



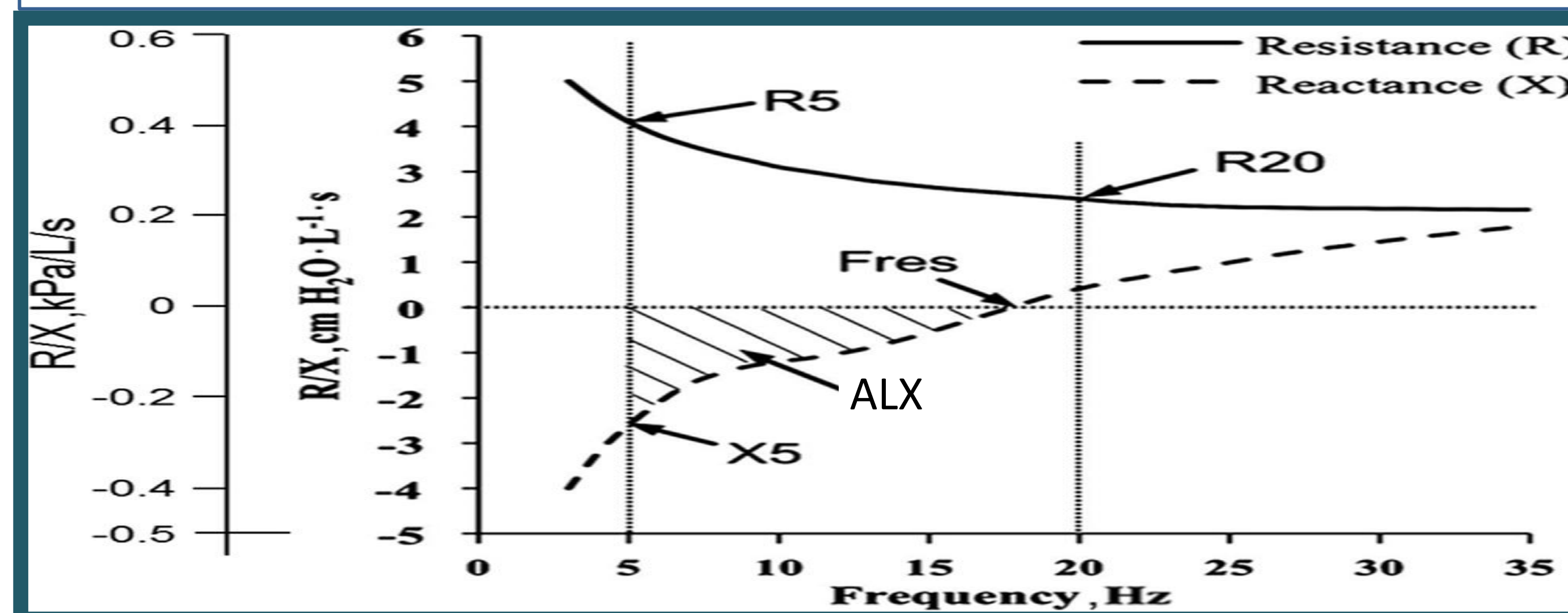
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Introduction

Rationale: Wheezing is a common problem in preschool children. The forced oscillation technique (FOT) has the potential role to facilitate asthma diagnosis in preschool children.

Materials and Methods

Children aged 2-5 years with recurrent wheezing were enrolled. Subjects were evaluated for skin prick test (SPT) to aeroallergens, fraction exhaled nitric oxide (FeNO), pediatric asthma control test (PACT), and FOT. FOT parameters, including resistance (Rrs), reactance (Xrs), frequency of resonance (Fres) and area of reactance (ALX), were recorded.



Results

The bronchodilator responsiveness (BDR) of resistance (Rrs), area of reactance (ALX), and frequency of resonance (Fres) were found to be significantly different among 4 groups ($p < 0.01$) with higher BDR value in asthmatic children compared to that of others

Demographic Characteristics of Study Subjects

Variables	Asthma (n=15)	atopic wheezing (n=16)	non-atopic wheezing (n=31)	healthy control (n=31)	P value
Age: month (IQR)	55 (47, 60)	57.5 (46.5, 63.5)	51 (40, 63)	51 (46, 64)	0.641
Male(%)	10 (66.7)	6 (37.5)	16 (51.6)	7 (22.6)	0.020*
BMI (Kg/m ²) (IQR)	15.8 (14.5, 16.8)	14.71 (14.1, 16.8)	15.2 (14.2, 17.9)	15.1 (14.2, 16)	0.196
Allergic comorbidity					
AR(%)	13 (86.7)	12 (75)	0	0	<0.001*
AD(%)	3 (20)	1 (6.3)	0	0	0.008*
Cesarean section (%)	7 (46.7)	11 (68.8)	14 (45.2)	12 (38.7)	0.269
Maternal history of allergic disease(%)	5(33.3)	7(43.8)	10 (32.3)	3(9.7)	0.005*
Fraction exhaled Nitric oxide(IQR)	20.9 (9.5,34.2)	10.43(4.5,23.4)	20(12.1,24)	13(6,22)	0.069

Symptoms	Asthma (n=15)	atopic wheezing (n=16)	non-atopic wheezing (n=31)	healthy control (n=31)	P value
Number of wheezing(IQR)	3 (2, 4)	3 (2, 4)	3 (2, 3)	0	<0.001*
Wheeze a part form cold (%)	14 (93.3)	13 (81.3)	7 (22.6)	0	<0.001*
Cough during playing or laughing(%)	14 (93.3)	2 (12.5)	1 (3.2)	0	<0.001*
Pediatric asthma control test score(IQR)	18 (12, 20)	22 (20, 24)	24 (23, 27)	27 (27, 27)	<0.001*

FOT parameter between Study Subjects

FOT parameter	Asthma (n=15)	atopic wheezing (n=16)	non-atopic wheezing (n=31)	healthy control (n=31).	P value
% BDR R5 (IQR)	30.4 (23, 39.8)	12.75 (2.95, 20.9)	22.9 (12.9, 31.2)	14.7 (4, 23)	<0.001*
% BDR R20 (IQR)	20.6 (11.3, 26.2)	10.9 (1.6, 21.65)	15.9 (9.1, 25.1)	10.3 (1.9, 23)	0.105
%BDR R5-20 (IQR)	55.2 (45.2, 71.5)	13.75 (-2, 26.25)	42.5 (21.2, 54.7)	30.2 (8.6, 41.3)	<0.001*
%BDR Fres (IQR)	42.1 (30.1, 52.6)	20.1 (-13.15, 25.1)	20.85 (11.8, 29.9)	26.4 (10, 37)	0.012*
%BDR ALX (IQR)	68.6 (54.1, 86.3)	32.7(-47.3, 55.8)	46.1 (19.5, 62.3)	44.9 (25.6, 64.4)	0.020*

Demonstration of lung function measurements using FOT



Conclusions

- Preschool asthmatic children have a greater %BDR for R5, Fres and ALX.
- Percent change in BDR R5-R20 could differentiate the diagnosis of asthma, atopic wheezing, or non-atopic wheezing.
- FOT measurement maybe a useful tool for asthma diagnosis in preschool children.