The measurement of emotional reaction and depression in a South African stroke population

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Summary

The study evaluated the sensitivity of a newly devised scale for measurement of emotional reactions and depression, on a group of 25 stroke patients, with right or left hemisphere damage, and 15 age-matched controls. Four clusters were examined: communication, expression of emotions, sense of self and physical or psychomotor problems. Case history factors such as time since onset, gender, anti-depressant medication and severity of aphasia were related to performance on the scale. Results indicated that the scale allowed for expression of emotion in all three groups tested and that speech and communication items significantly differentiated right and left hemisphere subjects. A strong correlation was found between spousal reports and self reports on selected items of the scale. Time since onset was found to be important in predicting level of depression. These findings have implications for assessment and management of stroke.

Introduction

The cluster of emotional reactions, which include depression, are a common sequel of stroke and are important factors in determining outcome and response to therapy. Nevertheless many problems still surround the classification and identification of such reactions, and as Sarno suggests, the literature tends to reflect little research and sporadic, generally unsustained interest in the psychosocial sequelae of stroke.

This paper reports on a preliminary study designed to establish the nature of emotional responses in a South African stroke population.

Some unresolved and important issues include the actual mechanism of the depression and the extent to which lesion-dependent factors relate to emotional reactions in stroke as well as the evolution of depression in the recovery course (see Gainotti for an excellent review of these issues).

With regard to left hemisphere damage for example, some authors (e.g. Robinson and Benson) have suggested that the development of depression in stroke patients may be affected by the location of the lesion and is found more often in anterior aphasias and those lesions close to the frontal lobe. Patients with non-fluent aphasias are hypothesized to show greater awareness of their problems and therefore greater severity of depression than patients with either fluent or global aphasias. Others (e.g. Starkstein and Robinson) suggest that presence and type of aphasia do not appear to be critical variables for predicting the presence or severity of depression, although depression and especially Broca's aphasia frequently co-exist and may be considered to be two independent outcomes of stroke that are dependent on the location of the lesion.

The cluster of symptoms associated with lesions to the right hemisphere also poses a methodological problem: typically such patients manifest what has been described as 'indifference reactions' which often appear to accompany neglect of the contralateral half of the body and space. The indifference reaction is characterized by an indifference to or minimization of symptoms, euphoria and emotional placidity and apraxic speech patterns. The clinician is unable to use affective behaviours as clues by which to infer the patient's internal mood state because these patients present with flattened affect. Similarly, on open-ended questions about emotional aspects, these patients typically manifest a verbose, digressive and tangential style of communication. Such reactions appear to have been interpreted to mean that such patients (in contrast to those with left hemisphere lesions) are relatively free of depression.

Another issue which poses problems is the recognition and measurement of emotional factors in stroke patients. The standard diagnostic criteria for depression for example are often not applicable, since the neurological lesion may distort characteristic clinical features of depression. Typically the scales used have been normed on populations who are younger and who are not neurologically implicated. Further, many of the Depression scales such as the Zung Self Rating Depression Scale, the Beck Depression Inventory, the Hamilton...
stroke. Four items specifically related to stroke were omitted from the SAD scale for the normal subjects.

An example of scale items from each of these clusters is presented in the Appendix.

The SAD scale was constructed with opposite statements and an accompanying visual drawing or symbol (drawn from a software programme) on either side of a 7 cm line. Subjects were required to mark on the scale the point where the patient felt his or her feelings were best reflected, in relation to the two opposite statements on either side of the scale. If hemiplegia or aphasia prevented the individual from using a pen or pencil, the subject was asked to point to the mark on the scale. Each subject was tested individually and the statements were relayed to the subjects in three ways (using visual symbols, auditory input and written information), according to the particular perceptual and linguistic abilities of each subject. Where necessary, items were repeated to ensure comprehension.

In addition, the spouses of all subjects were interviewed by means of a schedule which incorporated questions about a number of areas tapped by the SAD as well as about the subjects' premorbid abilities and personality. For validation purposes, questions for five specific SAD items were correlated with the subjects' responses (one from each cluster). An interview guideline was used, with appropriate modifications used for the spouses of normal subjects.

The Visual Analogue Scale was scored by measuring the distance (mm) from the patient's mark from the right to the left end, where the left end represented the patient's worst mood and the right end represented the patient's best mood. Responses were therefore scored from 0 to 7 cm, rounded to the nearest centimetre. A mean score of 0–3 reflected less depression while a mean score of more than three reflected more severe depression.

A separate analysis was performed for the four separate constructs.

The results were statistically analysed using the SAS PROC GLM statistical computer package. ANOVAs were used to analyse the difference between groups in terms of overall score as well as clusters on the questionnaire, as well as case history factors analysis with medication, gender and severity (as measured on the BDAE severity rating scale) and time since onset.

Results and discussion

OVERALL SCORES AND SENSITIVITY OF THE TOOL

The first finding is that the scale and its construction appeared to allow for expression of emotion in all three groups studied. The aphasic, right hemisphere and normal subjects all presented with scores depicting the presence of depression on this scale. This is evident from depression scores reflected in Figure 1.

The results showed further that there appeared to be no statistically significant difference in depression scores between the aphasic patients (left hemisphere lesions), stroke patients without aphasia (right hemisphere lesions) and normal age matched subjects. According to the analysis of variance, no group was significantly more depressed than the other groups ($p \geq 0.77$).

However, as reflected visually, a tendency towards higher depression scores appeared in the two stroke groups investigated in comparison to the normal group. Further, on the relevant items which tested this (Questions 1 and 2) the stroke subjects indicated a marked difference in their depression levels before and after the stroke. This is reflected in Figure 2.

