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Determinants of Compliance With an Early Detection Programme for Cancer of the Head and Neck in North-eastern Italy

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An early detection programme for cancer of the head and neck (H&N) has been conducted from January 1991 to January 1993 in Pordenone province, north-eastern Italy, an area with very high mortality rates for cancers in those sites. 627 high-risk individuals (491 males, median age 57 years and 136 females, median age 47 years) (i.e. smokers and/or drinkers of more than a half litre of wine or equivalent per day) were referred to a research nurse by 21 general practitioners. An educational message on the health hazards of tobacco and alcohol abuse was delivered together with an invitation to undergo a free ear, nose and throat (ENT) examination at a nearby hospital. 212 individuals (34%) underwent the ENT visit. The influence of various individuals' characteristics on the lack of compliance was assessed. Female sex and absence of ENT symptoms were associated with a more than two-fold higher lack of compliance. Current smokers were more than three-fold less likely to accept the invitation to undergo the examination. Conversely, alcohol intake and, within smokers, the amount smoked seemed unimportant. This study shows that the correct identification of high-risk individuals is expensive and the compliance with a H&N cancer early detection programme relatively low, especially among smokers.

Keywords: cancer of the head and neck, early diagnosis, screening, smoking, alcohol, general practitioners

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INTRODUCTION

TOBACCO SMOKING and alcohol drinking are strong risk factors for cancers of the head and neck (H&N) [1, 2]. Approximately 90% of cancers of the oral cavity, pharynx and larynx among males in northern Italy can be attributed to the combination of these risk factors [3, 4]. There is vast agreement that educational interventions against smoking and heavy drinking are priorities in order to reduce incidence rates from cancer of the H&N. There are, however, reasons to believe that early detection programmes can also contribute to reducing the number of deaths from these cancer sites, especially in some high prevalence areas and for high-risk individuals [5–8].

H&N tumours usually grow slowly and, in the majority of cases, involve sites that can readily be visualised and/or palpated during routine professional or even self-examination. However, late diagnosis of cancer of the H&N continues to occur [9] and contributes to the persisting poor prognosis of patients with cancer of the upper aerodigestive tract [10].

A barrier to a major contribution by screening and early detection programmes in the control of cancer of the H&N is represented by the tendency of these tumours to affect individuals who are, on account of advanced age, low socio-cultural level and lack of health awareness, those most unlikely to comply with screening.

A programme of early detection of H&N cancer, carried out in collaboration with several general practitioners (GPs) in an area of especially high mortality [11], offered the opportunity to quantify the relationship between various individuals' characteristics and consent to undergo an ear, nose and throat (ENT) professional examination.

SUBJECTS AND METHODS

Between January 1991 and January 1993, 21 GPs in the province of Pordenone (Friuli-Venezia Giulia region, north-eastern Italy) agreed to participate to the selection of high-risk individuals eligible for a programme of early detection of H&N cancer. Each of them hosted for 1 month, in his/her surgery unit, one of two research nurses to whom all patients above 35 years of age, who reported habitual smoking and intake of more than half a litre of wine or equivalent per day

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Table 1. Odds ratio (OR) and 95% confidence interval (CI) for non-compliance to H&N cancer early detection programme, according to sex, age and presence of symptoms. Pordenone, Italy, 1991–1993

Characteristic*	Compliance: Yes No. (%)		Compliance: No No. (%)		OR (95% CI)
Sex					
Males	185	(37.7)	306	(62.3)	1†
Females	27	(19.9)	109	(80.1)	2.4 (1.5–4.0)
Age (years)					
⩾65	58	(37.9)	95	(62.1)	1†
64–55	72	(45.9)	85	(54.1)	0.7 (0.5–1.2)
54–45	44	(30.8)	99	(69.2)	1.4 (0.8–2.3)
<45	38	(22.4)	132	(77.6)	2.1 (1.3–3.6)
χ^2_1 (trend)					14.04; $P<0.01$
Symptoms					
Present					
Dysphonia	7		5		
Cough	—	(53.8)	5	(46.2)	1†
Others	14		8		
Absent	191	(32.5)	397	(67.5)	2.4 (1.2–4.9)

H&N, head and neck. *Some figures do not add up to the total because of missing values. †Reference category.

