may be excellent secondary outcome measures, as they provide a meaningful measure of motor dysfunction for acts of daily living.

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Subarachnoid haemorrhage

Subarachnoid haemorrhage in patients ≥ 75 years: clinical course, treatment and outcome

M F Oertel, W Scharbrodt

In most Western societies, the percentage of patients ≥ 60 years has been increasing over the past century. This has become a challenge both economically and socially. Medical science, which initially increased life expectancy, now faces the task of predicting outcome early in an unexpected disease such as subarachnoid haemorrhage (SAH). This is difficult, particularly in the geriatric population ≥ 75 years. The study by Nieuwkamp *et al* (see p 933)¹ deals with this important issue in a cohort of 170 patients from two different institutions, who were studied retrospectively. Overall favourable outcome was seen in 15% of patients in the age group. Predictors of unfavourable outcome were poor clinical

condition on admission, with recurrent haemorrhage and subdural extension of the haematoma.

In the past, it has been hypothesised that SAH should not be treated after the age of 60 years.² Although later studies have shown that patients may benefit from being treated in the seventh and eighth decades of life,³ it has remained controversial at what age treatment cannot improve the outcome anymore. The role of concomitant medical disease may also be important, but it is yet to be discussed in the literature adequately. In addition, predictors of favourable outcome have not been defined prospectively. Most neurosurgeons are hesitant to treat patients ≥ 75 years as intensely as

younger patients, because unfavourable outcomes are more likely. This may have produced a bias in the retrospective analysis and the results may reflect what has been expected from the beginning. For future investigations, some of the following considerations may be helpful.

The geriatric population is different from the younger adult population. As shown by other investigators, the rupture rate of aneurysms is higher and the outcome is more likely to be unfavourable.^{3,4} Important studies like the International Study of Unruptured Intracranial Aneurysms that investigated the natural history of unruptured aneurysms, however, did not stratify their analysis into different age groups.⁵

No prospective randomised controlled trials (RCTs) have looked into the subset of the geriatric population. In general, elderly patients have been treated in the same manner as other adults. Early treatment of aneurysms has been shown to be beneficial for adult patients after SAH. So long as geriatric patients are not accepted as representing a special subset similar to paediatric patients, there probably never will be an RCT. At this point, it is hard to justify that elderly patients should be randomised in trials stratified into treating aneurysms either by clipping or coiling, or by non-interventional or non-operative conservative treatment. In

the absence of RCTs, a case-control study design may help to approximate the issue.

In summary, because most of the healthcare insurance money is spent during the last weeks of a patient's life, prognostic data as provided by Nieuwkamp *et al*¹ are critical. On the basis of their results, investigators can only be inspired to set up an RCT or a case-control trial to further clarify this important question.

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Hidden encephalitis

Lock and key approach to “hidden” encephalitis

E J Thompson

Further keys to unlock diagnosis and treatment to “hidden” encephalitis can be obtained by access to PCR and IgG immunoblotting

Although varicella zoster virus is notorious for masquerading in various clinical presentations (eg, Guillain-Barré syndrome, Bell's palsy or even without the shingles rash), it nevertheless remains a completely curable disease, provided the suspicion of the neurologist is raised.¹ To clinch the diagnosis requires access to possibly two laboratories, thereby adopting a dual approach to both antibody and antigen (lock and key)—namely, viral immunoglobulin G (IgG) and polymerase chain reaction (PCR). The recent report by Sindic *et al*² (see p 938) admirably shows such an approach. They have confirmed the principle that early in the disease (first week) the virus predominates, but then antibody synthesis begins. Thus, the PCR test for antigen is positive in 62% (8/13) of cases during the first 7 days, but the viral-specific IgG thereafter becomes 83% (10/12) positive.

Continuing research into the technology of PCR has yielded further improvements, and in parallel there have also been important steps forward

in defining the specificity of the IgG response to viral and other infections. By using more refined examination of the qualitative immune response—for example, oligoclonal bands—it has also been possible to greatly improve the sensitivity of IgG assays and also the signal-to-noise ratio using better isoelectric focusing technology. This has allowed us to extend our examination of the total IgG population and then to just focus specifically on individual viral or other antigens and their corresponding patterns in the parallel cerebrospinal fluid and serum samples. This side-by-side comparison has been the bedrock to define local synthesis of IgG in the central nervous system, and thus it has also been a major step beyond the simple quantitative determination of IgG levels in cerebrospinal fluid and serum, as these do not distinguish any important clonal characteristics of the antibodies.

The same general notion of comparing PCR and IgG has also been found for other viruses, as shown in a large

national study of encephalitis in Finland.³ The authors showed 5.1% (133/2590) positive cases using PCR; however, using IgG assaying 7.7% (245–3173) positive cases were identified. A more recent case review of a much smaller number of patients with herpes simplex virus encephalitis emphasised the importance of viral IgG (4/4 positive) assaying to complement PCR (5/6 positive).⁴

For best practice, it is hoped that adequate paraclinical support will be available to neurologists, which gives them access to the laboratories (for both PCR and viral IgG immunoblotting), thus producing further keys to unlock considerably more diagnosis and treatment of “hidden” encephalitis.

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