Postacute Reevaluation May Prevent Dysphagia-Associated Morbidity

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Background and Purpose—Accurate identification and tailored management of patients with dysphagia is necessary to prevent complications when dysphagia is present and avoid implications of dietary restriction when unnecessary. Methods of dysphagia assessment vary, and a reassessment in the postacute period is not an established standard. The aim of this retrospective study was to compare initial dysphagia assessment with dysphagia reassessment results for stroke patients admitted to our inpatient rehabilitation facility.

Methods—We examined medical records of 226 acute stroke patients admitted to our inpatient rehabilitation facility from December 2006 to May 2007. We excluded 86 subjects, then noted the presence or absence of dysphagia based on documentation and prescribed diet and management strategies in the remaining 146 records.

Results—Dysphagia was identified in 94 patients (64%) assessed at our facility. Of these patients, 11% (n=10) were not previously identified in acute care (nonnegligible number, P<0.0001). Agreement regarding presence or absence of dysphagia occurred in 85%. However, prescribed diet differed in 51% (n=75), with 12% (n=18) requiring diet downgrades on admission for rehabilitation.

Conclusions—The necessity of dysphagia reassessment as part of routine postacute stroke rehabilitation care is not completely established. Our study supports the need for postacute reassessment as 11% of patients with dysphagia would not have been identified without reassessment and 12% required diets more conservative than prescribed in acute care. Prospective research addressing dysphagia specific outcomes is warranted to develop efficient and high-quality standards for preventing poststroke dysphagia associated morbidity. (Stroke. 2009;40:1381-1385.)

Key Words: acute care ■ acute stroke ■ cerebrovascular accident ■ diagnostic methods ■ dysphagia ■ organized stroke care ■ prevention ■ quality of life ■ stroke care ■ morbidity ■ postacute care

Of the 780,000 people in the United States per year who suffer a stroke,1 between 37% and 78% are estimated to suffer from dysphagia (swallowing disorder), depending on the type of assessment used.2 Dysphagia can manifest during any of the 3 phases (oral, pharyngeal, and esophageal) of swallowing. Complications of dysphagia include aspiration, which can lead to aspiration pneumonia and increase the risk of death by more than 5-fold,3 and malnutrition, which is associated with poor outcome and slowed rate of recovery.3,6,7

Early evaluation for dysphagia has significantly decreased the incidence of aspiration pneumonia in stroke patients,5 however a universal standard protocol for assessment has not been fully defined. The National Clinical Guidelines for Stroke recommend a clinical assessment by a trained specialist, such as a speech and language pathologist (SLP), who should advise an appropriate consistency of solids and fluids for safe swallow.6 This clinical assessment, consisting of examination of voluntary movements of the mouth and throat as well as observation of the swallowing of solids and liquids of various consistencies, often occurs at the bedside. However, clinical or bedside assessment alone has been shown to be a poor predictor of pharyngeal dysphagia,8,9,10,11,12 and reliance on these assessments without other objective radiographic studies has been said to be “unsupportable.”13 The videoflouroscopic swallow study (VFSS) or modified barium swallow (MBS), which evaluates the oral, pharyngeal, and early esophageal phases of swallowing, is a universally accepted clinical gold standard for assessment of dysphagia14,15 (though some studies have shown variable test–retest reliability16,17). Flexible/fiberoptic endoscopic examination of swallow (FEES), or FEES with added sensory testing (FEESST), may be used for dysphagia assessment at some institutions, but there is not sufficient evidence to support its use as an acceptable alternative gold standard to VFSS.18

VFSS has advantages beyond identification of aspiration, including the ability to observe the effectiveness of compensatory swallowing strategies (eg, multiple swallows, chin tuck, etc) as well as the visualization of swallowing pathology other than aspiration.19 Furthermore, Martin-Harris et al found as many as 83% of patients with dysphagia who undergo a VFSS may have a change in at least 1 of 5 clinical variables related to the dysphagia treatment plan including:

Received August 1, 2008; final revision received September 15, 2008; accepted September 19, 2008.

