

# European Respiratory Society Annual Congress 2012

**Abstract Number:** 1137

**Publication Number:** P4137

**Abstract Group:** 7.5. Neonatology and Paediatric Intensive Care

**Keyword 1:** Infants **Keyword 2:** Lung function testing **Keyword 3:** Wheezing

**Title:** Computerized quantification of wheezing in neonates: Relationship with conventional lung function parameters

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**Body:** Objective: Computerized respiratory sound analysis has been used to evaluate wheeze in infants, but it is not known whether the acoustic detection of wheeze is associated with impaired lung function. The present study aimed to investigate the relationship between wheeze detection and conventional parameters of lung function testing (LFT). Methods: Computerized lung sound analysis with quantification of wheezing (PulmoTrack®) was performed in 78 neonates at a median (IQR) postmenstrual age of 48 (44-59) weeks and a body weight of 4818 (3835–6140) g. In the same session, LFT was performed which included bodyplethysmography, tidal breathing measurements, SF6 multiple breath washout, measurement of respiratory mechanics by the occlusion test, forced expiratory flow (V'maxFRC) by rapid thoracoabdominal compression and capillary blood gas analysis. Results: Wheezing >5% of the breathing cycle was detected in 41/78 (53%) infants, 18/78 (23%) had inspiratory and 29/78 (37%) expiratory wheezing. Infants with and without wheezing did not significantly differ in postmenstrual age and body weight. Inspiratory wheezing had no relationship with LFT parameters. In contrast, infants with expiratory wheezing had significant changes in their breathing pattern and respiratory mechanics with increased tPTEF/TE (p=0.034), end-expiratory flow (TEF10, p=0.027), airway resistance (p=0.005) and respiratory resistance (p=0.036). Conclusion: Computerized wheeze detection is easy to perform in unsedated infants during natural sleep and may help to identify infants at risk of obstructive airway disease.