

Distinct acoustic features in spinal and bulbar muscular atrophy patients with laryngospasm.

Tanaka S, Banno H, Katsuno M, Suzuki K, Suga N, Hashizume A, Mano T, Araki A, Watanabe H, Adachi H, Tatsumi H, Yamamoto M, Sobue G.

Abstract

OBJECTIVE:

Laryngospasm is a sudden onset of transient respiratory difficulty that is perceived as life-threatening by patients with spinal and bulbar muscular atrophy (SBMA). The purpose of the study was to analyze the voice characteristics of SBMA patients with laryngospasm using acoustic voice analysis.

METHODS:

Acoustic measurements were obtained from 39 consecutive Japanese patients with genetically confirmed SBMA. A comparison was made between the acoustic voice profiles of 16 patients with laryngospasm and 23 patients without laryngospasm within 6 months before the evaluation. Computerized acoustic analysis was performed for a prolonged vowel (/a:/) using the Multi-Dimensional Voice Program (MDVP).

RESULTS:

SBMA patients with laryngospasm had smaller fluctuations of vocal fold vibration and the turbulent noise component, indicating stronger vocal fold closure than in those without laryngospasm. Receiver operating characteristic curve analysis showed that the noise-to-harmonic ratio, which globally measures the noise components of voice, is the most useful acoustic parameter to distinguish laryngospasm (area under the curve = 0.767, $p = 0.007$).

CONCLUSIONS:

The smaller noise component in patients with laryngospasm suggests that the vocal folds of these patients are more adducted during phonation than those of the patients without laryngospasm, even in the absence of laryngospasm. Quantitative laryngeal analysis using the MDVP helps to detect laryngeal dysfunction and provides physiological insight into the pathophysiology of laryngospasm in SBMA.