The Volume-Viscosity Swallow Test for Clinical Screening of Dysphagia and Aspiration

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Oropharyngeal dysphagia is a major complaint among many patients with neurological diseases and in the elderly, but is often underdiagnosed [1]. It is necessary to develop clinical screening methods with high diagnostic accuracy to recognize and follow up patients with oropharyngeal dysphagia, to identify patients who are at risk of aspiration or malnutrition, to identify patients who should be referred for a videofluoroscopy to assess swallow function and to help select the most appropriate bolus volume and viscosity for those patients who cannot easily undergo a videofluoroscopy [2]. The volume-viscosity swallow test (V-VST) is a bedside method to screen patients for dysphagia [3].

The V-VST was designed as an effort test to identify clinical signs of impaired efficacy (efficacy of labial seal, presence of oral or pharyngeal residue and presence of piecemeal deglutition) and safety (voice changes, cough and decrease in oxygen saturation ≥3%) of swallow. To protect the safety of patients, the test starts with nectar viscosity (295 mPa s) and increasing bolus volumes (from 5 to 10 and 20 ml) in a progression of increasing difficulty. If patients complete the nectar series without major symptoms of aspiration, a less safe liquid viscosity (21 mPa s) series is assessed and, finally, a safer pudding viscosity (3,682 mPa s) series is performed in the same way (fig. 1). If the patient presents signs of impaired safety at nectar viscosity, the series is interrupted, the liquid series is omitted, and a more safe pudding viscosity series is assessed and, if the patient presented signs of impaired safety at liquid viscosity, the liquid series is interrupted and the pudding series is assessed. Two extra viscosities (conservative spoon-thick 1,098 mPa s consistency, and honey 766 mPa s) can be added to the end of the algorithm of the V-VST to evaluate the minimum amount of thickener needed to allow a safe and effective swallow.

The V-VST is a quick (it takes 5–10 min to complete), safe and accurate screening procedure for dysphagia in hospitalized and independently
living patients with multiple etiologies, and improves the management of dysphagic patients. The V-VST presents a sensitivity of 88.2% and a specificity of 64.7% to detect clinical signs of impaired safety of swallow (aspiration or penetration) and a sensitivity of 100% in recognizing patients with aspiration, subsequently confirmed by videofluoroscopy. By means of the V-VST, signs of oropharyngeal dysphagia were detected in 27.2% of independently living older persons \[4\] and 61.2% of acute poststroke patients \[5\].

The V-VST combines good psychometric properties, feasibility, a detailed and easy-to-perform protocol, an algorithm designed to protect the safety of patients, validated end points to evaluate safety and efficacy of swallowing and a system to detect silent aspirations. The V-VST detects patients who need a full diagnostic study and changes in diet – including recommendation of viscosity adaptation of fluids by thickeners – when videofluoroscopic examination is not possible. Therefore, we believe that the V-VST is an excellent clinical tool to screen patients for dysphagia.

Fig. 1. V-VST short algorithm. Left diagram: patients with safe swallow completed the pathway. Middle diagram: representative pathway for patients with impaired safety at 10 ml nectar. Right diagram: representative pathway for patients with impaired safety at 10 ml liquid.
References