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Stroke is available at http://stroke.ahajournals.org

DOI: 10.1161/STROKEAHA.108.533489
referral to specialist, swallowing therapy, compensatory swallowing strategies, mode of nutritional intake, and diet. Although errors of inappropriate dysphagia management may occur commonly with clinical swallow assessment alone, placing poststroke patients at risk of dysphagia-related morbidity and mortality, one may argue that obtaining a VFSS in the first days after stroke may result in excessive cost in lost time for other diagnostic evaluations to prevent recurrent events. Furthermore, some patients may not be sufficiently alert or otherwise able to cooperate meaningfully with a VFSS in the early acute period. High morbidity and mortality associated with complications of dysphagia as well as time and costs associated with VFSS steer many institutions toward using clinical assessment alone with highly conservative management of symptomatic or high-risk patients. However, restricting patients to diets of altered consistency or prohibiting oral feeding in patients for whom these restrictions are unnecessary is also undesirable. Unnatural feeding can lead to discomfort, distortion of self-image, and severe psychological distress. If food is less palatable, the pleasure of eating may be reduced, which has been reported to diminish quality of life. Therefore, accurate identification and tailored management of patients with dysphagia are of utmost importance, because of the need to prevent the complications of dysphagia when present as well as the need to avoid the implications of dietary restriction when such restriction is unnecessary.

Many patients transfer from an acute to postacute hospital setting during their stroke care. Whether the transition from acute to postacute inpatient care appropriately includes swallowing reassessment is undefined. In some postacute rehabilitation settings, a new decision process regarding dysphagia assessment may not be considered necessary or cost effective. However, documentation of initial dysphagia assessment is not always included in transfer records, even when a modified diet indicates suspected or diagnosed dysphagia. Although consensus statements suggest ongoing monitoring and evaluation of swallowing, specific guidelines for dysphagia reassessment during inpatient stroke rehabilitation are not available. To manage stroke patients with possible dysphagia efficiently and safely, our institution developed a protocol for clinical reassessment. A high percentage of these patients go on to have a VFSS. Based on a clinical impression over several years of the effectiveness of dysphagia reassessment in identifying patients at risk of aspiration, we wished to retrospectively compare initial acute care dysphagia assessment with dysphagia reassessment results for stroke patients admitted to our inpatient rehabilitation facility. We hypothesized that differences in dysphagia identification and management between initial and reassessment would exceed those expected as a result of interim natural recovery, and that dysphagia reassessment would detect dysphagia not identified on initial screening.

**Methods**

Our center, the Kessler Institute for Rehabilitation Saddle Brook facility (KIRSB) is a freestanding inpatient rehabilitation hospital located in Saddle Brook, NJ, which admits stroke patients immediately after the acute care hospitalization. Stroke patients participate in an interdisciplinary rehabilitation program that includes at least 3 hours of therapy a day, 6 days per week, for an average of 2 to 3 weeks. Goals include maximizing recovery and functional independence, training of caregivers, and patient and family education.

We retrospectively identified patient records for this study from a list of all patients with a diagnosis of acute stroke admitted to KIRSB from December 2006 to May 2007, obtained from eRehab Data, an inpatient rehabilitation outcomes database sponsored by the American Medical Rehabilitation Providers Association (AMRPA). We examined hard copy charts of the first 226 patient records obtained, along with electronic medical records and acute care hospital transfer records. Each subject was deidentified, and protected health information was secured according to our institutional guidelines and policies. Information collected for each subject was recorded on a separate case report file. Twenty-one subjects were excluded when we determined there was no actual diagnosis of acute stroke (n = 17) or for unavailability of the medical records (n = 4). Twenty-two charts documented care for patients who were transferred back to the acute care setting and then later readmitted to KIRSB during the above stated timeframe. Subjects with readmissions to our facility were represented only once in our data analysis. Four of these subjects were found to have an additional acute stroke as their reason for transfer, and only data from their first admission was included. The remaining 18 of these subjects were transferred for reasons other than a new acute stroke (eg, infection). Data from both KIRSB admissions was collapsed in subjects who had been transferred back to acute care early in their postacute rehabilitation stay (within the first few days) and who completed dysphagia assessment on return. If the transfer occurred beyond the first few days of rehabilitation, then only our initial admission dysphagia assessment was used. We could not find documentation of dysphagia reassessment at KIRSB for 37 patients who were also excluded from data analysis.

