

dramatic response. We believe that this is the first report of successful treatment by captopril of a patient with intractable cardiac failure and profound hyponatraemia.

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Smoking among patients with malignant hypertension

Recent studies have shown that malignant hypertension is associated with excess smoking.¹⁻³ In North Karelia, Finland, we have conducted a hypertension control programme since 1972 covering most hypertensive patients in the county, who have high cardiovascular morbidity and mortality.⁴ We report on the association between malignant hypertension and smoking in these Finnish patients, who are unselected and representative of the North Karelian population.

Patients, methods, and results

During 1972-7 there were 17 014 registered hypertensive patients in North Karelia (9.6% of the total population). A functional diagnosis was given to each person on admission to the register based on the WHO protocol for the co-operative study. The categories were (1) stage 1 disease (high blood pressure only); (2) stage 2 disease (high blood pressure with cardiovascular hypertrophy); (3) stage 3 disease (high blood pressure with evidence of organ damage attributable to the hypertension); (4) under observation waiting for more detailed examination because functional diagnoses have not been given; and (5) malignant hypertension. The criteria for the diagnosis of malignant hypertension were the appearance of bilateral exudates, retinal oedema, haemorrhages, and vascular thrombosis, usually with the additional finding of bilateral papilloedema. Because of the difficulty in distinguishing renal damage due to essential hypertension from primary renal diseases, patients with possible renal disease were included. In the malignant phase, however, renal disease progressed rapidly.

The evaluation of severe hypertension was usually carried out at the Central Hospital of North Karelia. Most of the patients with malignant hypertension were known to be hypertensive on admission to the register. Fifty-six patients (24 men, 32 women) were registered as having malignant hypertension. Eight patients were under 45 years and 12 over 65. The ratio of men to women

among patients with malignant hypertension was close to that among all patients on the register.

The registration of hypertensive patients was based on standardised record forms covering most relevant information. The forms were filled in by local doctors in health centres and hospitals according to detailed instructions. Standardisation and improvement of diagnostic and therapeutic procedures was one main task in this community-based programme to decrease blood pressure among the whole population mainly by treating as many hypertensive patients as possible in the population and by keeping the greatest possible number of patients under control. Current smoking was reported as the average number of cigarettes smoked daily.

In a representative population sample in 1977, 44 out of 913 men aged 30 to 44 and 43 out of 1034 men aged 45 to 64 were smokers; and 13 out of 879 women aged 30 to 44 and six out of 1222 women aged 45 to 64 were smokers. In this study 13 of the 24 men (54%) and eight of the 32 women (25%) were smokers (table). In comparison, the prevalence of smoking among men with other functional diagnoses varied between 33% and 37%, and among women between 4% and 7%. The difference between malignant and non-malignant groups was nearly significant ($\chi^2(1) = 3.7$, $p < 0.10$) among men and significant ($\chi^2(1) = 22.4$, $p < 0.001$) among women and among both sexes combined ($\chi^2(1) = 17.2$, $p < 0.001$). In both sexes smoking among patients with malignant hypertension was more common in the youngest and oldest age groups than in the middle aged. Furthermore, among patients in the youngest age group (under 45) those with stage 3 hypertension tended to smoke significantly more ($\chi^2(1) = 6.0$, $p < 0.05$) than those with stage 1 or 2 disease, but not as much as those with malignant hypertension.

Comment

Our register of hypertension was based on the total population and, therefore, reflected the true position at the time the patients entered the register. No correlation was found between smoking and blood pressure. On the contrary, cigarette smoking among the patients, excluding those with malignant-phase hypertension, seemed to be lower than that among the general population, but differences were small. The prevalence of daily smoking among the general population aged 25 to 59 was 45% among men and 8% among women in 1972.⁴ Hypertensive patients on our register seem more likely to stop smoking than normotensive people. Stopping smoking should be encouraged early enough to prevent severe complications due to smoking, of which malignant hypertension is one: possible mechanisms have been discussed.^{1,2} There might also be another factor to which smokers are exposed—namely, cadmium—which causes tubular dysfunctions.⁵ Our register may provide a basis for further prospective study of long-term effects of smoking in a hypertensive population.

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Prevalence of smoking among hypertensive patients on admission to register by age, sex, and functional diagnosis. Figures are proportions of patients smoking (and percentages) in each group

	Men				Women			
	15-44	45-64	Over 65	Total	15-44	45-64	Over 65	Total
Under observation (stage IV)	20/61(33)	23/61(38)	5/21(24)	48/143(34)	1/25(4)	5/62(8)	0/24(0)	6/111(5)
Stage I	642/1562(41)	679/1884(36)	90/400(23)	1141/3846(37)	151/1083(14)	230/3585(6)	23/1189(2)	404/5857(7)
Stage II	80/194(41)	241/645(37)	53/288(18)	374/1127(33)	7/100(7)	70/1348(5)	19/997(2)	96/2445(4)
Stage III	45/76(59)	244/692(35)	70/334(21)	359/1102(33)	10/62(16)	38/925(4)	26/938(3)	74/1925(4)
Malignant hypertension	3/4(75)	8/17(47)	2/3(67)	13/24(54)	1/4(25)	3/19(16)	4/9(44)	8/32(25)