Cleveland Clinic Experience with Post Stroke Depression Screening

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Presenter Disclosure Information

• Nicole Smith, PA-C
• Cleveland Clinic Experience with Post Stroke Depression Screening

• FINANCIAL DISCLOSURE:
  • No relevant financial relationship exists
Objectives

• Discuss the importance of recognizing post stroke depression

• Review literature on common screening tools for post stroke depression

• Review the current guidelines on screening for post stroke depression

• Review the post depression screening algorithm at Cleveland Clinic

• Discuss the Cleveland Clinic Experience with Depression Screening

Why is it important to detect Post Stroke Depression (PSD)?:

Prevalence of any depression (major and/or minor depression) is 33% in people who have had a stroke

Untreated PSD:

• Impairs physical rehabilitation and recovery
• Causes greater impairment including greater reductions in activities of daily living
• Increased risk of subsequent stroke, other CVD, death
• Greater caregiver distress
• High risk of relapse of depression even after remission over a long period of time

Diagnosis of Post Stroke Depression

- Based on a Structured Clinical Interview for DSM Disorders (SCID) for DSM-IV TR for Major and/or Minor Depression

- Validated screening tools can be used prior to full clinical assessment

Beck Depression Inventory (BDI)
Hamilton Depression Rating Scale (HDRS)
Hospital Anxiety and Depression Scale (HADS)
Montgomery Asberg Depression Rating Scale (MADRS)
Geriatric Depression Scale (GDS)
The Center for Epidemiological Studies Depression Rating Scale Revised (CESD-R)
Patient Health Questionnaire (PHQ-9)
Visual Analog Scales – Distress Thermometer (DT)

Challenges in Screening for Post Stroke Depression

1. No screening tool specifically designed for PSD
   - Overlap of depression and stroke symptoms – fatigue, lack of motivation
   - Stroke deficits interfere with assessment – aphasia, cognitive deficits, neglect

   Stroke Aphasic Depression Questionnaire (SADQ)
   Aphasic Depression Rating Scale (ADRS)

2. Timing of PSD screening has not been established – acute/post acute/rehab phases
Review of Literature on PSD Screening

Screening Tools and Timing of Screening

**Williams LS et al Stroke 2005**
PHQ-9 score ≥10 had 91% sensitivity and 89% specificity for **major depression**, and 78% sensitivity and 96% specificity for **any depression diagnosis**.
PHQ-2 score 3 had a 83% sensitivity and 84% specificity for **major depression** and a 78% sensitivity and 95% specificity for **any depression diagnosis**.
Screened between 1-2 months post stroke

**Berg et al Stroke 2009**
BDI, HDRS, and Clinical Global Impression assessment by professionals
Screened at ≥2 weeks post stroke

**Turner et al Stroke 2012**
PHQ-2 and -9, HADS, BDI-II, DT, and Kessler-10. All scales except DT performed adequately with no significant difference.
Screened > 3 weeks post stroke

**de Man-van Ginkel Nursing Res 2012**
PHQ-2 and PHQ-9 shows good reliability, validity, and clinical utility when used in stroke patients who are able to communicate adequately
Excluded - death or discharge < 14 days

**Meader et al JNPP 2014**
Systematic review of 18 prospective studies using SCID as the reference-suggests the CES-D, HDRS or the PHQ-9 as the most promising options.
Screened in the acute (~ 2 weeks) and post acute phases
Review of Literature on PSD Screening

Feasibility and Diagnostic Accuracy of Early Mood Screening to Diagnose Persisting Clinical Depression/Anxiety Disorder after Stroke
Lees et al Cerebrovascular Diseases 2014

Inpatient Screening tools: Hospital Anxiety and Depression Scale (HADS) and Depression Intensity Scale Circles (DISCs) done 2 days after admission

Outpatient screening tool done at 1 month follow up appointment: Mini-International Neuropsychiatric Interview (MINI)

Prevalence of depression during inpatient admission was 13%

Prevalence of depression at 1 month follow up appointment 20%

Conclusion: Even amongst medically stable stroke patients, depression/anxiety screening at acute stage may not be feasible or accurate

