An Efficient Way to Detect Poststroke Depression by Subsequent Administration of a 9-Item and a 2-Item Patient Health Questionnaire

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Background and Purpose—The early detection of poststroke depression is essential for optimizing recovery after stroke. A prospective study was conducted to investigate the diagnostic value of the 9-item and the 2-item Patient Health Questionnaire (PHQ-9, PHQ-2).

Methods—One hundred seventy-one consecutive patients with stroke who could communicate adequately were included. In the 6th to 8th weeks after stroke, depression was measured using the PHQ-9 and PHQ-2 and diagnosed using the Composite International Diagnostic Interview.

Results—Of the participating patients, 20 (12.2%) were depressed. The PHQ-9 performed best at a score ≥10, a sensitivity of 0.80 (95% CI, 0.62–0.98), and a specificity of 0.78 (95% CI, 0.72–0.85) and the PHQ-2 at a score ≥2 with a sensitivity of 0.75 (95% CI, 0.56–0.94) and a specificity of 0.76 (95% CI, 0.69–0.83). Administering the PHQ-9 only to patients who scored ≥2 on the PHQ-2 improved the identification of depression (sensitivity, 0.87; 95% CI, 0.69–1.04).

Conclusions—The diagnostic value is acceptable to good for PHQ-9 scores ≥10 and PHQ-2 scores ≥2. Conducting a PHQ-9 only in patients with a PHQ-2 score ≥2 generates the best results. (Stroke. 2012;43:854-856.)

Key Words: depression ■ diagnostic value ■ stroke recovery ■ validity
Procedure
All patients with stroke admitted to the participating wards were registered. Before discharge ($T_1$), a research nurse checked whether the patient fitted the inclusion criteria. If that was the case, the nurse asked informed consent and collected the baseline data. After discharge, the research nurse and the researcher visited the patient at 6 to 8 weeks after stroke onset ($T_2$). The nurse administered the PHQ-9 followed by the researcher who administered the Composite International Diagnostic Interview. To be blinded to the PHQ-9 scores, the researcher left the room at the time the nurse completed the PHQ-9.

Analysis
Appropriate parameters based on a 2×2 table were calculated to determine the diagnostic accuracy of the PHQ for different cutoff values. As a summary measure of discriminatory power, independent of cutoff value, the area under the curve was determined.

Results
Of 164 patients, 20 (12.2%; 95% CI, 7.2–17.2) were diagnosed with depression (Table). The discriminatory power of the PHQ-9 and PHQ-2 for major depression was good with an area under the curve of 0.87 (95% CI, 0.80–0.93) and 0.82 (95% CI, 0.73–0.91), respectively (Figure 2). The accuracy of the PHQ-9 was best at a cutoff score of ≥10 with a sensitivity of 0.80 (95% CI, 0.62–0.98) and specificity of 0.75 (95% CI, 0.62–0.98) and specificity of 0.78 (95% CI, 0.72–0.85). The PHQ-2 showed the best accuracy at a cutoff score of ≥2 with a sensitivity of 0.75 (95% CI, 0.56–0.94) and specificity of 0.76 (95% CI, 0.69–0.83).

The administration of the PHQ-9 only in patients who scored ≥2 on the PHQ-2 improved the identification of depressed patients, as shown by the sensitivity (0.87; 95% CI, 0.69–1.04). The specificity was 0.20 (95% CI, 0.07–0.33). The other parameters at the different cutoff values are presented in Figure 1.

Table. Study Population

<table>
<thead>
<tr>
<th>Patients</th>
<th>n=164</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender, no. (%)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>97 (59.1)</td>
</tr>
<tr>
<td>Age, y</td>
<td>Mean (SD) (minimum–maximum)</td>
</tr>
<tr>
<td>Type of stroke, no. (%)</td>
<td></td>
</tr>
<tr>
<td>Intracerebral hemorrhage</td>
<td>22 (13.4)</td>
</tr>
<tr>
<td>Infarction</td>
<td>142 (86.6)</td>
</tr>
<tr>
<td>Localization, no. (%)</td>
<td></td>
</tr>
<tr>
<td>Left</td>
<td>69 (42.1)</td>
</tr>
<tr>
<td>Right</td>
<td>67 (40.9)</td>
</tr>
<tr>
<td>Others</td>
<td>28 (17.1)</td>
</tr>
<tr>
<td>Barthel Index</td>
<td></td>
</tr>
<tr>
<td>Mean (SD) (minimum–maximum)</td>
<td>13.04 (6.2) (0–20)</td>
</tr>
<tr>
<td>MMSE score ≥18, no. (%)</td>
<td>164 (100)</td>
</tr>
<tr>
<td>FAST score ≥15, 16, or 17, no. (%)*</td>
<td>162 (98.8)</td>
</tr>
<tr>
<td>Diagnosis of Depression (CDI), no. %</td>
<td>20 (12.2)</td>
</tr>
<tr>
<td>Time since stroke onset, wk</td>
<td></td>
</tr>
<tr>
<td>Mean (SD) (minimum–maximum)</td>
<td>6.7 (0.9) (5–9)</td>
</tr>
</tbody>
</table>

MMSE indicates Mini-Mental State Examination; FAST, Frenchay Aphasia Screening Test; CDI, Composite International Diagnostic Interview; SD, standard deviation.

* Cutoff value: age in y ≤60: ≥17, ≥61 and ≥70: ≥16, ≥71: ≥15.
Discussion

The findings of this study show that the diagnostic value for PHQ-9 scores ≥10 and for PHQ-2 scores ≥2 was acceptable to good. The highest sensitivity was found for the PHQ-9 in patients who had a PHQ-2 ≥2.

Only patients who were able to communicate adequately were selected because the assessment of depression using the PHQ-9 and the Composite International Diagnostic Interview highly depends on verbal and cognitive competence. This limits the generalizability of our results to this subpopulation.

The diagnostic performance of the PHQ-9 was slightly lower than the performance found by Williams and colleagues. In our study, however, patients were not selected on symptoms of depression, which is essential for assessing diagnostic accuracy of a test. Moreover, the diagnosis of depression was made blind to PHQ-2 scores assessment. Selected patients and unblinded diagnoses may have produced too optimistic results in the study of Williams and colleagues. Compared with the results of a diagnostic meta-analysis of the PHQ-9 within different patient groups, some differences were found in the specificity (0.79 versus 0.92 in the meta-analysis), but the sensitivity was comparable. The lowest specificities were found in cardiology, brain injury, and stroke populations. Interestingly, in those studies, it was unclear whether the diagnoses were performed blinded for PHQ-9, possibly leading to overly optimistic results.

Different instruments are available for the screening of depression in patients with stroke. Although their performance in the stroke population is adequate, the PHQ-9 and PHQ-2 are preferable over other instruments, because they are brief and easy to use and are acceptable to patients. To save time and limit the burden of patients, it is recommended to conduct the PHQ-2 screening in all patients and only the PHQ-9 in case of a positive outcome of the PHQ-2.

In summary, the results of this prospective study among unselected patients with stroke suggest that the PHQ-9 and PHQ-2 are preferable instruments for the early detection of poststroke depression in the daily care of patients with stroke.

Disclosures

None.

References

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