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Respiratory problems and use of impulse oscillometry in children 3 years to 6 years old

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Introduction: Measurement of lung function is an important component in the decision making process of obstructive airway diseases. It helps in arriving at a specific diagnosis, choosing pharmacotherapy and assessing prognosis. It can also help in assessing response to therapy.

Recent studies have brought into question the WHO guidelines regarding treatment of pneumonia which may result in over diagnosis of pneumonia and an over prescription of antibiotics at the expense of asthma and wheezing.

Objectives: Use of Impulse oscillometry to differentiate between pneumonia and wheezing in 3-6 years old children.

3-6 years old children with history of wheezing, fast breathing, breathlessness fulfilling inclusion criteria and whose parents give consent for study were included.

- History of patient regarding fever, cough, and fast breathing wheezing episode was taken. Past history of similar episode. History of atopy in child and parents was asked. (Regarding atopic dermatitis in child and atopic dermatitis, allergic rhinitis and bronchial asthma in parents).
- Thorough clinical examination of respiratory system was done. Appropriate investigations were done. Pulse oximetry was carried out.
- Impulse oscillometry was done on day 1, before and after nebulization with a bronchodilator. If the consent was given by the parent's skin prick test and serum IgE were done in atopic cases for confirmation.

Results: 51 children fulfill the inclusion criteria. 5 children did not perform the procedure optimally. Hence 46 patients were analysed.23 boys and 23 girls were present. Cold as a symptom was useful in differentiation. P value< 0.05. Cough as a symptom was not useful for differentiation. P value=0.915. Fever as a symptom affects final diagnosis P value<0.005. Breathlessness as a symptom cannot differentiate between the wheezing episode and bronchopneumonia P value >0.05. Heart rate was found to be insignificant. Respiratory rate was found to be significant P value<0.05. The resonant frequency before and after nebulization was found to be significant. The p value was <0.1

- The change in R 5 before and after nebulization: Paired T test was used to test change in R at 5 Hz. P value : 0.001678.
- Conclusion: Significant change in average of R at 5 Hz pre and post use of bronchodilator.

- Paired T test was used to test change in R at 20 Hz.
- Conclusion: No significant change in average of R at 20 Hz pre and post intervention

Conclusion: With proper history and clinical examination and use of impulse oscillometry it is possible to differentiate between wheezing episode and bronchopneumonia. It was found that symptoms fever and cold affects the final diagnosis but age, sex, cough and breathlessness does not affect the final diagnosis. In signs respiratory rate measured by the clinician significantly affects the final diagnosis but heart rate does not affect the final diagnosis. The difference between parameters checked by impulse oscillometry R at 5 Hz, AX and resonant frequency before and after nebulization was able to differentiate between bronchopneumonia and wheezing episode. It helps to objectively show the response to bronchodilator which gives an indication which child requires treatment with only bronchodilator and which child requires antibiotics. This approach can save lot of unnecessary treatment and admissions.

Biography

Suhas Kulkarni is working as an Associate Professor in the Department of Pediatrics at D Y Patil Medical College, Kolhapur, India. He is done various publications and detailed projects which are related to the field of Pediatrics.