Relation between depression after stroke, antidepressant therapy, and functional recovery

G Gainotti, G Antonucci, C Marra, S Paolucci

Abstract
The aim was to evaluate the effects of post-stroke depression and antidepressant therapy on the improvement of motor scores and disability, to verify if the negative effects of poststroke depression on functional recovery could be counterbalanced by taking antidepressant drugs. Results obtained before, during, and after rehabilitation—on the Barthel index, Canadian neurological scale, and Rivermead mobility index—by 49 depressed patients with stroke, who had been treated (n=25) or not treated (n=24) according to the different therapeutic approaches of their physicians, were compared with results similarly obtained by 15 non-depressed patients with stroke. Analysis was by multivariate analysis of variance for repeated measures.

There was a non-significant difference between the groups in their motor and functional scores, and a significant improvement on time. A significant interaction between group and time was seen. This interaction was particularly significant on the Rivermead mobility index, and was due to the fact that the recovery of non-treated depressed patients with stroke was less than the non-depressed and the depressed but treated patients with stroke. Furthermore, recovery from depression was significantly greater in treated than in non-treated depressed patients with stroke.

In conclusion, poststroke depression has negative effects on functional recovery, and a pharmacological treatment of depression can counterbalance this effect.

Keywords: poststroke depression; antidepressant drugs; functional recovery

Neuropsychological Unit, Institute of Neurology, UCSC, L go A Gemelli 8, Rome I-00168, Italy
G Gainotti
C Marra

Department of Psychology, University La Sapienza, Rome, Italy
G Antonucci

IRCCS Santa Lucia. Rome, Italy
S Paolucci

Correspondence to:
Dr G Gainotti
iclnp@rm.unicatt.it Received 27 April 2000 and in revised form 13 February 2001. Accepted 12 March 2001

Relation between depression after stroke, antidepressant therapy, and functional recovery but its effects on the outcome of rehabilitation remain controversial. Some authors have found that poststroke depression has a negative effect on recovery of functions of daily life activities, but other authors have not.

The reason for this controversy could be the confusing effect of antidepressant drugs, as some physicians tend to use these drugs in patients with poststroke depression, whereas others are reluctant to do so. Because some authors have reported a positive effect of some antidepressant drugs on the functional recovery of patients with stroke, it is possible that in treated patients the positive effect of these drugs may have counterbalanced the deleterious influence of the depression.

We think that a randomised study comparing treated and untreated patients with poststroke depression is unethical. However, we have data from a cohort of patients with stroke who were followed up for other research purposes between June 1994 and July 1997. These patients were under the care of physicians, some of whom were inclined to treat poststroke depression and some of whom were not. We decided retrospectively to examine this data set. Our working hypothesis was the following: if poststroke depression has a deleterious influence on rehabilitation, but this effect is counterbalanced by the administration of antidepressant drugs, then an interaction should be found between the results of the rehabilitation process and the presence of a (treated or untreated) poststroke depression. The worst results should be obtained by untreated depressed patients.

Subjects and methods
Subjects were selected from among inpatients consecutively admitted from June 1994 to June 1997 to the Rehabilitation Center Clinica Santa Lucia after a recent stroke. During those years, both the clinical aspects of poststroke depression and the rehabilitation process had been assessed with valid and reliable measures during research programs aiming to investigate: (a) the phenomenological aspects and the anatomical correlates of poststroke depression, and (b) the variables associated with a positive outcome of rehabilitation.

Furthermore, some patients had been treated and others had not (after the initial assessment of the variables under study)
Relation between depression after stroke, therapy, and functional recovery

259

Values in parentheses are SD.

<table>
<thead>
<tr>
<th></th>
<th>Non-depressed (n=15)</th>
<th>Depressed but treated (n=24)</th>
<th>Depressed and non-treated (n=25)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (y)</td>
<td>63.6 (12.1)</td>
<td>60.5 (8.9)</td>
<td>62.1 (14.7)</td>
</tr>
<tr>
<td>Sex (M/F)</td>
<td>9/6</td>
<td>14/10</td>
<td>13/12</td>
</tr>
<tr>
<td>Interval from stroke (months)</td>
<td>3.1 (1.2)</td>
<td>2.9 (1.3)</td>
<td>3.2 (1.3)</td>
</tr>
<tr>
<td>Years of schooling</td>
<td>10.1 (6.8)</td>
<td>7.5 (5.04)</td>
<td>10.2 (5.57)</td>
</tr>
<tr>
<td>Side of stroke (left/right)</td>
<td>8/7</td>
<td>10/14</td>
<td>9/16</td>
</tr>
<tr>
<td>HDRS Scores (entry/end)</td>
<td>6.7 (4.7)/5.06 (3.2)</td>
<td>16.0 (6.4)/6.51 (7.9)</td>
<td>18.6 (7.7)/13.2 (6.3)</td>
</tr>
<tr>
<td>Canadian NS scores (entry/end)</td>
<td>7.2 (2.3)/10.4 (1.3)</td>
<td>5.7 (1.7)/7.9 (2.1)</td>
<td>5.9 (2.4)/7.5 (2.8)</td>
</tr>
<tr>
<td>Barthel I scores (entry/end)</td>
<td>51.3 (25.2)/90.7 (14.5)</td>
<td>35.0 (18.2)/74.4 (21.5)</td>
<td>38.4 (31.3)/63.2 (29.4)</td>
</tr>
<tr>
<td>Rivermead MI scores (entry/end)</td>
<td>5.4 (4.4)/11.6 (3.8)</td>
<td>2.4 (2.1)/8.9 (3.6)</td>
<td>3.9 (5.0)/8.8 (4.6)</td>
</tr>
</tbody>
</table>

The Barthel index, the scores of which range between 0 and 100—the top scores implying complete functional independence in daily life activities; (2) the revised and validated version of the Canadian neurological scale, which assesses the patient’s ability in 15 common daily movements with the highest score corresponding to complete motor ability.