PSD Screening Guidelines

AHA Management of Adult Stroke Rehabilitation Care: A Clinical Practice Guideline. Stroke 2005 - BDI, HDRS, GDS, CES-D suggested. No recommendation for use of any specific tool over the other

NINDS recommended measures for emotional and cognitive status – NINDS – Canadian Stroke Network vascular cognitive impairment harmonization standards. Stroke 2006 Center for Epidemiologic Studies – Depression Scale (CES-D) – has been previously validated in the NINDS Stroke Data Bank
PSD Screening Guidelines

Comprehensive Overview of Nursing and Interdisciplinary Rehabilitation Care of the Stroke Patient. A Scientific Statement From the American Heart Association *Stroke* 2010
Care management of PSD Williams LS *Stroke* 2007
PHQ-2 ≥ 3 followed by PHQ-9 based on Williams LS *Stroke* 2005

Joint Commission - Requirements Specific to Comprehensive Stroke Center Certification advises Depression screening prior to discharge. No specific tool suggested

PSD screening at Cleveland Clinic

**Inpatient screening using PHQ-4 during admission for acute stroke**

Implemented in late 2012 to meet Joint Commission requirement for Comprehensive Stroke Centers to screen for depression in stroke patients prior to discharge

**Outpatient screening using PHQ-9 at stroke follow up visit**

Done via the Knowledge Program where disease specific health measures are collected prior to or at the time of outpatient visit

PHQ-9 used for depression screening
**Patient Health Questionnaire (PHQ-4)**

Combines two validated two-item screeners – PHQ-2 for depression and GAD-2 for anxiety.

<table>
<thead>
<tr>
<th>Over the past 2 weeks have you been bothered by these problems?</th>
<th>Not at all</th>
<th>Several days</th>
<th>More days than not</th>
<th>Nearly every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeling nervous, anxious, or on edge</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Not being able to stop or control worrying</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Feeling down, depressed, or hopeless</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Little interest or pleasure in doing things</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Total score rated as normal (0-2), mild (3-5), moderate (6-8), and severe (9-12)

*Kroenke K, et al Psychosomatics 2009*

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**Patient Health Questionnaire (PHQ-4)**

PHQ-4 screen was selected in consultation with Psychiatry Department.

PHQ-2 ≥3 showed a sensitivity of 83% and specificity of 90% for major depression; GAD-2 > 3 showed a sensitivity of 88% and specificity of 82% for generalized anxiety.

In the stroke population PHQ-2 ≥ 3 had a 83% sensitivity and 84% specificity for major depression and a 78% sensitivity and 95% specificity for any depression diagnosis.

*Williams LS et al Stroke 2005*
Inpatient Screening Using PHQ-4

Patient population screened: All patients admitted to Primary Stroke service located in the regular nursing floor or step-down units (admitted to these locations or transferred from NeuroICU)

Screened by: Midlevel Providers – NPs, PAs

Timing of Screen: Closer to expected discharge date – day of discharge or 1-2 days prior

Screen administered to: Patients only and no proxy.

Patients Not Screened:
- Admission and discharge during the same weekend
- Stroke consults (other non-neurology), General Neurology, Neurosurgery or NeuroICU services
- Unable to participate - severe aphasia, drowsy

Inpatient Screening Algorithm

PHQ - 4 ≥3

NO

1. Social worker consulted to provide community resources

YES

2. Attending physician notified - antidepressant medication or inpatient psychiatry consult requirement determined on a case by case basis

No intervention
Outpatient Screening Using PHQ-9

- Patient-reported via electronic tablet PC, patient kiosk PC, or from the patient's home through MyChart.
- Patient can get the help from accompanying person to complete the questionnaire
- Patient saved data is available for review within EMR at the time of the Stroke follow up visit.

