

Original Articles

Adult Asian acute asthma admissions reassessed: Blackburn 1991–1992

L. P. ORMEROD

Chest Clinic, Blackburn Royal Infirmary, Blackburn, U.K.

Two hundred and fifty-five admissions for acute asthma with a minimum 25% PEFR improvement in patients aged 15–44 years were studied in 1991–1992. Two hundred of these patients were in the white ethnic group (84 male; 116 female) with 33 (17.4%) being readmissions (15 male; 18 female). Fifty-five admissions (19 male; 36 female) were in the Indian subcontinent (ISC) ethnic group with 3 (5.5%; all female) readmissions. The readmission rate was significantly higher in the white ethnic group ($\chi^2=4.83$; $0.05 < P < 0.01$). Admission rates per thousand population in 5-yr cohorts were calculated from the 1991 Census data. The admission rate was higher in the ISC ethnic group in all cohorts except females aged 15–19 years, and was significantly higher in males aged 15–19 years and 40–44 years, and in all four cohorts between 25–44 years in females. Initial PEFR and % initial PEFR/highest PEFR did not suggest increased severity of asthma in the ISC ethnic group.

Introduction

A previous study (1) from the Chest Clinic, Blackburn, U.K. showed increased asthma admission rates in Asian patients aged 1–44 years in 1987, and that this could not be explained by increased re-admission rates. That study (1) could be criticized on two counts: firstly, the population data from which admission rates were calculated were estimates updating the 1981 Census (2); and secondly, the admissions were merely counted and had no 'quality control' to confirm that they were true asthma admissions. The 1991 Census, which included sufficient questions to get much more accurate data on ethnic minority groups, provides up-to-date population data from which to calculate admission rates. A prospective analysis of Asian and white acute asthma admissions was therefore carried out during 1991–1992.

Methods

Admissions with asthma as the primary diagnosis in the years 1991–1992, in persons aged 15–44 years on the date of admission were analysed for the Blackburn, Hyndburn and Ribble Valley District

Health Authority, U.K. The ethnic group of the admission was determined by name (3). The notes were examined and the lowest and highest peak flows were recorded for that admission. Arbitrarily, it was decided that admission was due to acute asthma if there was a 25% or greater difference between the lowest and highest peak-flow values, and conversely the admission was not counted if there was less than a 25% improvement. The numbers of admissions $1000^{-1} \text{ yr}^{-1}$ was calculated for 5-yr cohorts between the ages 15–44 years using the 1991 Census population data. Statistical analysis was by chi-squared (χ^2) test, by confidence intervals for relative risks (4), or by *t*-test of the mean, as appropriate.

Results

Two hundred and fifty-five admissions fulfilling the criteria in 1991–1992 were analysed. Nine admissions, all in white patients, were excluded as showing less than 25% PEFR improvement. Two hundred qualifying admissions were in the white ethnic group (84 male; 116 female) with 33 patients (17.4%) being readmissions (15 male; 18 female). Fifty-five admissions (19 male; 36 female) were in the Indian subcontinent ethnic group, with three patients (5.5%) being readmissions (all female). The readmission rate was significantly higher in the white

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Table 1 Population data and admissions

Age (years)	White ethnic group				ISC ethnic group			
	Male		Female		Male		Female	
	No.	Admit	No.	Admit	No.	Admit	No.	Admit
15-19	8119	15	7843	25	1168	7	1231	3
20-24	8659	13	8862	15	945	3	1096	4
25-29	8999	13	9146	13	720	2	829	8
30-34	8195	8	8360	12	860	1	955	4
35-39	7731	14	7754	21	931	3	881	12
40-44	9329	21	9091	30	528	3	516	5

Table 2 Admission rates $1000^{-1} \text{ yr}^{-1}$

Age (years)	Male		<i>R</i> value and* 95% confidence interval	Female		<i>R</i> value and* 95% confidence interval
	White	ISC		White	ISC	
15-19	0.92	3.00	3.25(1.32-7.96)	1.59	1.22	0.91(0.32-3.67)
20-24	0.75	1.59	3.15(0.86-11.45)	0.85	1.82	2.33(0.77-7.06)
25-29	0.72	1.39	2.08(0.47-9.21)	0.71	4.82	6.92(2.86-16.6)
30-34	0.49	0.58	1.19(0.14-9.49)	0.72	2.09	3.48(1.09-11.02)
35-39	0.91	1.61	2.26(0.64-8.08)	1.35	6.81	5.51(2.51-12.06)
40-44	1.12	2.84	3.80(1.15-13.05)	1.65	4.84	4.02(1.54-10.5)

*Odds ratio of ISC rate compared to white rate, 95% confidence interval with lower limit >1.0 is significant.

