European Respiratory Society
Annual Congress 2012

Abstract Number: 537

Publication Number: 3299

Abstract Group: 7.1. Paediatric Respiratory Physiology

Keyword 1: Lung function testing **Keyword 2:** Spirometry **Keyword 3:** Children

Title: Association of sitting/standing height ratio and FEV_1 in multi-ethnic school children: The Size and Lung Function in Children (SLIC) study

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Body: Appropriate paediatric lung function reference equations for ethnic minorities are lacking. We investigated the extent to which differences in body proportions as indicated by the sitting/standing height ratio(Sit/Stand Ht) explain ethnic differences in FEV_1. Methods: As part of the SLIC study (commenced 2011), standard anthropometry including sitting height and spirometry were assessed in multi-ethnic London school children. FEV_1 was expressed in Z scores to adjust for sex, age and height (Stanojevic2009). Statistical analysis was by univariable and multivariable regression. Results: 379 healthy children (age: 5-10y, 43% boys; 31% White, 44% Black; 13% Asian, 12% mixed/other) performed successful spirometry. Compared with Whites, FEV_1 was significantly lower in Black, Asian & “Other” children. On univariable analysis ethnicity accounted for 28% and Sit/Stand Ht for 25% $zFEV_1$ variation. In a multivariable model the combined contribution was 35% with ethnicity contribution falling to 10%(Table).

Table: Linear regression showing ethnic differences in FEV_1 before & after adjustment for sit/stand height

	$zFEV_1$	$zFEV_1$
	Before adjustment	After adjustment
Adjusted R^2	0.283	0.352
Black	-1.2 (-1.4; -1.0)	-0.8 (-1.0; -0.6)
Asian	-0.9 (-1.2; -0.6)	-0.6 (-0.9; -0.3)
Other	-0.5 (-0.7; -0.2)	-0.3 (-0.6; -0.1)

Conclusion: This study shows that Sit/Stand Ht accounts for some of the differences amongst ethnicities in FEV_1 and provides further evidence that sitting height should be an essential part of standard anthropometry. Further work to explore the extent to which differences in body shape, size and composition contribute to ethnic differences in lung function is in progress.