

ETHNICITY

Ethnic variations in the management of patients with acute stroke

J Bourke, R Sylvester, P Sharma

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See end of article for authors' affiliations

Correspondence to:
Dr P Sharma, Department
of Clinical Neuroscience,
Hammersmith Hospitals
Acute Stroke Unit, Imperial
College, Fulham Palace
Road, London W6 8RF,
UK; psharma@imperial.
ac.uk

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Background: There is increasing interest in the management of stroke in ethnic minorities but few studies have considered this issue. This study investigated if differences in acute stroke management exist between a white European and Bangladeshi populations living in London, England.

Methods: All stroke surviving patients discharged over a five year period in a major London teaching hospital based in an ethnically diverse area of inner city London were recruited. Cerebrovascular risk factors, their management, and investigation for acute stroke syndromes were recorded and comparison between white and Bangladeshi cohorts was made. Categorical data were analysed using Fisher's exact test.

Results: Measurement of cholesterol concentrations are undertaken less often in those from a Bangladeshi background (25%) compared with white Europeans (76%) ($p < 0.0001$). Statin therapy tends to be given less often to Bangladeshis. However, neuroimaging ($p < 0.05$) and echocardiography ($p < 0.0001$) is performed more often in Bangladeshis compared with white Europeans.

Conclusion: There are variations in the management of acute stroke because of ethnicity and these variations could have substantial consequences on secondary rates of cerebrovascular and cardiovascular disease. Whether the reasons for this disparity are attributable to inequity or iniquity of care need to be further investigated perhaps along with the development of ethnicity specific protocols. Overall the management of stroke and its risk factors in either racial group remains lamentable.

Stroke is the principal cause of disability, the second most frequent cause of dementia, and the third commonest cause of death in the West.¹ These statistics hide the true disparity of stroke and its management in an increasingly multicultural society. Even among South Asians where the standardised mortality ratio for cerebrovascular disease is higher than for the entirety of the England/Wales white European population,² male Bangladeshis suffer from a greater risk of cardiovascular disease compared with others from the Indian subcontinent.³

The UK national clinical guidelines for stroke,⁴ aim to provide a framework for optimum standardised care for all patients after stroke. However, the guidelines do not take into account the variability of risk factors, both physiological and cultural, for people from different ethnic backgrounds and how they might have an impact on the care of such people after stroke. Indeed, to the best of our knowledge, little work has been done on the management of stroke in patients from ethnic minorities,^{5–9} particularly the South Asian community where cardiovascular disease is highly prevalent.^{10–12}

We aimed to discover if the management of stroke was in any way different among the high risk UK Bangladeshi cohort compared with UK white Europeans. As far as we are aware this is the first study to examine ethnic differences of stroke management in a hospital setting between these two common groups.

METHODS

A single large teaching hospital based in the inner city with a dense surrounding multicultural population was purposely chosen. The Royal London Hospital, one of the largest hospital trusts in the UK with over 1100 beds serving a catchment population of around 500 000 people, was chosen as a suitable centre for study. All patients from the UK Bangladeshi and white (English, Scottish, Welsh) communities with a diagnosis at discharge of ischaemic stroke over a

five year period (1997–2002) were recruited. Deaths from any cause were excluded. Although a stroke unit exists at this site we did not specify admission to that unit as part of the inclusion criteria.

Demographic details of age, sex, and self reported ethnicity¹³ were recorded as were comorbidity, other vascular risk factors, and discharge outcomes. Stroke was classified according to the Oxford Community subclassification system.¹⁴ Type of investigations undertaken, surgical treatment, and record of drugs on discharge were also noted. Categorical data were analysed using Fisher's exact test. A $p < 0.05$ was taken as significant throughout.

RESULTS

A total of 265 patients met the inclusion criteria with 186 of white (English, Scottish, or Welsh; mean age of stroke onset 66 years) and the remainder of Bangladeshi ancestry (mean age of stroke onset 62 years). About 60% of stroke patients are treated in the stroke unit, although we did not analyse data separately for that group.

