CLINICAL EVIDENCE



The effect of liquid consistency on penetration-aspiration: a Bayesian analysis of two large datasets.

Borders JC, Steele CM. The effect of liquid consistency on penetration-aspiration: a Bayesian analysis of two large datasets. Front Rehabil Sci. 2024 Feb 23;5:1337971. doi: 10.3389/fresc.2024.1337971

Objective

The study aimed to examine patterns of airway invasion across liquid consistencies using a Bayesian multilevel ordinal regression model approach.

Materials and Methods:

Two large datasets involving 11.592 bolus from 855 adults were analysed

Dataset D1:

- The dataset included a total of 8,185 bolus-level PAS ratings from 678 adults with reported dysphagia symptoms with neurological diagnosis or age >50
- ➤ All participants underwent videofluoroscopy involving ≥3 boluses across 4 consistencies: Thin (IDDSI Level 0), Mildly (IDDSI Level 2), Moderately (IDDSI Level 3), and Extremely thick (IDDSI Level 4)
- ThickenUp® Clear was used to thicken liquids
- > A total of 8,185 boluses were analysed



Materials and Methods:

Dataset D2:

- 3,407 bolus-level PAS ratings from 177 adults suspected dysphagia and nominally healthy, were included
- > All participants underwent videofluoroscopy involving ≥3 boluses across 4 consistencies: Thin (IDDSI Level 0), Slightly thick (IDDSI Level 1), Mildly (IDDSI Level 2), Moderately (IDDSI Level 3), and Extremely thick (IDDIS Level 4),
- ThickenUp® Clear & ThickenUp® were used to thicken liquids
- A total of 3,407 boluses were analysed



• The rating procedures for both datasets were identical and conducted in the same central analysis lab, ensuring a high degree of rigor.

Results:

Results from Dataset D1:

- Thin liquid boluses had a higher probability of PAS scores > 2 (10.55%) compared to mildly (4.25%), moderately (1.53%), and extremely thick (0.66%) consistencies.
- Among participants with at least one trial of airway invasion on thin liquids, the probability of a score of concern (PAS > 2) was substantially higher for thin liquid boluses (53.11%) compared to mildly (28.9%), moderately (11.68%), and extremely thick (5.84%) consistencies.
- Results from Dataset D2:
 - Thin liquid boluses had a higher probability of PAS scores > 2 (1.75%) compared to slightly (0.65%), mildly (0.46%), moderately (0.18%), and extremely thick (0.12%) consistencies.
 - Among participants with at least one trial of airway invasion on thin liquids, the probability of a score of concern (PAS > 2) was higher for thin liquid boluses (52.89%) compared to slightly (20.92%), mildly (18.5%), moderately (8.14%), and extremely thick (4.69%) consistencies.
 - Thickened liquids, whether prepared with ThickenUp® Clear or ThickenUp®, had similar probabilities of scores of concern (PAS > 2), with rates of 0.23% (95% CI: 0.08, 0.47) and 0.31% (95% CI: 0.11, 0.62) respectively, indicationg no significant differences between products.

This article presents robust confirmatory evidence derived from a substantial pooled sample, demonstrating that thicker liquid consistencies, specifically those thickened with ThickenUp® Clear and ThickenUp®, significantly reduce the likelihood of penetration and aspiration when compared to thin liquids.