Table 3 Initial and highest PEFR and % initial/highest PEFR

Age (years)		Mean initial PEFR (l min^{-1})	Mean highest PEFR (l min^{-1})	% initial/highest PEFR
15-19	White ($n=42$)	204.3+83.3	441.9+71.4	46.1+17.4
	Asian ($n=10$)	176.5+80.3	398.0+71.5	45.2+20.4
20-24	White ($n=26$)	160.2+74.0	413.1+93.6	38.38+14.2
	Asian ($n=4$)	110.0+23.5	435.0+105.9	25.75+3.96
25-29	White ($n=20$)	161.5+60.9	451.0+78.9	35.9+12.9
	Asian ($n=12$)	120.8+48.9	383.3+74.5*	33.1+15.1
30-34	White ($n=26$)	175.4+84.4	427.7+112.1	41.1+15.2
	Asian ($n=8$)	117.5+40.8	323.8+73.6†	39.0+7.5
35-39	White ($n=36$)	156.3+64.8	427.2+102.6	38.8+17.6
	Asian ($n=12$)	110.8+42.5*	330.8+62.4‡	33.5+12.0
40-44	White ($n=49$)	131.3+52.5	336.8+97.9	40.3+13.9
	Asian ($n=9$)	128.9+19.1	308.9+98.4	44.7+10.9

* $0.05 > P > 0.02$; † $P = 0.02$; ‡ $0.01 > P > 0.001$, *t*-test of mean; results expressed as mean+SD.

ethnic groups ($\chi^2=4.83$; $0.05 < P < 0.01$). The population data and admissions are given in Table 1, total admission rates with odds ratios in Table 2 and comparison of initial and highest PEFR in Table 3.

The admission rate was higher in the ISC ethnic group in all age ranges in both sexes with the sole exception of females aged 15-19 years. The admission rates were significantly higher in males

aged 15–19 years and 40–44 years, and in all four 5-yr cohorts from 25–44 years in females. The severity of the asthma from initial PEFR was similar in both ethnic groups, except for age 35–39 years, where the ISC mean initial PEFR was lower. The degree of improvement as shown by % initial PEFR/highest PEFR was similar in the white and ISC ethnic groups.

Discussion

This analysis of adult acute asthma admissions over a 2-yr period, with only verified acute admissions included, confirms increased admission rates in ISC males and females compared to the white group, in all age ranges between 15–44 years, with the sole exception of females aged 15–19 years. As found in a previous report (1), this increased admission rate was not due to higher readmissions in the ISC group. In fact, the opposite was found with a significantly lower readmission rate.

The population data from which the rates were calculated were more reliable than those used in the previous study (1), as they were contemporaneous Census data (2) rather than estimates. The overall admission rate per thousand population in the white ethnic group aged 15–44 years in 1991–1992 was 0.97 compared with 1.10 in 1987 (1), and was 2.58 in the ISC group compared with 3.47 (1) in 1987. The figures for both ethnic groups, however, are still higher than those reported in Birmingham in 1981 (5) which were 0.79 in non-Asians and 1.98 in Asians, but a 60% rise in asthma admissions aged 15–44 years between 1978–1985 is reported (6).

The results shown could support either increased prevalence of asthma in the adult ISC ethnic group, or that asthma of sufficient severity to require hospital admission is more common in that group. There was, however, no consistent evidence that the severity of the asthma was different between the white and ISC ethnic groups. To date, there is conflicting evidence on asthma prevalence in Asians. Some studies published between 1975–1983 (7–9) gave higher prevalence rates for Asians than whites, but others (10–12) gave lower prevalence rates. The most recently reported studies from London (13) in 1986 and Southampton in 1989–1990 (14) gave similar prevalence figures for white and Asian school children. These prevalence studies, however, are mainly in children and some were performed on patients up

to 20 years ago. Consequently, these studies may not be applicable to the current 15–44 years groups in the Asian community. If the prevalence of asthma is similar in the white and Asian ethnic groups, then other cultural factors such as reluctance to accept a diagnosis of chronic disease, or reduced compliance with treatment particularly prophylaxis would have to be invoked to explain the higher Asian admission rate.

To determine which of these hypotheses explain the increased asthma admission rates in Asians will require further investigation, probably by prospective community studies.

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