MATTERS ARISING

Predicting the outcome of acute stroke

The multivariate models examined by Gladman, Harwood and Barer predicted death within three months of a stroke with an accuracy of only 50–75%. It should be emphasised, however, that these models were not designed to predict mortality at three months, and the Bayes models were designed to predict mortality at one and six months respectively, and the Guy's Hospital Prognostic Score was designed to predict death or functional dependence at two months. We have used data from an unselected cohort of patients registered with the Oxfordshire Community Stroke Project (OCS) to examine the utility of the Guy's score in predicting severe functional dependence or death at one and six months after first stroke. For this analysis a modified Rankin grade of 4 or 5 was taken to indicate severe functional dependence.

When applied to the 165 patients registered in the final year of the OCS, when the relevant data items were collected, the Guy's score predicted severe functional dependence or death one month after the stroke with a specificity of 99% and a sensitivity of 34% (predictive accuracy 77%).

A modified version of the score which omitted one clinical feature, loss of consciousness at onset, but could be tested on the Uppsala and Belfast cohort of 675 patients, performed with a similar accuracy (table 1). With the sensitivity of the modified score equal to that of impaired conscious level (unconscious or drowsy at 24 hr), the likelihood ratio of the modified score (8:0) exceeded that of impaired conscious level (5:5), suggesting that when used to predict both functional dependence and death, the Guy's score did provide additional prognostic information.

The clinical usefulness of the Guy's score may, however, be limited. The calculation was laborious and the score required the identification of higher cerebral dysfunction which was difficult in acute stroke patients. A single clinical feature, such as, impaired conscious level might therefore be preferred. In this analysis urinary incontinence (or the use of a urinary catheter), occurring between the time of the stroke and the examination by the study neurologist (median 4 days), was the most accurate predictor of a poor outcome (table 1).

JOHN BURN
Department of Rehabilitation Medicine, Southampton General Hospital, S09 4XY, UK
PETER SANDERCOK
Department of Clinical Neurosciences, Western General Hospital, Edinburgh EH4 2XU, UK

Gladman et al reply:

We agree with the comments of DrsBurn and Sandercok on our paper. The diversity of clinical measures required by the models we examined forced us to modify the predicted outcomes in some cases, to make comparisons. This did not significantly affect our overall conclusions and the Oxfordshire Community Stroke Project (OCS) results appear to confirm this. It is not surprising that the Guy's score was slightly better at predicting bad outcome (death or dependency) than conscious level alone as the latter variable forms part of the Guy's model. As Burn and Sandercok point out, the extra effort in collecting the other data needed for the model and calculating the score is probably not justified by the practical gains.

The OCS data also confirm, once again, the pre-eminence of consciousness as a predictor of functional outcome. If any additional information is required to modify the over-pessimistic forecasts of impaired conscious level alone, consciousness is the obvious choice. In our study we did not routinely collect information on consciousness on day 1 but we are able to test our proposal on an independent set of nearly 400 hospitalised patients in whom this information was available.

Table 2 shows the accuracy of various predictors of death or dependency at six months (54% of the whole patient group). Thirteen per cent of d rowsy patients were on day 1 and these were subtracted from the "bad prognosis" group to form a combined predictor (impaired conscious level and incontinence) with a likelihood ratio of 3:7 compared with 2:9 for impaired conscious level alone, and 2:4 for incontinence alone. A more elaborate combined scale involving different degrees of impaired consciousness and incontinence could also be constructed and might further improve predictive accuracy.

The practical value of all these predictive models and variables depends on the situation. Prognostic stratification is certainly important for clinical trials (and it may be impractical to use consciousness as a guide when very early medical intervention is required) and a simple system of "triage" may help in the efficient organisation of stroke services. We still maintain, however, that the modest gains in predictive accuracy provided by multivariate models are of negligible value in guiding the management of individual patients.

JOHN GLADMAN
DAVID BARR
University Department of Geriatric Medicine, Royal Liverpool University Hospital, Liverpool L69 3BX, UK

Hypergraphia and brain damage

We wish to comment on the paper by Iamamura et al on hypergraphia and brain damage, to show that hypergraphia can also be an uncommon symptom of a dementia of frontal type.

A 70 year old policeman with a positive family history for dementia came to our attention in 1991 with a severe cognitive impairment. He first had difficulty in drawing schemes of car accidents nine years previously, and this was soon followed by personality and behaviour disturbances such as disinhibition, aggressive behaviour, impulsivity, emotional lability. The following few years he developed word finding problems, gluttony, ritualistic behaviour, hoarding of objects, decreased speech output, verbal stereotypes, paraphasias and mild memory loss. In 1987 the patient became incontinent and suggested that he had lost his native tongue and was told that his speech was "broken". In 1989 he started compulsively writing his own signature filling some 1500 sheets