Patient Health Questionnaire (PHQ-9)

<table>
<thead>
<tr>
<th>Over the past 2 weeks have you been bothered by these problems?</th>
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<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Little interest or pleasure in doing things</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Trouble falling or staying asleep, or sleeping too much?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Feeling tired or having little energy?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Poor appetite or overeating?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Feeling bad about yourself - or that you are a failure or have let yourself or your family down?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Trouble concentrating on things, such as reading the newspaper or watching television?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Moving or speaking so slowly that other people could have noticed? Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Thoughts that you would be better off dead, or of hurting yourself in some way?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PHQ-9 Copyright © 1999 Pfizer Inc

Spitzer RL JAMA 1999
Outpatient Screening Using PHQ-9

<table>
<thead>
<tr>
<th>Total Score</th>
<th>Depression Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>Minimal Depression</td>
</tr>
<tr>
<td>5-9</td>
<td>Mild Depression</td>
</tr>
<tr>
<td>10-14</td>
<td>Moderate Depression</td>
</tr>
<tr>
<td>15-19</td>
<td>Moderately Severe Depression</td>
</tr>
<tr>
<td>20-27</td>
<td>Severe Depression</td>
</tr>
</tbody>
</table>

PHQ-9 score ≥10 had 91% sensitivity and 89% specificity for major depression, and 78% sensitivity and 96% specificity for any depression diagnosis.

Used as a diagnostic assessment, with major depression diagnosed if > 5 of the 9 symptoms have been present at least more than half the days of the past 2 weeks and 1 of these symptoms is either depressed mood or anhedonia.

Williams LS et al Stroke 2005

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To study the utility of PHQ-2 screening tool in the acute phase after stroke in predicting post stroke depression.

**Study Design**
Retrospective cohort study of patients hospitalized with acute stroke who were screened for depressive symptoms.

**Study Sample**
**Inclusion Criteria:** patients with principal discharge diagnosis of ischemic or hemorrhagic stroke discharged between January – December 2013.

**Exclusion criteria:** age <18 years, elective admissions, subarachnoid hemorrhage or TIA, and in-hospital death.
Objectives

- Determine prevalence of positive depression screen in the in-hospital setting as assessed with PHQ-2
- Identify reasons PHQ-2 was not captured in-hospital
- Determine the level of agreement between a positive screen for depression (PHQ-2 ≥ 3) in the in-hospital setting and in outpatient follow-up appointment (PHQ-9 ≥ 10)
- Assess characteristics of patients in which there was discrepancy between results of in-hospital and outpatient follow-up screen
- Identify patient characteristics that are associated with positive PHQ-9 screen for depression (PHQ9 > 10) at outpatient follow-up

Summary of Results

- 718 patients met criteria for inclusion in the study
- In-hospital PHQ-2 (PHQ-4) data was available for 50%
### Results:
Comparison between the two groups

<table>
<thead>
<tr>
<th></th>
<th>All Patients</th>
<th>PHQ-4 Completed</th>
<th>PHQ-4 Not Completed</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N</strong></td>
<td>718</td>
<td>358</td>
<td>360</td>
<td></td>
</tr>
<tr>
<td><strong>Age</strong> Mean (SD)</td>
<td>67.3 (14.9)</td>
<td>66.3 (14.9)</td>
<td>68.3 (14.8)</td>
<td>0.0845</td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td>368 (51.3)</td>
<td>185 (51.7)</td>
<td>183 (50.8)</td>
<td>0.8798</td>
</tr>
<tr>
<td><strong>Race:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>431 (60.0)</td>
<td>221 (61.7)</td>
<td>210 (58.3)</td>
<td>0.2649†</td>
</tr>
<tr>
<td>Black</td>
<td>244 (34.0)</td>
<td>116 (32.4)</td>
<td>128 (35.6)</td>
<td></td>
</tr>
<tr>
<td><strong>H/O of Depression</strong></td>
<td>116 (16.2)</td>
<td>60 (16.8)</td>
<td>56 (15.6)</td>
<td>0.7361</td>
</tr>
<tr>
<td><strong>H/O of Anxiety</strong></td>
<td>40 (5.6)</td>
<td>22 (6.1)</td>
<td>18 (5.0)</td>
<td>0.6127</td>
</tr>
</tbody>
</table>

