were alive or dead was obtained from their general practitioners during November/December 1989, 1990, and 1991. Information about the cause and mode of death was also obtained. Patients who had changed their general practitioners were traced through the General Practitioners Committee. Patients whose status (alive or otherwise) could not be assured by these means were directly contacted by telephone, letter, or in some cases by direct visit. Information on those who had moved abroad was obtained by contacting their relatives or friends.

In some cases, it was not possible to establish the precise aetiology, especially when the patient had died abroad. An attempt was made, however, to identify the cause of death by enquiring of friends or relatives as to whether or not the death had been sudden.

Statistical comparisons between the two groups on continuous variables was undertaken using unpaired *t* tests and a two tailed probability using separate variances. Discrete variables were compared using χ^2 tests in a fourfold contingency table. Subgroup analysis and continuous variables were performed by analysis of variants.

Table 2 Baseline data of Asian and white patients admitted to three Birmingham hospitals in a 12 month period between 1986 and 1987

	Hospital			
	1	*2*	*3*	*Total*
Asian patients				
Patients surviving myocardial infarction	37	36	38	111
Deaths from myocardial infarction	4	3	7	14 (13%)
White patients				
Patients surviving myocardial infarction	116	85	258	459
Deaths from myocardial infarction	34	17	33	84 (18%)

Table 3 Baseline data of matched Asian and white patients

	Asian patients (n = 102)	*White patients (n = 102)*
Q wave infarct	81	74
Non-Q wave infarct	21	28
Anterior	45	49
Inferior	42	48
Lateral	3	7
Other	11	8
Ventricular tachyarrhythmia/ ventricular fibrillation	13	17*
Pulmonary oedema	30	26
Uncomplicated	59	71
Diabetes mellitus	24	15
Hypertension	33	27
Diabetes hypertension	8	3
Duration of hospitalisation (days)	10·6	10·1

*P < 0·05.

Table 4 Clinical data of Asian and white patients 18 months after original infarct

	Asian patients (n = 102)	*White patients (n = 102)*
Alive	85	91
Dead	12	10
Sudden death	7	7
Cardiac death	4	3
Non-cardiac death	1	0
One or more readmissions	34	32
Myocardial infarction	6	10
Heart failure	7	5
Under regular review	25	44*
Coronary angiography	28	24
Coronary artery bypass grafting	6	1
Percutaneous transluminal coronary angioplasty	1	4

*P < 0·05.

Results

Table 2 gives the baseline data for the initial acute myocardial infarction. There was no significant difference in the inhospital death rates from myocardial infarction between the two groups.

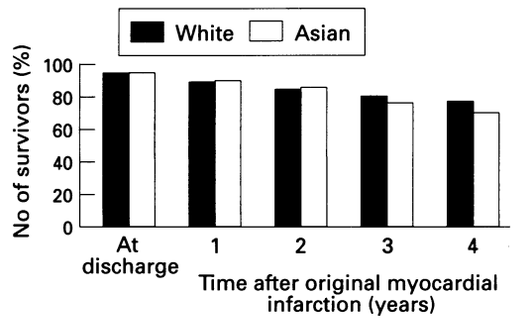
Table 3 documents the essential information concerning the initial admission for an acute myocardial infarction in Asians and whites. The Asian patients were matched for

Table 5 Drug treatment in Asian and white patients 18 months after myocardial infarction

	Asian patients	*White patients*
Antianginal	56	51
Diuretics	23	26
ACE inhibitors	1	2
Antiarrhythmics	1	2
Aspirin	9	10

ACE, angiotensin converting enzyme.

Cumulative survival of white and Asian patients after acute myocardial infarction.



age and sex with whites admitted to the same hospital, at the same time of year, and at the same time of day. The only significant difference was an excess of ventricular arrhythmia in the white population.

Table 4 lists the information obtained from each patient 18 months after the original infarct. There were significantly more white patients under regular review at the outpatient clinic of their local hospital.

There was no difference in the range of cardiac drugs taken by the Asian and white patients in the follow up period (table 4).

There was no significant difference in cumulative survival over the four successive years after discharge from an acute myocardial infarct in Asian and white patients (figure).

Discussion

There was no significant difference in mortality during the acute myocardial infarction and over the subsequent four years between the two ethnic groups.

Deaths during acute myocardial infarction confirm our previous observation in one of the hospitals (hospital 3).[5] It is interesting that in the previous study there was also a trend towards more deaths in the white population. In our previous study, ventricular arrhythmia was statistically more common in the Asian group, whereas in the present study the converse applies. Both observations could simply be chance findings.

We were of the view before the study started that South Asian patients were likely to have a more "malignant" course after myocardial infarction than whites. This has clearly not been borne out. The standard of care given to both groups is unlikely to have differed widely, although more white patients were under regular review at an outpatient clinic. This might reflect our general observation that Asian patients are more likely to default an outpatient appointment than whites. Drug treatment in the two groups was the same (table 5).

The number of revascularisation procedures recorded at the 18 month review was similar in both groups. We have no accurate information as to whether any interventions were undertaken in the subsequent years. From our experience we doubt whether an excess of such procedures in the Asian population could have led to bias in our results.

Our previous observations indicated that the admission rate to hospital for confirmed myocardial infarction or myocardial ischaemia among South Asian men in Birmingham was higher than in the indigenous white population.[6] The present study confirms our previous observations that inhospital mortality during myocardial infarction is no greater in the Asian population and that the overall complication rate of myocardial infarction is similar. The present study indicates that subsequent mortality and morbidity over a four year period after an acute myocardial infarction is similar in each group.

These observations lend weight to our view that there is no intrinsic difference in either the pathology or clinical findings of coronary artery disease in South Asians and whites in Birmingham.

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