CEREBROVASCULAR ACCIDENTS in hypertensive subjects may be due to cerebral hemorrhage or infarction. Cerebral hemorrhage is almost always associated with elevated arterial blood pressure except in those with primary haematological disorders. It is believed to be due to rupture of Charcot Bouchard aneurysms which are only common in hypertensive individuals and match in distribution the sites of major hemorrhage.

Cerebral infarction is also more common in hypertensive subjects. The prospective data from the Framingham Survey show that hypertension is the most important risk factor for the development of "atherothrombotic brain infarction" (by which was meant stroke with no blood-staining of the cerebrospinal fluid). This is partly due to small deep lacunar infarcts occurring in hypertensive subjects as a consequence of lipohyalinosis of small perforating arteries exposed to chronically elevated blood pressure. However, large infarcts, as encountered in most non-haemorrhagic strokes are also associated with hypertension and this has traditionally been attributed to an increase in the prevalence or severity of atheroma in the presence of high blood pressure.

We have investigated this hypothesis by examining the carotid bifurcation on angiograms not performed for cerebrovascular disease but for cerebral tumour to find whether evidence of vessel wall disease is related to the patient's blood pressure.

Methods

Patients undergoing angiography for investigation of cerebral tumour at the National Hospitals Queen Square and Maida Vale, and at The Middlesex Hospital were considered. The prevailing blood pressure on admission was extracted from the case notes and therefore represents a single "casual" reading. The mean arterial blood pressure was also calculated. The patients' sex and age were also noted.

The angiograms were reviewed by one or both authors and the neck films studied. A decision was taken as to whether they showed any evidence of irregularity of the vessel wall likely to represent the effect of atheromatous change. The blood pressure levels were unknown at the time of the reading of the angiograms.
extensive in the presence of hypertension.\textsuperscript{10, 11} Carotid occlusion or embolism of atheromatous or thrombotic material from the internal carotid artery are frequent causes of stroke and visual loss.\textsuperscript{12} Potentiation of carotid atheroma by hypertension would be expected to increase the risk of strokes. The present angiographic data, however, reveal only a small influence of hypertension on carotid artery disease. Human post-mortem data also showed only a small increase in aortic atheroma attributable to hypertension.\textsuperscript{13} If stroke victims rather than patients with no symptoms of cerebro-vascular disease are considered, there is still little evidence of increased neck vessel disease in the presence of hypertension.\textsuperscript{14-16}

If the effect of hypertension on carotid artery disease is small, what is the explanation of the link with non-atherosclerotic stroke? One factor is undoubtedly the occurrence of small deep lacunar infarcts related to small vessel change.\textsuperscript{6} Another factor may be the effect of blood pressure on atheroma of intracranial vessels which has been demonstrated at autopsy,\textsuperscript{11, 17, 18} but did not appear to account for intracranial angiographic abnormalities in patients with multi-infarct dementia.\textsuperscript{19} Other possibilities are that hypertension increases stroke risk through an effect on cardiac function or on the tendency to thrombus formation. Hypertension might play a causal role in triggering thrombosis in diseased vessels by increasing the risk of intramural hemorrhage.\textsuperscript{20}

It is noteworthy in passing that only 7 of the 269 patients had carotid stenosis. This highlights the pathological significance of stenosis in patients with transient cerebral ischaemic attacks where it is found in 40 to 50\%.\textsuperscript{21, 22}

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