The baseline assessment made at the entry into the clinic, the intermediate assessment made after 1 month of rehabilitation, and the final assessment made at the end of the rehabilitation programme were used to evaluate the effect of the main variables (groups and repeated measures) and their interaction with the results obtained with the impairment and disability scales (Canadian neurological scale, Barthel index, and Rivermead motility index). Data were subjected to a two way multivariate analysis of variance (MANOVA) repeated measures analysis. Post hoc comparisons were by Tukey test for unequal sample size when the effect of the main factors or the interaction reached significance.

Results

The characteristics of the 49 depressed (24 treated and 25 non-treated) and the 15 non-depressed patients with stroke who entered the study are reported in table 1.

Age, sex, education level, hemispheric side of lesion, and interval between the onset of stroke and the beginning of the rehabilitation programme were similar among groups. On the contrary, severity of depression and scores obtained at the entry of the study with the Canadian neurological scale, Barthel index, and Rivermead mobility index were worse in depressed than in non-depressed patients with stroke. On the other hand, neither the severity of baseline depression nor baseline scores obtained with impairment and disability scales were different in treated and untreated depressed patients. The fact that scores obtained on the HDRS were similar in treated and untreated depressed patients with stroke, supports our assumptions that the decision to treat or not was based on the a priori opinion of their physicians and not on the severity of depression.

A one way ANOVA repeated measures comparing the HDRS for the treated and non-treated depressed patients with stroke, showed a better recovery from depression in the treated than in the untreated group (p<0.01)
ANTIDEPRESSANT DRUGS, AND OUTCOME OF THE REHABILITATION

The aim was to evaluate the influence of post-stroke depression and antidepressant treatment on functional recovery in patients with stroke undergoing rehabilitation therapy. In particular, we intended to see if the negative effect of poststroke depression on functional recovery could be counterbalanced by the administration of antidepressant drugs. The results, showing that non-treated depressed patients present the lowest rate of functional recovery, whereas depressed but treated patients with stroke have a recovery rate similar to the non-depressed ones, clearly support this hypothesis. This claim is strengthened by two aspects of our study which suggest that the particularly modest results obtained by the untreated depressed patients were due to the harmful influence of psychological factors, and not to uncontrolled sampling bias between treated and non-treated patients. The first refers to the fact that at the beginning of the study, the two groups of depressed patients were indistinguishable in severity of depression and measure of impairment. The second refers to the fact that a different level of interaction between groups and treatment was found on the different outcome measures considered. This interaction was significant on the Rivermead mobility index and on the Barthel index (which are disability scales that examine behavioural aspects and are, therefore, more sensitive to the influence of psychological factors) and non-significant on the Canadian neurological scale (which examines more basic neurological impairment and is, therefore, less sensitive to the effect of these factors). The effects of antidepressant drugs on mood and functional recovery could be, at least partly, independent. Dam et al. have shown that the noradrenaline (norepinephrine) reuptake blocker maprotiline and the serotonine reuptake inhibitor fluoxetine have a similar effect on mood, but a different one on functional recovery; both improve the HDRS scores, but only fluoxetine actually improves functional recovery, whereas maprotiline hinders it. Future investigation is needed to clarify if the association between functional improvement and reduction of the depressive symptomatology found in our study with fluoxetine is seen with other antidepressant drugs. Clarification of this issue could help establish the most favourable drug for the treatment of poststroke depression.

3 Andersen G, Vestergaard k, Rui JO, et al. Incidence of poststroke depression during the first year in a large unselected

Figure 1  Mean scores on the Barthel index, Canadian neurological scale, and Rivermead mobility index obtained by the three groups of patients at the times studied.


Relation between depression after stroke, antidepressant therapy, and functional recovery

G Gainotti, G Antonucci, C Marra and S Paolucci

J Neurol Neurosurg Psychiatry 2001 71: 258-261
doi: 10.1136/jnnp.71.2.258

Updated information and services can be found at:
http://jnnp.bmj.com/content/71/2/258

These include:

References
This article cites 15 articles, 6 of which you can access for free at:
http://jnnp.bmj.com/content/71/2/258#BIBL

Email alerting service
Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

Topic Collections
Articles on similar topics can be found in the following collections
- Mood disorders (including depression) (221)
- Long term care (76)
- Stroke (1449)
- Drugs: musculoskeletal and joint diseases (259)

Notes

To request permissions go to:
http://group.bmj.com/group/rights-licensing/permissions

To order reprints go to:
http://journals.bmj.com/cgi/reprintform

To subscribe to BMJ go to:
http://group.bmj.com/subscribe/