reira and associates[15] demonstrated that indomethacin is a potent inhibitor of prostaglandin synthesis and suggested that this property might account for some of the drug's anti-inflammatory activity. This suggestion is supported by the observation that prostaglandins are involved in the inflammatory process.[16, 17]

[15] Ferreira, S. H., Moncada, S., and Vane, J. R.: Nature (New Biol.), 1971, *231*, 237.

[16] Greaves, M. W., Søndergaard, J., and McDonald-Gibson, W.: Brit. Med. J., 1971, *2*, 258.

[17] Crunkhorn, P., and Willis, A. L.: Brit. J. Pharmacol., 1971, *41*, 49.

PETER V. SACKS[18]
Scripps Clinic and Research Foundation
La Jolla, California 92037

DAVID KANAREK
Pulmonary Unit
Massachusetts General Hospital
Boston, Massachusetts 02114

[18] The writers thank Dr. H. M. Salmon, Superintendent of the Johannesburg General Hospital, for permission to undertake this study; Dr. P. Goosen of Merck, Sharp and Dohme (South Africa) for the supply of indomethacin and placebo suppositories; and Prof. T. H. Bothwell and Dr. S. Zwi for their helpful criticism of the manuscript.

DIFFERENCES IN VENTILATORY CAPACITY OF IRISH AND ITALIAN FIRE FIGHTERS[1]

Summary

In a study of respiratory disease in 1,768 Boston fire fighters, differences in pulmonary function were noted between men of Italian and Irish origin. Differences in smoking habits between the groups did not account for the differences. Body build and chest size might have contributed to the difference. This finding is of importance in epidemiologic studies involving pulmonary function.

In a cross-sectional, epidemiologic study of respiratory disease in 1,768 Boston fire fighters that was conducted to investigate the effects of occupational exposure, a difference in ventilatory capacity was noted between fire fighters of Irish and Italian national extraction. Variations in ventilatory capacity between racial groups have been reported. Europeans have been compared with Asian Indians, Chinese, Polynesians, and Negroes.[2-5] The height-corrected differences were in the order of 10 per cent, Europeans always having the larger capacity. Reports of intraracial differences, however, were not found in the literature.

Pulmonary function data were collected by methods described by Ferris and associates.[6] Predicted normal values for forced vital capacity (FVC) and forced expiratory volume in 1 second (FEV_1) were calculated from a regression equation using height and age. Since approximately two thirds of our population was Irish, the regression equation was based on data obtained from them.

Ratios of observed to predicted values were computed for each subject and expressed as a per cent. The mean ratio for the subgroups are presented in table 1. The ratios for fire fighters of Italian origin exceed those for the Irish by more than 4 per cent ($P < 0.01$ by t test of sample means). The capacity of Negroes was approximately 13 per cent of whites ($P < 0.01$); a finding compatible with Damon's.[5]

The significance of the difference in lung capacity between Irish and Italians was affirmed by

(Received in original form December 7, 1972 and in revised form February 16, 1973)

[1] This work was supported in part by Public Health Service Environmental Health Training Grant No. OH 00013, Center Grant No. ES 0002, and Grant No. R 01 OH 00369-01.

[2] Cotes, J. E., and Mahotra, M. S.: J. Physiol., 1964, *177*, 17P.

[3] Foster, J. H. and Hsich, P. L.: Arch. Intern. Med. (Chicago), 1923, *32*, 335.

[4] Glass, W. I.: New Zealand Med. J. 1962, *61*, 433.

[5] Damon, A.: Hum. Biol., 1966, *38*, 380.

[6] Ferris, B. G. Jr., and Stoudt, H. W.: Arch. Environ. Health (Chicago), 1971, *22*, 672.

TABLE 1

MEAN VALUES OF VENTILATORY CAPACITY OF 1,768 BOSTON FIRE FIGHTERS, BY ETHNIC GROUP

Ethnic Group	FVC, % of Pred* Mean	FVC, % of Pred* SE	FEV_1, % of Pred Mean	FEV_1, % of Pred SE	No.
Irish	99.9	0.38	99.9	0.43	1,158
Italian	104.5	0.99	104.4	1.06	210
Negro	87.9	2.94	86.8	3.74	17
Other	101.6	0.65	101.9	0.76	383

*Pred = predicted normal value.

TABLE 2

MULTIPLE REGRESSION EQUATIONS FOR VENTILATORY CAPACITY OF BOSTON FIRE FIGHTERS, BY NATIONAL EXTRACTION*

Regression Equation	Multiple Correlation Coefficient	SE
Irish		
FVC + −4.279 − (0.031 X age) + (0.058 X height)†	0.67	0.56
FEV_1 = −1.672 − (0.035 X age) + (0.039 X height)	0.66	0.51
Italian		
FVC = −4.952 − (0.021 X age) + (0.060 X height)	0.63	0.57
FEV_1 = −2.509 − (0.024 X age) + (0.41 X height)	0.64	0.47

*All variables entered in the equation made a contribution to the regression at $P < 0.05$.

