



Asthma phenotype and ethnic differences in prevalence and health-service use

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Introduction

A recent review reported that prevalences of wheeze and diagnosed asthma were **lower** in south Asian than in white children in the UK, but medical consultations and hospital admissions were more common (Netuveli, Lancet 2005;265:312-7). Most of the cited studies used crude measures of ethnicity and did not take into account different exposures to risk factors.

This lower observed prevalence in south Asian children **contrasts with** the hypothesis that recent migrants from tropical to temperate environments might be at **higher** risk of atopic asthma (LeSouef, Lancet 2000;356:242-4).

Aims

In a large population-based cohort study, we wanted to **compare preschool children of white and south Asian ethnic origin with respect to:**

A) prevalence of wheeze according to phenotype (viral and multiple wheeze) and age,

B) utilisation of health care.

Methods – Leicestershire cohort

A postal questionnaire was sent to the parents of 6100 Caucasian and 2600 south Asian children aged 1 to 4 years, randomly sampled in 1998 from the population of Leicestershire, UK.

Information on ethnicity was derived both from the Health Authority Child Health Database and parental questionnaires.

Children with parent-reported current wheeze were divided into two phenotypes, those with exclusive viral wheeze and those with multiple trigger wheeze.

We collected information on a broad range of environmental and social risk factors for wheeze.

Response rates were 84% and 72% in white and south Asian children respectively.

Results were analysed using multiple logistic regression.

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A) Prevalence of wheeze according to phenotype and age in south Asian and white children

	White children (n=4366)		South Asian children (n=1714)		p	Comparison between prevalence in south Asian and white children		
	n	%	n	%		OR [†]	(95% CI)	p
1 to 1.99 year olds								
Viral* wheeze	689	23.4	142	18.0	<0.001	0.8	(0.6-1.0)	0.080
Multiple [†] wheeze	360	12.2	59	7.5	<0.001	0.7	(0.5-0.9)	0.015
2 to 4.99 year olds								
Viral* wheeze	166	11.7	108	11.7	0.900	1.4	(0.8-2.7)	0.257
Multiple [†] wheeze	144	10.2	86	9.3	0.510	2.2	(1.2-4.1)	0.012

* Viral wheeze is defined as wheeze triggered exclusively by viral infections.

[†] Multiple wheeze is defined as wheeze triggered by viral infections and other triggers.

[‡] Odds ratios comparing south Asian to white children; adjusted for neighbourhood deprivation (Townsend score), single parenthood, paternal education, maternal smoking, older siblings, breastfeeding, parental wheeze/asthma, parental hayfever, parental eczema.

B) Healthcare utilisation in south Asian and white children

	Age 1 to 1.99 years (n=3714)			Age 2 to 4.99 years (n=2346)		
	OR*	(95% CI)	p	OR*	(95% CI)	p
GP visits for wheeze or cough (never, 2 to 3, ≥ 4 times) [†]	2.3	(1.9-2.6)	<0.001	2.9	(2.5-3.5)	<0.001
Hospitalisation for wheeze or asthma	1.1	(0.7-1.5)	0.825	1.6	(1.1-2.4)	0.011
Treatment with inhaled corticosteroids	0.5	(0.3-0.8)	0.003	0.6	(0.5-0.9)	0.014

* Each outcome is reported as odds ratio comparing south Asian to white children; adjusted for severity of wheeze (activity restriction, shortness of breath when wheezing)

[†] Ordered logistic regression

Conclusion

In comparison with their white peers south Asian toddlers aged 2-4 years were:

- **more likely to suffer from multiple wheeze** after adjustment for differences in environmental exposures,
- **more likely to report GP consultations and hospital admissions** for wheeze and
- **less likely to use inhaled corticosteroids.**

Together, these data

1. support the hypothesis, that **children of tropical (south Asian) origin might be more prone to develop multiple wheeze** (a condition with many features in common with chronic atopic asthma) than white children with similar environmental exposures,
2. suggest that some of the **reported excess healthcare utilisation by south Asian children might be explained by differences in wheeze phenotypes and relative undertreatment with inhaled steroids.**