In the remaining 146 charts, we noted the presence or absence of dysphagia based on prescribed diet on transfer to rehabilitation, review of diagnoses listed in transfer records, and progress notes when provided (see Figure). We considered subjects admitted with NPO status who had no other stated medical reason for such status to have been given a diagnosis of dysphagia in acute care. Also, we considered patients who had been prescribed a diet of altered consistency, such as thickened liquids or pureed food, without other stated reason for such restrictions to have been given a diagnosis of dysphagia in acute care. It should be noted that 2 subjects had been prescribed a diet of mechanically soft solids because of the fact that they were edentulous. We did not consider these subjects to have a...
Table 1. General Characteristics of Stroke Patient Sample

<table>
<thead>
<tr>
<th>Demographic (n=146)</th>
<th>% Women</th>
<th>46</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Men</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>Age at admission</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean age in years (SD)</td>
<td>72 (14.0)</td>
<td></td>
</tr>
<tr>
<td>Days from onset of stroke to rehab admission</td>
<td>11 (8.9)</td>
<td></td>
</tr>
<tr>
<td>Type of stroke (n=146)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Ischemic</td>
<td>87</td>
<td></td>
</tr>
<tr>
<td>% Hemorrhagic</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>% Unknown</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Diagnosis of dysphagia. Other information collected included: age at onset stroke; gender, type of stroke; length of time from onset of stroke to rehabilitation admission; type of dysphagia assessment performed in acute care; diet prescribed in acute care; dysphagia strategies and treatment prescribed in acute care; type of dysphagia assessment done at KIRSB; documented findings on dysphagia assessment at KIRSB; diet prescribed at KIRSB; and dysphagia strategies and treatment prescribed at KIRSB.

We examined change in diet prescription as a result of KIRSB assessment. Using a χ² goodness-of-fit test, we compared actual change with predicted change, figure generated from estimates of the proportion of subjects who might be expected to recover, based on published literature regarding the natural history of dysphagia.¹

Results

Of 146 qualifying subjects, 46% were women and 54% were men. Age ranged from 28 to 102 years, with a mean age of 72 at the time of admission. Average length of time from onset of stroke to inpatient rehabilitation admission was 11 days. The majority (87%) of subjects suffered ischemic strokes while 11% suffered primary hemorrhages. In 3 cases (2%), we could not determine stroke type from the records. Table 1 summarizes these general characteristics of our sample. For the documented location of stroke involvement, please refer to the supplemental Table 1, available online at http://stroke.ahajournals.org.

Documentation of initial dysphagia assessment during acute hospitalization is summarized in Table 2. In 36% of subjects, there was documentation that some type of dysphagia assessment was performed. “Clinical examination only” was documented in 10%, “VFSS only” in 13%, “clinical examination+VFSS” in 2%, “clinical examination+FEES” in 2%, and in 9% the type of assessment was not specified. In 64% of subjects, we found no documentation about dysphagia assessment in the acute care records provided on transfer to inpatient rehabilitation. In those patients, we determined whether dysphagia had been identified in acute care based on the prescribed diet on transfer to rehabilitation, review of diagnoses listed in transfer records, and progress notes when provided.

Once admitted to KIRSB, 68% of subjects (n=99) underwent a VFSS as part of our dysphagia reassessment protocol. The remaining 32% (n=47) had a clinical examination only to determine presence or absence of dysphagia. Table 3 summarizes dysphagia identification in acute care and KIRSB. Agreement regarding presence or absence of dysphagia occurred in 85% (124/146). Dysphagia was identified in 94 patients (64%) at KIRSB. Of these patients, 86% (n=81) were confirmed by VFSS and 11% (n=10) had not been previously identified in acute care. Twelve patients (8.2%) previously identified with dysphagia in acute care no longer had evidence of dysphagia when admitted for rehabilitation at KIRSB.

