PAPERS AND ORIGINALS

Subarachnoid haemorrhage above the age of 59: Are intracranial investigations justified?

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Summary and conclusions

Out of 186 patients aged over 59 referred to a neurosurgical department after spontaneous subarachnoid haemorrhage, 143 underwent cerebral angiography; only 28 (15%) of the patients had surgery, of whom 16 were independent one year later.

The doubtful benefit of surgery and the small proportion of patients who underwent surgery have economic and ethical implications; in particular, neurosurgical beds and neuroradiological facilities should not be occupied by such patients if this delays the admission of younger patients and those requiring investigation of intracranial space-occupying and spinal lesions.

Introduction

With the limitation of funds available for financing health services it is becoming increasingly important that scarce and expensive resources should be used only when appreciable benefit to patients is likely to result. The utilisation of such resources for elderly patients when finance for more basic requirements in this age group is often lacking prompted us to review the experience of a neurosurgical unit in dealing with elderly patients who had suffered a subarachnoid haemorrhage.

Accepting that the object of referral is to establish or exclude the need for intracranial surgery, we sought to answer three questions: What is the likelihood of referral leading to cerebral angiography? What is the likelihood of referral leading to surgery? and What is the likelihood of such surgery improving prognosis?

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Patients and methods

All patients aged over 59 admitted to the Wessex Neurological Centre between 1965 and 1975 with a primary diagnosis of subarachnoid haemorrhage were reviewed. The centre serves a regional population of about 2.4 million. Patients with suspected subarachnoid haemorrhage are initially admitted to their local hospitals and are subsequently referred to the centre if they need further investigation. The decision to transfer follows discussion between the referring physician or his team and a member of the neurosurgical staff; hence the patients transferred are a selected group.

Patients whose diagnosis was in doubt or not made until after admission to the centre were excluded from the survey. In 93.6% of cases a confirmatory lumbar puncture was recorded in the case notes. One hundred and eighty-six patients (58 men and 128 women) aged 60-78 years fulfilled the criteria for inclusion. Nine were over 70.

Results

Investigations—Bilateral carotid angiography was performed on 141 patients, and unilateral carotid angiography on two. Eleven patients had vertebral angiography in addition to bilateral carotid angiography. Angiography was not done in 43 cases owing to deterioration in level of consciousness, high or labile blood pressure, and failure to withstand common carotid artery compression. Angiography showed the lesion responsible for the haemorrhage in 97 patients (table I).

Surgical management—Twenty-eight of the 186 patients (15%) underwent surgery between five and 39 (average 13) days after haemorrhage (table II). The criterion for independence was that patients could care for themselves at home without help. Of the 28 patients subjected to operation, 16 were mentally and neurologically intact on admission, but only nine of these were capable of being

TABLE I—Lesions responsible for haemorrhage (shown by angiography)

	No of patients
Posterior communicating or internal carotid aneurysm	32
Middle cerebral aneurysm	16
Anterior communicating or anterior cerebral aneurysm	24
Multiple aneurysms	18
Arteriovenous malformation	3
Solitary intracerebral haematoma	4
Total	97

independent one year later. Six patients died in the early postoperative period after neurological deterioration—three after common carotid artery ligation, and three after intracranial surgery. One patient died of recurrent haemorrhage from an anterior communicating artery aneurysm (which was not occluded at operation), and one died 30 months after removal of an intracranial haematoma, having never left hospital.

TABLE II—Results of surgical and conservative management

	Surgical			Conservative		
	Total	Alive	Independent at 1 year	Total	Alive	Independent at 1 year
Middle cerebral aneurysm . .	8	7	6	8	4	2
Posterior communicating artery aneurysm	17	12	9	18	5	4
Anterior communicating artery aneurysm	1	0	0	23	18	15
Arteriovenous malformation . .	1	1	1	2	1	1
Intracerebral haematoma . .	1	1	0	3	3	3
Total	28	21	16	54	31	25

Conservative management—Of the 97 patients whose lesions were defined angiographically, 69 were managed conservatively. Reasons for this included adverse configuration and site of aneurysm—for example, anterior communicating artery—multiplicity of aneurysms, and, above all, unfavourable mental, neurological, or cardiovascular state. With the exclusion of ocular palsies, which were not considered to be adverse neurological factors, 58 (84%) of the 69 conservatively managed patients had some mental or neurological deficit on admission. Follow-up of these 58 patients showed that one year later 22 (38%) were leading an independent life, whereas of the 11 who did not have such deficits on admission, 7 (64%) were independent one year later.

