

Vibration response imaging (VRI) in subjects presenting for methacholine challenge testing (MCT)

R. Mor, Z. Yemini, H. Frost, J. Greif (Tel Aviv, Israel)

Airway hyper-responsiveness (AHR) comprises a key component of the definition of asthma, and clinicians increasingly use airway challenge tests such as the MTC to establish the diagnosis. MTC are time consuming and cause discomfort. Poor patient effort during pulmonary function testing can produce false-positive results. Vibration response imaging (VRI) technology provides a radiation free dynamic image of the lung, by visualizing vibration energy (lung sounds) emitted during the respiratory cycle.

Study objective: to determine whether changes seen in VRI in MCT positive patients correlate with spirometric changes and whether baseline appearance of the VRI is predictive of the MTC results.

Methods

VRI: Acoustic sensors are mounted in a sensor matrix, which is attached to the patient's back by a vacuum method. The signals are transmitted to the hardware board. The analog signals are then processed and proprietary algorithms generate a dynamic lung image.

Metacholine challenge: was done in a closed system (PARI) using increased doses of Metacholine until PC20 was achieved. VRI was done at baseline, after challenge and post bronchodilator administration.

Results: 10 patients (mean age), Males Females were examined. 7 pts had a negative MTC. VRI didn't show any difference between baseline and post MTC in these pts. In 3 MTC positive pts. the VRI showed an overall decrease of vibration response (%) after the challenge as compared to baseline image.

Conclusions: Our preliminary data suggests a good correlation between the VRI and spirometric changes in cases of AHR with positive MCT. Further studies are necessary to confirm these findings and to evaluate if baseline appearance of the VRI is predictive of the MTC results.