†FVC and FEV_1 in liter; height in cm; age in years.

TABLE 3

CIGARETTE SMOKING CHARACTERISTICS OF IRISH AND ITALIAN FIRE FIGHTERS

Smoking Characteristics	Irish Mean	Irish SE	Italian Mean	Italian SE
Lifetime packs	7,564	197	6,018	456*
Years smoked	17.8	0.38	14.5	0.86*
Current cigarette consumption, cigarettes/day	12.2	0.12	7.0	0.25*

*Significant difference; $P < 0.01$.

calculating regression equations for ventilatory capacity based on age and height for each ethnic group (table 2). The age coefficients of the equations indicated that the Irish had annual decrement in FVC of 0.031 liter versus a 0.21-liter decrement for Italians, and a 0.035-liter decrement in FEV_1 versus 0.024 liter for the Italians. These differences were significant ($P < 0.01$). The regression equations also showed that the ventilatory capacity-height factor was the same for both ethnic groups.

Cigarette smoking might have explained the lower ventilatory capacity of the Irish. Table 3 shows that the Irish smoked more cigarettes for more years and had fewer ex-smokers and never-smokers than the Italians.

To evaluate the cigarette smoking factor, regression equations for the ventilatory capacity of the Irish were generated, including variables to account for cigarette smoking (table 4). Predicted FVC and FEV_1 for each fire fighter were calculated from these equations. The resulting predicted values are shown by ethnic group in table 5. Differences in ventilatory capacity be-

TABLE 4

MULTIPLE REGRESSION EQUATIONS FOR VENTILATORY CAPACITY OF IRISH FIRE FIGHTERS, ACCOUNTING FOR CIGARETTE SMOKING*

Equation
FVC = −4.154 − (0.032 X age) + (0.058 X height) − (0.038 X current consumption)†
Multiple correlation coefficient: 0.68; SE: 0.56
FEV_1 = −1.619 − (0.034 X age) + (0.039 X height) − (0.047 X current consumption)
Multiple correlation coefficient: 0.70; SE: 0.48

*See table 2 for units of variables.

†Current daily cigarette consumption: none coded as 1; 1–4 = 2; 5–14 = 3; 15–24 = 4; 25–34 = 5; 35–44 = 6; 45+ = 7.

TABLE 5

MEAN VALUES OF VENTILATORY CAPACITY CORRECTED FOR CIGARETTE SMOKING OF BOSTON FIRE FIGHTERS BY NATIONAL ORIGIN

Ethnic Group	No.	FVC, % of Pred*		FEV_1, % of Pred	
		Mean	SE	Mean	SE
Irish	1,158	100.0	0.38	99.3	0.41
Italian	210	104.1	0.97	102.4	0.97

*Pred = predicted normal value.

TABLE 6

PHYSICAL CHARACTERISTICS OF IRISH AND ITALIANS IN THE BOSTON FIRE DEPARTMENT

Physical Characteristics	Ethnic Groups			
	Irish		Italian	
	Mean	SE	Mean	SE
Age, years	43.8	0.91	44.0	0.73
Height, cm	174.2	0.60	169.8	0.40*
Weight, kg	81.7	0.31	80.9	0.76

*Significant difference; $P < 0.01$.

tween Irish and Italian fire fighters were slightly reduced, more for FEV_1 than FVC, but the differences were still significant ($P < 0.01$). Therefore, cigarette smoking accounted for only a small part of the total difference.

The differences in ventilatory capacity might have been due to an ethnic difference in stature or chest size; however, because no anthropometric measurements other than height and weight were made, this possibility cannot be fully evaluated. The mean height of the Italians was 4.4 cm less than that of the Irish, yet their mean weight was approximately the same (table 6). Height differences between the 2 groups increased with age, suggesting that any dissimilarity in stature between them disappeared in the younger groups. The factor for height in the regression equations was essentially the same for Irish and Italians.

* * *

Ferris and co-workers showed in 2 separate studies that standing height is a better predictor of ventilatory capacity than sitting height.[6] They noted, however, that this might not be true when "interethnic comparisons" are made. In this study, an interethnic difference was shown that cannot be explained by cigarette smoking habits. Dissimilarity in stature would possibly explain the difference.

REINHARD SIDOR
JOHN M. PETERS
Kresge Center for Environmental Health
Harvard School of Public Health
665 Huntington Avenue
Boston, Massachusetts 02115

[7] Ferris, B. G., Jr., and Anderson, D. O.: Amer. Rev. Resp. Dis., 1962, *86*, 165.