PostScript

CORRESPONDENCE

Subthalamic deep brain stimulation for advanced Parkinson's disease: all that glitters is not gold

I read with interest the article "Behavioural disorders, Parkinson's disease and subthalamic stimulation" by Houeto *et al* and the accompanying editorial published last year in your journal.[1 2] One of the main conclusions of that study was that sometimes the reality cannot be completely reflected in a paper because many studies conducted to assess the efficacy of therapeutic interventions in Parkinson's disease focus on the motor aspects of the disease, while other aspects—cognitive or emotional, for example—are forgotten or insufficiently assessed by current rating scales such as the UPDRS. This is the case with most of the published studies related to deep brain stimulation (DBS). For this reason, I would like to add our experience with 18 patients operated on in our centre and included in the largest multicentre study conducted up to now.[3] In this study neither cognitive functioning nor quality of life were properly evaluated. Four of the 18 patients were prematurely withdrawn because of the occurrence of severe adverse events (two intracranial haemorrhages, one possible cortical venous thrombosis resulting in infarction, and one severe infection necessitating the removal of both DBS systems). In another patient with an impressive clinical result, one electrode was removed because of an infection, leading to a loss of efficacy in the contralateral hemibody. Three patients showed an improvement in motor function but also cognitive deterioration which was clinically relevant in one of them. Motor symptoms were significantly ameliorated in another patient; however, he developed postural instability with falls and mild cognitive deterioration with confusional episodes requiring institutionalisation. Another patient with Parkinson's disease and an associated gait disorder poorly responsive to levodopa, and with multiple lacunae on MRI, experienced a mixed result: whereas rest tremor and rigidity were markedly improved, the gait remained unchanged. Moreover, she started to have urinary incontinence and remained in a wheelchair. In two further patients, though DBS markedly improved all the cardinal symptoms of Parkinson's disease and levodopa induced dyskinesias, they both developed profound depression with apathy and social isolation.

In summary, with respect to the global clinical impression and quality of life, we can conclude that six months after the intervention DBS was highly beneficial in six patients. However, the remaining 12 patients suffered from a series of adverse effects that precluded a good clinical outcome, although an improvement in motor function was observed in many of them. Thus one can obtain an unrealistic impression of the impact of DBS in real life in this particular group of patients if only the motor aspects of the disease are analysed and summarised in a table.

Furthermore, as has been repeatedly noted in several congresses, around 25–30% of patients included in the multicentre study improved by less than 25% in the motor subscale of the UPDRS in double blind assessment, a result that can be considered unsatisfactory. For this reason, in this and other studies it would be important to indicate the percentage of patients improving more or less than a given level (for example, 25% in UPDRS III).

It should be emphasised that this was our initial experience and, in fact, it is quite similar to the one reported by Kumar *et al* with their initial nine patients.[4] Seven of them completed evaluations and four of them (elderly patients with advanced disease) developed operative complications. In spite of this, the reduction in off-period parkinsonism and the increase in daily "on" time were impressive. These investigators concluded that the motor benefits outweighed the adverse effects. This was also the case in some (but not in all) of our patients.

Finally, a recently published retrospective study of 211 patients conducted by Spanish teams showed that 19% of the operated patients failed to obtain the expected result.[5] Analysis of the possible reasons for these unsatisfactory results showed that the correct selection of surgical candidates (72% were elderly patients or had mild cognitive deficits, lacunae on MRI, or levodopa resistant symptoms) and definition of the target, along with surgical experience, were of crucial importance in obtaining the best results. The use of stricter selection criteria (a careful preoperative evaluation of psychiatric and cognitive function seems to be mandatory after the report by Houeto *et al*), and a larger surgical experience might improve these results. Therefore, I am convinced that at present the results are improving and will be even better in the future. I hope that the experiences of Houeto *et al*, along with those reported in this letter, will be useful for teams who are ready to start DBS procedures.