A greater proportion of men from the Bangladeshi community suffered a stroke compared with white men. There were few differences in the frequency of ischaemic stroke between the two groups (89% white, 86% Bangladeshi), although haemorrhagic stroke was twice as common in the white cohort (9% compared with 4% in the Bangladeshi). There were no statistically significant differences in vascular risk factors of angina or cardiovascular disease history between the two groups, although diabetes was more common and ECG or echo diagnosed atrial fibrillation less common in Bangladeshis compared with white subjects (table 1). There were no significant differences in the various types of ischaemic stroke between the two groups (table 2).

Measurement of total cholesterol concentrations was much more likely to be performed in white Europeans (76%)

Table 1 Differences in stroke between UK white European and UK Bangladeshi populations

	European n = 186 (%)	Bangladeshi n = 79 (%)
Male	105 (56)	57 (72)*
Ischaemic/haemorrhagic	165/9 (89/5)	68/3 (86/4)
Previous CVD‡	117 (63)	38 (48)
Hypertensive	111 (60)	50 (63)
Diabetic	20 (11)	40 (51)†
Atrial fibrillation	25 (13)	3 (4)*
Smoker	68 (37)	32 (41)
CT/MRI brain imaging	129 (69)	65 (82)*
MRA ± Doppler imaging	42 (23)	10 (13)
Echocardiography	69 (37)	60 (76)†
Cholesterol measurement	141 (76)	20 (25)†
Antiplatelet therapy	129 (69)	60 (76)
Statin therapy	67 (36)	23 (29)

‡Previous angina, stroke, coronary artery bypass, peripheral vascular disease, myocardial infarction, or congestive cardiac disease. *p<0.05; †p<0.0001.

compared with Bangladeshi (25%). Although neuroimaging (CT/MRI) and echocardiography were more likely to be performed in the Bangladeshi cohort compared with Europeans, there were no differences in undertaking carotid imaging (MRA and/or Doppler studies). There were no significant differences in either rehabilitation referral patterns or intervention for carotid endarterectomy (data not shown).

Only 34% of all patients were discharged taking a lipid lowering drug (36% white; 29% Bangladeshi). White Europeans were more likely to be given warfarin (8%) compared with Bangladeshi (1.3%), which may be explained by the greater incidence of atrial fibrillation in that group.

DISCUSSION

This study was designed to investigate differences between the management of stroke patients in UK white Europeans compared with those from Bangladeshi background. Our findings show that differences exist in management of stroke and its risk factors. Simple measurements such as total cholesterol, important for risk factor profiling, were not only less likely to be undertaken in Bangladeshi but statin therapy was 7% less likely to be started compared with white patients, although the latter did not reach statistical significance. We would suggest however, the overall management of stroke in both groups is lamentable.

A similar study in acute myocardial infarction has previously noted discrepancy of treatments received between white groups and Bangladeshi.¹⁵ These investigators found that despite the time between onset of symptoms and presentation being similar between the two groups Bangladeshi were less likely to promptly receive thrombolysis, although the reasons may be attributable to atypical presentation. Our study mirrors a similar imbalance in the investigation and management of stroke. It would seem from

our study that known incidences of risk factors of at-risk groups are not being used appropriately.¹⁶

The fact that some investigations (neuroimaging and echocardiography) were performed more often in the Bangladeshi population may be the result of several explanations. Firstly, physicians may be more likely to perform investigations in the absence of a reasonably reliable history. Certainly, the difficulty in using or even obtaining interpreters has been well reported.¹⁷ Secondly, it is possible that clinicians are more suspicious of rarer causes of focal neurological deficits in those from ethnic minorities. Notwithstanding either of these explanations, the fact that only 73% of the entire cohort presenting with stroke were imaged is at odds with current recommendations⁴ and previous clinical guidelines.¹⁹

Nearly two thirds of our total stroke cohort was under the age of 70 years (mean age of onset 62 years in Bangladeshi and 66 years in Europeans). Although the definition of young stroke varies, the consensus view is that such patients should be extensively investigated.²⁰ Neither cohort was investigated to such an extent (for example, neuroimaging or cholesterol measurement) nor adequately treated with statin (33%) or antiplatelet (75%) therapy despite the considerable supporting body of evidence. The overall management of stroke remains poor. There was no observed diagnostic difference in hypertension but diabetes was, as predicted, more prevalent in the Bangladeshi cohort (table 1) and there was a trend for increase in ischaemic heart disease in Bangladeshi, consistent with other studies.³