Table 4 highlights changes in diet on admission to KIRSB. Agreement in prescribed diet occurred in only 49% (n=71). The KIRSB dysphagia assessment resulted in a diet upgrade in 36% (n=53) and a downgrade in 12% (n=18). Four patients (3%) had either an upgrade in solids with concomitant downgrade in liquids (or the reverse) or a change in diet that could not be classified secondary to a liquid consistency prescribed in acute care that was less specific than the categories used at KIRSB (eg, “thickened liquids,” not otherwise specified). We predicted the proportion of patients in whom recovery would be expected based on published literature regarding the natural history of dysphagia.² The 18 patients who had diet downgrades on admission to KIRSB were in statistically significant excess over the hypothesized count of 1 patient using the exact χ² goodness-of-fit test for 1-way tables (P<0.0001).

Discussion

Dysphagia was common (64%) in this poststroke patient sample and was present in a proportion consistent with the upper limit of published statistics for the acute stroke period.² Little has been published about the natural history of post-

Table 2. Acute Care Documentation of Dysphagia Assessment

<table>
<thead>
<tr>
<th>(+) Documentation of dysphagia assessment</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical exam only</td>
<td>14</td>
<td>10%</td>
</tr>
<tr>
<td>VFSS only</td>
<td>19</td>
<td>13%</td>
</tr>
<tr>
<td>FEES only</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Clinical exam+VFSS</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
<td>Clinical exam+FEES</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
<td>Assessment not specified</td>
<td>13</td>
<td>9%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(−) Documentation of dysphagia assessment</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>94</td>
<td>64%</td>
<td></td>
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</table>

Table 3. Dysphagia Identification in Acute Care and at KIRSB

<table>
<thead>
<tr>
<th>KIRSB Dysphagia Pathway (+)</th>
<th>KIRSB Dysphagia Pathway (−)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute care (+) dysphagia</td>
<td>84</td>
<td>12</td>
</tr>
<tr>
<td>Acute care (−) dysphagia</td>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>94</td>
<td>52</td>
</tr>
</tbody>
</table>

Table 4. Changes in Diet Upon Admission to KIRSB

<table>
<thead>
<tr>
<th>n</th>
<th>Upgrade</th>
<th>Downgrade</th>
<th>Same</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>53</td>
<td>18</td>
<td>71</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>

% (actual) 36.3 12.3 48.6 2.7

% (predicted) 36 0.01 63.99 . . .
stroke dysphagia, and current references may underestimate its prevalence during the time period corresponding to inpatient rehabilitation. Overall characteristics of our sample seem to be representative of the general population of patients with stroke entering the postacute rehabilitation setting. Further research may be needed to ensure that the need for care of stroke survivors with dysphagia is appropriately estimated.

Based on the clinical assumption of the necessity for dysphagia reassessment at our center and others, and the lack of empirical objective data to support this assumption, we wished to examine a body of existing data to see whether reassessment in the postacute period is indeed important in stroke care. We chose to use a retrospective design to accomplish this aim, despite the fact that several confounders affect the objectivity of the medical record. Retrospective design is limited by the quality and completeness of the medical record data available, and therefore we did not expect this information to determine utility of dysphagia reassessment conclusively. Additionally, variability in timing between initial and reassessments, inability to use a standardized tool for dysphagia assessments, and biases resulting from the fact the postacute evaluators were not blinded to acute care assessment results may also potentially limit the validity of the study conclusions.