G Linazasoro
Centro de Neurología y Neurocirugía funcional, Clinica Quirón, Parque Alcolea s/n, 20012 San Sebastian, Spain; glinazasoro@terra.es

References

1 **Houeto JL**, Mesnage V, Mallet L, *et al*. Behavioural disorders, Parkinson's disease and subthalamic stimulation. *J Neurol Neurosurg Psychiatry* 2002;**72**:701–7.
2 **Brown RG**. Behavioural disorders, Parkinson's disease and subthalamic stimulation. *J Neurol Neurosurg Psychiatry* 2002;**72**:689.
3 **Study Group**. The deep-brain stimulation for Parkinson's disease study group. Deep-brain stimulation of the subthalamic nucleus or the pars interna of the globus pallidus in Parkinson's disease. *N Engl J Med* 2001;**345**:956–63.
4 **Kumar R**, Lozano AM, Kim YJ, *et al*. Double-blind evaluation of subthalamic deep brain stimulation in advanced Parkinson's disease. *Neurology* 1998;**51**:850–5.
5 **Study Group**. Grupo de estudio de estimulación cerebral profunda en la enfermedad de Parkinson. Estimulación palidal y subtalámica en la enfermedad de Parkinson: enseñanzas de los malos resultados. *Neurología (Barcelona)* 2001;**16**:298–302.

Authors' reply

We thank Dr Linazasoro for his comments following the publication of our article.[1] The marked differences between our results and those of Dr Linazasoro are not related to the behavioural disorders we observed in some parkinsonian patients following bilateral subthalamic nucleus (STN) stimulation. Indeed, no reference is specifically made to psychiatric disorders.[1] As stated by Dr Linazasoro, the disappointing results obtained after neurosurgery in his experience are related to "the particular group of patients" included: the patients were old; the response of parkinsonian motor disability to levodopa treatment was poor; and there were axial motor signs poorly responsive to levodopa (gait disorder, postural instability, falls), cognitive impairment, and abnormal MRI (lacunae). It is therefore not surprising that the postoperative clinical outcome was poor, including severe adverse events. We agree with Dr Linazasoro that strict criteria need to be used to select appropriate candidates for neurosurgery. In our own experience, excellent results can be obtained provided that strict inclusion criteria are fully respected: the response of the patients to levodopa treatment must be excellent, which means that axial motor symptoms (that is, freezing, postural instability, hypophonia), known to poorly respond to levodopa, must be absent or moderate; cognitive and psychic impairment must also be absent, and the MRI normal.[2] Needless to say, the effect of the neurosurgery also depends upon the optimal placement of the electrodes within the STN, together with careful postoperative fine tuning of the electrical parameters.

In brief, the success of this neurosurgical approach to levodopa responsive forms of Parkinson's disease requires the expertise of a multidisciplinary team including neurosurgeons, neuroradiologists, neurophysiologists, and neurologists.

J L Houeto, V Mesnage, L Mallet, M L Welter, D Dormont, B Pidoux, P Cornu, Y Agid
Centre d'Investigation Clinique and IFR 70 Neurosciences, Hôpital de la Salpetriere, 47 bvd de l'Hôpita175013, Paris, France; agid@ccr.jussieu.fr

References

1 **JL Houeto**, V Mesnage, L Mallet, *et al*. Behavioural disorders, Parkinson' s disease and subthalamic stimulation. *J Neurol Neurosurg Psychiatry* 2002;**72**:701–7.
2 **Welter ML**, Houeto JL, Teznas du Montcel S, *et al*. Clinical predictive factors of subthalamic stimulation in Parkinson's disease. *Brain* 2002;**125**:575–83.

Head injury outcome prediction in the emergency department: a role for protein S-100B?

I read with great interest the recent article by Townend *et al*[1] in which the authors studied the predictive value of protein S-100B in patients with head injury upon performance in the extended Glasgow outcome scale (GOSE). One important criticism is that the study was performed in patients with head injury defined as "any blow to the head causing a clinical diagnosis of head injury to be made, even if insufficient to cause definite loss of consciousness" and not only in patients with traumatic brain injury, which is defined