**Results:** Comparison between the two groups

<table>
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<tr>
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<td><strong>N</strong></td>
<td>718</td>
<td>358</td>
<td>360</td>
<td></td>
</tr>
<tr>
<td><strong>Stroke Type:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ischemic</td>
<td>532 (74.1)</td>
<td>284 (79.3)</td>
<td>248 (68.9)</td>
<td>0.0019</td>
</tr>
<tr>
<td>ICH</td>
<td>186 (25.9)</td>
<td>74 (20.7)</td>
<td>112 (31.1)</td>
<td></td>
</tr>
<tr>
<td><strong>Length of Stay</strong></td>
<td>Mean (SD)</td>
<td></td>
<td></td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>7.5 (7.2)</td>
<td>6 (4.8)</td>
<td>9 (8.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ICU Stay</strong> Mean (SD)</td>
<td>2.7 (4.9)</td>
<td>1.5 (2.4)</td>
<td>4 (6.3)</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td><strong>Discharge Rankin</strong></td>
<td>&lt;1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>154 (21.4)</td>
<td>83 (23.2)</td>
<td>71 (19.7)</td>
<td>&lt; 0.0001†</td>
<td></td>
</tr>
<tr>
<td>2-5</td>
<td>564 (78.6)</td>
<td>275 (76.8)</td>
<td>289 (80.3)</td>
<td></td>
</tr>
<tr>
<td><strong>Admission NIHSS</strong></td>
<td>Mean (SD)</td>
<td></td>
<td></td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>8.4 (8.3)</td>
<td>5.8 (5.8)</td>
<td>11.2 (9.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>NIHSS Aphasia 0</strong></td>
<td></td>
<td></td>
<td></td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>412 (57.4)</td>
<td>272 (76.0)</td>
<td>140 (38.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Discharge NIHSS</strong></td>
<td>Mean (SD)</td>
<td></td>
<td></td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>5.6 (6.7)</td>
<td>3.8 (4.5)</td>
<td>7.8 (8.3)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Results:
Prevalence of Depression and Anxiety In-hospital

The median time from date of admission to administration of the PHQ-4 was **3 days** (interquartile range [IQR] = 1-4 days).

4.7% (95% CI 2.8% - 7.5%) 17/358 screened positive for depression

6.1% (95% CI 3.9% - 9.2%) 22/358 screened positive for anxiety.

Results:
Prevalence of Depression at Outpatient Follow-up

Median time from hospital discharge to the follow-up outpatient visit was **34 days** (IQR = 28–47 days)

20.8% (95% CI 16.0% - 26.2%) 54/260 screened positive for depression using PHQ-2 cutoff ≥3

22.3% (95% CI 17.4% - 27.9%) 58/260 screened positive for depression using PHQ-9 cutoff ≥10
Overall Results

Inpatient and Outpatient PHQ-2

Results:
Inpatient and Outpatient PHQ-2
**Results:**
Comparison Of Inpatient And Outpatient Depression Prevalence

<table>
<thead>
<tr>
<th>Outpatient Follow-up visit</th>
<th>PHQ-9 Screen</th>
<th>PHQ-2 Screen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive screen (PHQ-9≥10)</td>
<td>4 (66.7%)</td>
<td>3 (50%)</td>
</tr>
<tr>
<td>Negative screen (PHQ-9&lt;10)</td>
<td>2 (33.3%)</td>
<td>3 (50%)</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

| Positive screen (PHQ-2≥3) | 25 (17.4%) | 144 | 169 |
| Negative screen (PHQ-2<3) | 119 (82.6%) | 121 | 240 |
| Total                     | 144         | 240 | 384 |

**Depression Screen Results According History of Depression/Antidepressant Before Stroke**

![Graph showing percentage of positive screens]
### Conclusions

Systematic screening for depression using the PHQ-2 tool in the acute in-hospital phase following stroke in a large tertiary care center yielded a very low prevalence rate of depression. Most patients with depressive symptoms were identified only at the time of outpatient follow up.

Further study is needed to evaluate the usefulness of other depression screens for stroke patients in the acute hospital setting and the optimal timing for depression screening after stroke.
Thank You