Discussion

The diagnosis of subarachnoid haemorrhage is rarely a problem and can be readily confirmed by lumbar puncture in any medical ward. Management thereafter, however, remains controversial. Although the mortality from subarachnoid haemorrhage is greater in the elderly,^{1,2} there have not been any large series of case reports assessing the place of surgery in this age group. We have recorded the management and subsequent course of a large group of selected patients over the age of 59 admitted to a regional neurosurgical unit over 10 years. Before reaching the neurosurgical department the patients had already been subjected to considerable selection based on factors other than age. Thus patients with sustained hypertension, ischaemic heart disease, or chronic or acute respiratory disease and those whose level of consciousness remained low after the haemorrhage were usually not admitted for intracranial investigation. Despite these criteria, 43 patients (23%) were admitted and then considered on clinical grounds to be unfit for surgery whatever the nature of the intracranial lesion. They did not undergo angiography, and therefore they and their relatives could have been spared the disturbance of unnecessary transfer, often over a long distance. This would also have freed neurosurgical beds for other, more necessary admissions.

Angiography did not show any abnormality relevant to the haemorrhage in 46 of the 143 patients so examined—that is, 32% of those examined and 25% of the patients admitted to the neurosurgical department. Despite selection before transfer and again before angiography, only 28 of the 97 patients in whom a lesion was found underwent surgery—that is, 15% of the 186 patients admitted and 20% of the 143 examined by angiography (fig).

The extent to which surgery improves prognosis in patients over 60 is difficult to assess. We were unable to draw conclusions about the place of surgery for arteriovenous malformation and intracerebral haematoma because the numbers were too small (table II). Patients with anterior communicating artery

Management and outcome of subarachnoid haemorrhage in 186 patients aged 60 and over admitted to neurosurgical unit.

aneurysm fared well without surgery, but there was no surgical group for comparison. Surgery for posterior communicating artery aneurysm (common carotid artery ligation in 12 cases, clipping of aneurysm in five) and middle cerebral aneurysm appeared to give better results than did conservative management. This apparent advantage, however, may have been due entirely to preoperative selection, since only 12 (43%) of the patients undergoing surgery had significant preoperative mental or neurological deficits compared with 58 (84%) of the patients managed conservatively. Furthermore, of patients with causal lesions who were neurologically and mentally well on admission, 7 (64%) of the 11 managed conservatively and 9 (56%) of the 16 managed surgically were well one year later.

The problem for the referring physician and general practitioner is therefore considerable, because factors employed in selection cast doubt on the overall value of surgery; of the 97 patients whose angiograms showed a relevant lesion, 16 were alive and independent one year after surgery, whereas 29 were well without surgery. Computerised axial tomography has become of increasing value in the management of patients after intracranial haemorrhage and may help to identify those with lesions needing surgery. Angiography, however, is still necessary for the final demonstration of the lesion and before a final decision about surgery can be taken.

Whether advanced age, likelihood of favourable outcome, and economics should be taken into account when deciding on management for an individual patient are questions that are part ethical and part pragmatic, and are rarely welcomed by the medical profession. There is a tendency to underrate the distress and anxiety caused by transfer to a neurosurgical department; this should not be dismissed, particularly before embarking on investigations that are hardly justified if there is only a very small chance of benefit accruing from any particular form of treatment and which may be hazardous in the elderly. Although computerised axial tomography (EMI scan) has become of increasing value in the management of intracranial haemorrhage, its immediate availability remains limited, not only due to lack of apparatus but also due to heavy demands on such facilities, and the position is not likely to improve in the existing financial climate.

This retrospective survey has shown that despite careful selection the returns from neurosurgical referrals of patients of 60 years or more who had sustained a spontaneous intracranial haemorrhage were very small. At a time of financial stringency in the face of increasing demands for advanced and expensive investigations, our figures suggest that neurosurgical beds and neuroradiological facilities should not be occupied by such patients, particularly if this delays the admission of younger patients and those requiring investigation of intracranial space-occupying and spinal lesions.

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References

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