Documentation of initial acute care dysphagia assessment is not reliably included in transfer records for inpatient rehabilitation hospitals. In our study, transfer records for the majority of subjects (64%) did not include documentation of acute care dysphagia assessment. Adequate description of the dysphagia care plan is needed during transitions from acute settings to provide the highest quality care, especially because specific guidelines for dysphagia assessment during stroke rehabilitation do not exist, and reassessment of stroke patients may not be considered necessary or cost-effective in some postacute rehabilitation settings. At KIRSB, the majority of stroke patients are reassessed via clinical examination, a high percentage of which are confirmed via VFSS. If patient assessment during acute care were sufficient to identify dysphagia, then we should see differences between results of acute and KIRSB assessments only if accounted for to identify dysphagia, then we should see differences between results of acute and KIRSB assessments only if accounted for by natural recovery. Likewise, prescribed diet at KIRSB should be either the same as that prescribed in acute care or upgraded if recovery has taken place. We refer to these differences as “disagreement,” recognizing that agreement between acute and postacute assessments is not expected because dysphagia status is expected to change over time. However, new identification of dysphagia or downgrading of prescribed diet on admission to acute rehabilitation may reflect a failure to adequately detect dysphagia in the acute care setting. Although it is possible that patients who suffer from mild strokes that evolve over time may not show signs of dysphagia in the acute period, this only further supports reassessment in the postacute phase. In our study, 11% of patients with dysphagia would not have been identified without reassessment. This suggests that both initial assessment and later reassessment may be necessary for optimal care for dysphagia.

Agreement in prescribed diet between acute care and rehabilitation occurred in only 49%, suggesting a great need to repeat dysphagia assessments in the rehabilitation setting. A disturbing number of patients (12%, n = 18) required diets for swallowing safety more conservative than those prescribed in acute care. This proportion of diet downgrades on admission to KIRSB was a statistically significant excess over the <1% hypothesized using the exact χ² goodness-of-fit test for 1-way tables (P < 0.0001). Using published literature regarding the natural history of dysphagia, we predicted the proportion of patients who would be expected to show recovery (36%). As predicted, diet levels were upgraded on admission for rehabilitation in 36%. This proportion of diet upgrades likely represents changes attributable to interim natural recovery, though overly conservative management in acute care, perhaps attributable to inability of patients to cooperate with advanced diagnostic procedures, is also a possible explanation. Whether this trend represents recovery or overly conservative management is a question requiring prospective examination so that unnecessary dietary restriction can be avoided, especially because implications of such restriction can include malnutrition, discomfort, distortion of self-image, psychological distress, reduced pleasure of eating, and diminished quality of life.

Summary
A high percentage of stroke patients entering the postacute setting suffer from dysphagia, which is associated with great morbidity. A considerable proportion of these patients may not have been diagnosed during the acute hospitalization. Patients diagnosed with dysphagia in the acute period who have recovered substantially by the postacute period may be receiving unnecessary dietary restrictions, which also contribute to morbidity. The currently recommended process of swallow assessment is not standardized, and a complete swallow evaluation may appropriately include both initial and reassessment stages. Acute care clinicians should outline the request for dysphagia reassessment along with any other follow-up instructions to be included on transfer to postacute settings as part of quality continuity of poststroke care. Clinicians treating stroke patients in postacute inpatient settings should not consider results of prior dysphagia assessment to be conclusive. Our results support the need for reassessment on admission for postacute inpatient rehabilitation. We recommend prospective investigation of an assessment/reassessment protocol, which would include an initial acute assessment occurring within the first 14 days followed by a postacute reassessment conducted between weeks 2 to 8. Future research qualifying dysphagia severity and characteristics, severity of subjects’ neurological deficits, and addressing dysphagia specific outcomes will be necessary to develop efficient and high quality standards for preventing poststroke dysphagia associated morbidity.

Acknowledgments
The authors are grateful for the helpful suggestions for improvement of this manuscript provided by 3 anonymous reviewers, one of whom suggested we specifically recommend a standardized protocol for dysphagia assessment in the acute and postacute phases to be tested in future prospective investigation. The authors also acknowledge Dr
Sources of Funding

This research was conducted in conjunction with the Stroke Rehabilitation Fellowship program sponsored by the University of Medicine and Dentistry of New Jersey, and The Kessler Foundation. The above institutions sponsor the Stoke Rehabilitation Fellow, Kimberly Heckert, who conducted the research without additional specific funding sources. The work was also supported by the National Institutes of Health, National Institute of Neurological Disorders and Stroke (K02NS97099, Barrett).

Disclosures

None.

References
