Discovery and Determination of Naturally Thick Liquids: Developing a Viscosity Continuum

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Current Concerns

• **Continuity of viscosity from assessment**
  - Christoffersen, Sargent, Halley, Murdoch, & Cichero, 2002; Cichero, Jackson, Halley, & Murdoch, 2000; Costa, de Almeida, Sant’Anna, & Pinheiro, 2007; OuldEleya & Gunasekaran, 2007

• **Uniformity within standardized ranges**
  - either Varibar® or the National Dysphagia Diet (NDD)
    - Garcia, Chambers, Matta, & Clark, 2005; O’Donoghue, Gloeckner, & Miller, 2007; Strowd, Kyzima, Pillsbury, Valley, & Rubin, 2008

• **Evidence-based information**
  - Coyle, Easterling, Lefton-Greif, & Mackay, 2007; Smith, 2007

• **Objective and reliable means to determine viscosity**
  - Dewar & Joyce, 2005; Glassburn & Deem, 1998; Mann & Wong, 1996; Steele, Van Lieshout, & Goff, 2003
Current Practice Patterns

- **Subjective thickening**
  - Unreliable in both identification and preparation
    - Steele, Van Lieshout, & Goff, 2003; Glassburn & Deem, 1998
  - Not intuitive (skim vs. whole milk)

- **Proposed solutions**
  - Prethickened liquids
  - Cost incurred
  - Only one study investigating if consistent with NDD
    - Strowd, Kyzima, Pillsbury, Valley, & Rubin, 2008

- **Recipes**
  - Varies by base material, temperature, thickener base, thickener brand
Research Questions

1) What themes emerge during SLP education to patients/family members regarding thickened liquids?

2) Are there natural state liquids comparable to Varibar® nectar and honey thicknesses?
Methods
Design

- Exploratory Taxonomy Development Model

- Two themes from pilot interviews selected for further study:
  - Natural state liquid exemplars
  - Thickness changes along a continuous scale in tx

- IRB approval received
Research Question 1: Interviews of SLPs Regarding the Education Process of Thickened Liquids

- Semi-structured interviews of 4 experienced SLPs
- Interviews coded, themes extracted

Research Question 2: Natural State Nectar and Honey Liquids (comparable to Varibar®)

- Compared with Varibar® standards (shear rate 30s⁻¹)
- Room temperature
- Measured torque and centipose for each sample at 2 and 3 minutes; recorded average
Results
Themes Extracted

- Six themes discussed in all 4 interviews
  - Use of visual aids
  - Naturally thick exemplars
  - Thickener properties and information
  - Demonstration coupled with supervised practice
  - Concerns of sequelae
  - Caution with implementation of honey and pudding thicknesses
Themes Continued

• Additional 5 themes discussed in 3 interviews

  1) Explanation of normal swallow

  2) Description of impairments specific to pt

  3) Concept of viscosity as a continuum rather than discrete categories

  4) Pairing thick liquids with other traditional treatments

  5) Prioritizing education
Viscometry Results

- 53 materials tested
- 25 did not reach torque
  - Potentially thin liquids
  - E.g., Ensure®, V8®, Santa Cruz® apricot nectar
- 21 items within Varibar® ranges
  - 7 nectars
  - 10 thin honeys
  - 4 honeys
- 6 items between Varibar® ranges
  - (1 item in pudding range)
Conclusions
Conclusions

- Educational and Practice themes inform how SLPs provide education & use thickened liquids
  - Naturally thick exemplars
  - Viscosity along a continuum during tx

- There are natural state liquids comparable to Varibar® nectar and honey thicknesses
  - 21 that reached torque and plotted on continuum
Potential Clinical Applications

- Connect instrumental assessment with follow-through
- Improve uniformity within and across settings
- Inform educational process with evidence for natural state examples
  - SLPs to pts
  - As well as facility training for dietary liquid selection
  - Training materials
Potential Applications Cont’d

- Inform treatment process with materials for tx as well as evidence to document progress
- Reduce dependence on unreliable and costly thickening agents
- Improve quality of life and compliance
Future Directions

- Compare naturally thick liquids against NDD standards
- More nationally accessible items
- Viscometry of less than nectar thick items on low-viscosity rheometer
- Addition of density and yield stress
- Viscosity at suggested serving temperature
- Batch-to-batch and national variability of products
- Explore use of continuum clinically
References


References Cont’d