These results suggest that in the stroke subjects when the linguistic difficulty is bypassed and the response is a focused and non verbal one, the difference between right and left hemisphere groups (highlighted in some previous research) is not apparent. Standard measures of depression as discussed tends to be linguistically complex not only for the patient with aphasia (left hemisphere lesion) but also for the subtle communication problems of a right hemisphere patient.

Thus, the results of this study confirm Ross and Rush who stated that depression is described as 'neither a right nor left hemisphere syndrome, both hemispheres participate in the depressive syndrome, each modulating certain signs and symptoms' (p. 1353).

The finding with regard to the presence of depression in the normal control group was not unexpected. This group was matched for age to the stroke patients and the high prevalence of depression in the elderly is a common

![Groups](image)

**Figure 1** Mean depression scores for the three groups
Rating Scale\textsuperscript{14} referred to in the literature that have been used to assess depression in stroke patients, are dependent on a high level of linguistic (e.g. verbal and written response), visual, concentration, perceptual and memory skills for completion, many of which are compromised in both right and left hemisphere stroke.\textsuperscript{15} For these reasons, subjects are often excluded from study using such tools.

The present study was designed to bypass some of these difficulties and to explore further the relationship between the presence and absence of aphasia and site of lesion and the emotional responses of a South African stroke population.

Aims

The primary aim of this study was to evaluate the sensitivity of a newly devised tool, the Stroke and Aphasia Depression (SAD) Scale on stroke patients. The tool was constructed in order to assess the presence of depression and the subjects' perceptions of their own emotional state.

The second aim was to assess if there is a difference in the perception, expression and type of emotional state between the stroke patients without aphasia (right hemisphere lesion), the stroke patients with aphasia (left hemisphere lesion), and age-matched normal subjects. Specifically, it aimed to explore the differences between the groups regarding their emotional reactions and their perceptions regarding the stroke, their perception of their ability to communicate, their expression of emotions, their sense of self, and their physical status.

The third aim was to relate the nature of the subjects' emotional reactions as reported by their spouses or significant others with those of aphasic patients, stroke patients without aphasia and normal subjects' responses on the SAD scale.

Lastly, the study aimed to determine if there is a relationship between case history factors such as time since onset, gender, anti-depressant medication and severity of the aphasia (as measured on the Boston Diagnostic Aphasia Examination severity rating scale) and the emotional responses of the aphasic and stroke patients on the SAD scale.

Subjects

Twenty-five stroke patients and 15 age-matched controls participated in the study. The stroke patients were further divided into those with right (RH) and left hemisphere (LH) lesions.

Subjects were required to be neurologically stable and to have sufficient comprehension in order to complete the scale. Type and severity of aphasia were not strictly specified, but criteria for inclusion were that:

- subjects had to be first language English speakers.
- subjects with a history of bipolar or major depressive incidents prior to the stroke or who had received anti-depressive medication prior to the stroke were excluded.
- subjects were required to have a spouse or significant other, in order to control as far as possible for the well documented effects of environment on depression as well as to ensure opportunity for validation of the scale by means of spouse reports.

Measurement tool

The tool devised for this study was the SAD scale drawn up to incorporate the content of various tests of depression, namely the Zung Self Rating Depression Scale,\textsuperscript{20} the Beck Depression Inventory,\textsuperscript{18} the Hamilton Rating Scale\textsuperscript{14} in combination with information and results of studies on post-stroke emotional reactions and depression.\textsuperscript{16,17}

The main format was the Visual Analogue Scale which has been used previously with success with stroke population, as it bypasses difficulties with reading and writing and is simple to explain and use, requiring a focused non-verbal response.\textsuperscript{8,18-20}

The task included the presentation of visual drawings and symbols in combination with auditory and written stimuli in the form of simple linguistic information to supplement the symbols. This multimodal presentation was designed to bypass some of the difficulties experienced by stroke patients and to provide a visual picture for those with impaired comprehension and alexia. The literature suggests several ways in which pictures might facilitate comprehension of sentences presented along with them: the presence of pictures has a positive effect on retention and memory, subjects carry out 'find and compare' strategies, and pictures provide a context into which sentences accompanying a picture might be integrated and they enhance sentence comprehension for an aphasic subject by heightening the visual imagery present in the task.\textsuperscript{21-23}

The SAD scale consisted of two trial items and 30 scaled closed-ended questions which centred around four clusters: namely speech or communication (through three items: 3, 4, 6), expression of emotions (through nine items: 5, 9, 10, 11, 12, 13, 24, 26, 27), sense of self (through eight items: 7, 8, 14, 15, 16, 17, 18, 28) and physical or psychomotor problems (through six items: 19, 20, 21, 22, 23, 25). The remaining items tapped attitudes to therapy and emotional state before the
specific communication difficulties, suggests the importance of the speech pathologist in diagnostic, as well as therapeutic roles.

References


Appendix

Examples of items from the SAD (from each of the four clusters).

1. COMMUNICATION

3. My communication difficulties make me sad.

My communication difficulties do not bother me.

![Sad Face](image1)

![Happy Face](image2)

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2. EXPRESSION OF EMOTION

11. I sometimes wish that I would rather not be alive  
   | I am glad that I am alive

3. SENSE OF SELF

17. I feel that I am not useful or needed.  
   | I feel that I am useful

4. PHYSICAL SYMPTOMS OF DEPRESSION

22. I have lost or put on weight recently  
   | My weight remained consistent