Kansas Stroke Dysphagia Screening (KSDS): Development of an Evidence-Based Tool
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BACKGROUND
• Dysphagia is reported to occur in up to 55% of acute stroke patients with aspiration documented in 38%. Silent aspiration occurred in 67% of those patients (Daniels et al., 1998).
• Patients with severe dysphagia and aspiration are at 11 times greater risk of developing pneumonia (Sharma et al., 2001).
• Hospital acquired pneumonia (HAP) has been shown to be related to aspiration in up to 87% of cases (Teramoto et al., 2008).
• Per The Joint Commission (TJC), all patients admitted with a diagnosis of ischemic or hemorrhagic stroke should be screened for dysphagia prior to initiation of food, liquids, and medication (JCAHO, 2004).
• The Kansas Stroke Dysphagia Screening (KSDS) was developed and implemented in 2007 to meet TJC requirement.

KSDS DEVELOPMENT
Three screening tools influenced the design and implementation of the KSDS.
• Burke 3oz. Water Test (DePippo et al., 1994): high sensitivity for water challenge
• Massey Bedside Swallow Screening (Massey & Jedlicka, 2002): Yes/No decision tree; high sensitivity and specificity; history and physical state questions
• Simple Standardized Bedside Swallowing Assessment (SSA) (Perry, 2001): high sensitivity; described training of the end-user

Daniels et al. 2000 influenced the choice of clinical predictors of dysphagia

The KSDS includes a broad range of variables to determine not only if the patient shows overt signs of aspiration through a graduated water test, but also if the patient is at risk for aspiration based on history and physical state at time of screening (e.g. level of alertness, vocal quality, etc.).

IMPLEMENTATION
Training
• Initial training included:
  • lecture modules with post-test
  • 10 practice screenings
  Training schedule was not practical

• Current training includes:
  • RN users are trained through either lecture or computerized module with post-test.
• Neuroscience RNs serve as “super-users” and are available to answer questions 24/7.
• Neurology residents participate in a mandatory training module one time per year.

**Challenges**
• Monthly resident rotations and new residents annually pose training challenges in an academic medical center
• No single discipline “owns” the screening
• Transition to computerized charting makes screening less intuitive and more difficult to locate
• Compliance ranges from 63% to 94%.

**Objective**

Examine retrospective data to determine KSDS sensitivity and specificity.

**Subjects**

**Characteristics**

- Total consecutive patients from April –August 2009 = 155
- 59 met the inclusion criteria
- Failed KSDS =30; Passed KSDS = 29
- Female = 30; Male = 29
- Ischemic = 44; Hemorrhagic = 15
- Mean age of patients who failed = 55.6
- Mean age of patients who passed = 63.7

- Inclusion criteria: KSDS completed correctly; confirmed diagnosis of acute ischemic or hemorrhagic stroke on Brain CT or MRI scan; SLP Swallow Evaluation completed within 24 hours or less of KSDS
- Exclusion criteria: KSDS completed incorrectly; diagnosis of TIA; intubation (post KSDS completion); SLP Swallow Evaluation completed greater than 24 hours after KSDS
- Data collected via chart review covering the time period of April-August 2009
Results

<table>
<thead>
<tr>
<th>All Variables</th>
<th>Dysarthria Only</th>
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<tbody>
<tr>
<td>Sensitivity = 95.8</td>
<td>Sensitivity = 73.9</td>
</tr>
<tr>
<td>Specificity = 82.9</td>
<td>Specificity = 66.7</td>
</tr>
<tr>
<td>PPV = 79.3</td>
<td>PPV = 89.5</td>
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<tr>
<td>NPV = 96.7</td>
<td>NPV = 40.0</td>
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</tbody>
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Summary/ Conclusions

- Retrospective data analysis of the KSDS suggests that this tool is able to reliably identify the presence of dysphagia following a stroke.
- Presence of dysarthria was found to significantly distinguish patients with dysphagia from those without dysphagia.

Future Direction/Limitations

- Small sample size
- Difficulty with consistency of documentation
- Future research could examine the KSDS sensitivity/specificity through analysis of prospective data.

SELECTED REFERENCES


