An Oral Water Protocol in Rehabilitation Patients with Dysphagia for Liquids

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Benefits of Water Protocols

- Improved hydration
- Improved patient satisfaction and compliance
- Increased opportunity to practice swallowing
- Better recognition of improved swallowing
Debate exists...

- “The lungs are capable of absorbing water.”
- “Tap water’s nearly neutral pH should not cause a chemical injury to the mucosa of the lungs.”
- “Good oral hygiene may reduce the likelihood of pathogenic bacteria in the oral cavity”
- “Potential for lung damage, respiratory compromise, or pneumonia exists”
Only one published study...

- Garon, Engle and Ormiston, 1997
  - 20 acute stroke patients with identified thin liquid aspiration.
  - Control group=received thickened liquids only
  - Study group=received thickened liquids + water
  - No patient in either group developed pneumonia, dehydration, or other complications during their hospitalization or 30 days post-discharge.
Our study

Does the use of oral water protocols in Rehabilitation patients on thin liquid restrictions due to dysphagia yield differences in:

1. adverse event rates?
2. physical, cognitive and swallowing recovery?
3. length of hospitalization?
Our study

• Inclusion criterion:
  • Aspiration of liquids during videofluoroscopic swallow study

• Exclusion criteria:
  • ventilators
  • cuffed tracheostomy tubes (if inflated 100% of time)
  • noncompliance of swallowing recommendations
  • “super coughers”
  • total dependence for oral feeding
  • visibly decayed teeth
Stratification

Consent

Independent feeders (9)

Assisted feeders (17)
Randomization

Consent

Independent feeders (9)

Control group (3)

Study group (6)

Assisted feeders (17)

Control group (8)

Study group (9)
Methods

- Control group participants:
  - Received thickened liquids only, if permitted fluids by mouth
  - If NPO, allowed nothing by mouth
  - Received oral care 4 times/day

- Study group participants:
  - Received thickened liquids only at mealtime, if permitted fluids by mouth
  - **Outside of medication or meal times, permitted unlimited oral water or ice**
  - If NPO status, allowed nothing by mouth, **except unlimited oral water or ice.**
  - Received oral care 4 times/day
Results...

- **Subjects:**
  - 26 adult Rehabilitation patients
  - **Admitting diagnoses:**
    - stroke (N=16)
    - brain injury (N=3)
    - cardiac surgery (N=3)
    - brain surgery (N=1)
    - fall (N=1)
    - seizures (N=1).
Table 1a: Summary of Baseline Demographic Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Independent</th>
<th>Assisted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Case (n=6)</td>
<td>Control (n=3)</td>
</tr>
<tr>
<td>Mean Age (S.D.)</td>
<td>76.8 (15.8)</td>
<td>71.7 (9.5)</td>
</tr>
<tr>
<td>Sex (% Male)</td>
<td>83.3%</td>
<td>66.7%</td>
</tr>
<tr>
<td>Race (% Caucasian)</td>
<td>83.3%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Marital Status (% Married)</td>
<td>16.7%</td>
<td>33.3%</td>
</tr>
<tr>
<td>Type of Residence admitted from:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home, lived alone</td>
<td>50.0%</td>
<td>33.3%</td>
</tr>
<tr>
<td>Home, lived with another</td>
<td>50.0%</td>
<td>67.7%</td>
</tr>
<tr>
<td>Caregiver’s home or Assisted Living</td>
<td>0.0%</td>
<td>0.0%</td>
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</tbody>
</table>
Table 1b: Summary of Baseline Health Status

<table>
<thead>
<tr>
<th>Variable</th>
<th>Independent</th>
<th></th>
<th>Assisted</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Study (n=6)</td>
<td>Control (n=3)</td>
<td>Study (n=9)</td>
</tr>
<tr>
<td>Total Mean FIM Scores</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Mean Motor Score</td>
<td>43.7</td>
<td>49.0</td>
<td>32.7</td>
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<tr>
<td>• Mean Cognitive Score</td>
<td>23.2</td>
<td>24.0</td>
<td>20.4</td>
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<tr>
<td>• Mean Total FIM Score</td>
<td>66.8</td>
<td>73.0</td>
<td>53.1</td>
</tr>
<tr>
<td>FCM Score &lt; 4 (%)</td>
<td>16.7%</td>
<td>0.0%</td>
<td>44.4%</td>
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<tr>
<td>NPO (%)</td>
<td>0.0%</td>
<td>0.0%</td>
<td>44.4%</td>
</tr>
<tr>
<td>Feeding Tubes (%)</td>
<td>33.3%</td>
<td>0.0%</td>
<td>55.6%</td>
</tr>
<tr>
<td>Stroke (%)</td>
<td>83.3%</td>
<td>100.0%</td>
<td>55.6%</td>
</tr>
<tr>
<td>Pneumonia (%)</td>
<td>66.7%</td>
<td>0.0%</td>
<td>11.1%</td>
</tr>
</tbody>
</table>
Results

1. Does the use of oral water protocols ...yield differences in adverse event rates?
Results

- Adverse events-during hospitalization or 30 days after discharge
  - A. Pneumonia
    - Control group (1), Day 1 after discharge
    - Study group (1)
  - B. Urinary Tract Infection
    - Control group (2)
    - Study group (2)
  - C. Death
    - Study group (2)
Results

2. ... differences in physical, cognitive and swallowing recovery?
Results

- Physical and cognitive recovery: change in FIMs scores
  - No significant treatment effect

- Swallowing recovery: changes in FCMs swallowing scores
  - No significant treatment effect
Results

3. Does the use of oral water protocols...yield differences in length of hospitalization?
All Patients: Duration of Stay

Means: Water 15.8 days; Controls 29.1 days

Median: Water 16 days

Median: Controls 27 days
Dependent Feeding Strata: Duration of Stay

Water Protocol (n=9)  
Control (n=8)

Medians: Water 18 days; Controls 41 days

Means: Water 17.8 days; Controls 34.7 days
Why was length of stay reduced for the study group?

- Benefits of water protocol?
  - Amount of water
  - Composition of water
  - Effect on oral hygiene
  - Psychological benefits
Average Daily Fluid Intake by Strata and Treatment

Independent patients consumed significantly less than the dependent patients. (P-value = 0.008)
Conclusions

- Water protocols may be beneficial for patients with dysphagia for liquids
  - Shorter length of stay
  - No significant difference in adverse events
- Precautions
  - Attention to hydration and other adverse events
    - Standard nursing practices: e.g. monitoring I/O and weights
  - Competence and compliance with protocol
    - Oral health care
Precautions

- Not appropriate for everyone
- Careful consideration of patients with:
  - medically fragile
  - pulmonary disease
Precautions

- Clinical judgment and best practice patterns should always be exercised
  - Implement or not?
  - Ice vs. water?
  - Cup vs. spoon?
- Physician and SLP should be in agreement for all enrolled in protocol and engage in ongoing dialogue re: case management
- SLP should be included to oversee dysphagia and train staff/patient/family on protocol
What’s next?

- Neuroscience Unit
  - Frequent interaction with Rehabilitation Unit
  - Thorough in-servicing of all nursing staff