Few studies addressing the question of ethnicity and stroke exist. Previous studies have focused on Afro-Caribbean groups and comparison with their white counterparts.^{6,9} Although ethnic comparisons in mortality rates exist,^{7,11} to the best of our knowledge only one study⁸ has been conducted in the UK that has examined trends involving stroke management in groups from the Indian subcontinent. Their important finding was that South Asian stroke patients were not admitted acutely to hospital compared with their white counterparts. The study similar to many involving ethnicity, made no attempt to further sub-define the South Asian population. This paucity of definition is important because of emerging data that subgroups within the South Asian population, for example, Bangladeshi, have differing risk profile in terms of vascular disease compared with other Asians.³

There are a number of limitations to this study that should be noted. We decided to look at patients who were eventually discharged from hospital. Patients who died in hospital were excluded on the basis that they would not allow us to

Table 2 Ischaemic stroke frequency by arterial classification

	European (169)*	Bangladeshi (69)*
TACS	29	6
PACS	78	38
POCS	19	9
LACS	43	16

*Numbers in whom classification was possible.¹⁴ p>0.05 across all groups. TACS, total anterior circulation stroke; PACS, partial anterior circulation stroke; POCS, posterior circulation stroke; LACS, lacunar anterior circulation stroke.

determine how the overall management of stroke from admission, medical, surgical, and pharmacological management through to discharge varied depending on ethnicity. This may have biased our results in terms of stroke management if ethnicity was ultimately pertinent towards the cause of death. The ethnicity coding system used was self reported but previous studies have shown this to be a reliable means of determining ethnicity.¹³ We chose to study only one centre and extrapolating our results nationwide may be presumptive. However, the centre chosen is one of the largest trusts in the UK and its doctors regularly rotate through numerous other hospitals within and out of London. Thus, their management experience in totality of their training is being measured. Moreover, the greatest concentration of the Bangladeshi community is within London and around this particular trust (<http://www.statistics.gov.uk/lib/Section192.html>). The number of subjects in this study is not as large as perhaps would be expected given the serving catchment area (about 196 000). However, the 2001 UK census data show that this area consists of a young population (average age 31 years). Indeed, only around 11% of the population is over 60 years of age (<http://neighbourhood.statistics.gov.uk/areaprofileframes.asp?T=A&AID=176458&TID=1&PC=e1%202ad>) and thus the expected number of stroke cases would therefore be considerably fewer than may have been initially predicted. Intervention with statin therapy was poor in either cohort. Our study was conducted before the publication of the heart protection study,²¹ which demonstrated a 25% reduction in first event stroke in those prescribed simvastatin. It is therefore possible that treatment with statin therapy in our cohort was not well accepted at the time of this study. Notwithstanding this caveat, many neurovascular physicians were advocating the aggressive management of hypercholesterolaemia even at that time.

Finally, we did not seek to investigate the reasons for the failure of exemplary stroke management in Bangladeshis. The reasons are probably diverse and are likely to include lack of translational facilities, an important factor well recognised by previous studies,¹⁷ late presentation of disease, differences in case mix, and cultural misunderstanding rather than wilful differential treatment.

We have found disparities in management between ethnic groups. Our data suggest that the management of stroke in a comparatively young Bangladeshi cohort is not ideal. Furthermore, it would seem that where data do exist to guide ethnicity specific management of stroke it is not used appropriately. In a society that is increasingly multicultural these findings highlight a potential problem in applying standardised protocols based upon the indigenous population to local ethnic communities. A further study investigating the underlying reasons for the differences found would be useful. Clearly such a study would be better placed to ask whether our findings were a result of inequity or iniquity of care. Our study suggests clinical stroke practice across all patient groups is lamentable.

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Authors' affiliations

J Bourke, R Sylvester, The Royal London Hospital, UK
P Sharma, Hammersmith Hospitals Acute Stroke Unit (HHASU), Imperial College, London, UK

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