(approximately 60 grams of ethanol per day), were referred. A detailed smoking and drinking history of each patient was elicited by the nurses and an educational message was delivered aiming to make the patient aware of:

- the wide range of diseases caused by any level of tobacco smoking, including H&N cancer,
- the health hazards of chronic levels of alcohol consumption which, however heavy, tend to be considered acceptable in the context of northeastern Italy, and
- the possibility of having access to an examination from two ENT professionals at a nearby hospital. The examination was free of charge and consisted of a routine oral and oropharyngeal examination, indirect laryngoscopy and optic fibre laryngoscopy.

A total of 627 subjects (491 males, median age 57 years, range 30–87; 136 feamles, median age 47 years, range 34–77) were thus contacted. The impact of various patients characteristics on the consent to undergo the ENT examination was assessed by means of odds ratios (OR) (i.e. the ratio of odds of non-compliance in the presence compared to the absence of the examined characteristic), as estimates of relative risks and their approximate 95% confidence interval (CI). To account for the potential mutual confounding effect of significant determinants of compliance, unconditional multiple logistic regression analysis was used [12].

RESULTS

Of 627 patients who were interviewed by research nurses and invited to have an ENT examination, 212 (33.8%) accepted and were examined. H&N cancer was found in 5 (2.4%) subjects (i.e. one cancer of the oral cavity, one of the pharynx, two of the larynx and one of the oesophagus, which was suspected because of saliva residues in the hypopharynx), whereas precancerous lesions were detected in 15 (7.1%) additional subjects (data not shown).

The influence of various individuals' characteristics on the probability of accepting the programme invitation is examined in Tables 1–3. Female, as compared to males, had a significant 2.4-fold higher odds of non-compliance (Table 1). Acceptance tended to be lower in younger age groups (OR of non-compliance in individuals below age 45 as compared to those aged 65 or above = 2.1) with a highly significant trend (Table 1). Also, the presence of some upper aerodigestive tract symptoms (6.2% of the overall group) exerted a significant influence on compliance with the programme, making attendance at the ENT examination 2.4-fold more frequent than in the absence of symptoms. It seemed, however, that dysphonia, but not cough, made patients more prone to undergo the examination offered by the programme.

With respect to major risk factors for H&N cancer, smokers, especially current smokers, seemed significantly more reluctant to attend the ENT examination (OR in current smokers vs. non-smokers = 3.4, 95% CI 1.8–6.3). Various aspects of smoking habits, including daily number of cigarettes and age at starting, did not seem to exert any specific effect on compliance (Table 2). Drinkers of alcoholic beverages, and especially former drinkers, were particularly likely to accept the invitation. However, drinking level, as well as smoking level, did not affect lack of compliance (Table 2).

Since some of the aforementioned characteristics were mutually correlated, they were jointly included in a multiple logistic regression model. The effects of age and drinking habits were, thus, attenuated while female sex, presence of symptoms and smoking were confirmed as factors associated with a significantly reduced compliance with an early detection programme (Table 3).

DISCUSSION

The present study on the determinants of individuals' consent to undergo an ENT examination offered by an early

Table 2. Odds ratio (OR) and 95% confidence interval (CI) for non-compliance to H&N cancer early detection programme, according to smoking and alcohol drinking habits. Pordenone, Italy, 1991–1993

Characteristics*	Compliance: Yes No. (%)	Compliance: No No. (%)	OR (95% CI)
Smoking habit			
Never smokers	29 (53.7)	25 (46.3)	1†
Ex-smokers	100 (40.0)	150 (60.0)	1.7 (0.9–3.3)
Current smokers	83 (25.7)	240 (74.3)	3.4 (1.8–6.3)
No. of cigarettes per day (current smokers only)			
≤15	35 (25.4)	103 (74.6)	3.4 (1.7–7.0)
>15	47 (25.5)	137 (74.5)	3.4 (1.7–6.7)
Age started smoking (years)			
≥19	70 (32.0)	149 (68.0)	2.5 (1.3–4.7)
<19	109 (31.4)	238 (68.6)	2.5 (1.4–4.7)
Years since quit smoking			
≥10	48 (44.9)	59 (55.1)	1.4 (0.7–2.9)
<10	52 (37.4)	87 (62.6)	1.9 (1.0–3.9)
Drinking habits			
Never drinkers	21 (22.3)	73 (77.7)	1†
Ex-drinkers	35 (44.9)	43 (55.1)	0.4 (0.2–0.7)
Current drinkers	156 (34.3)	299 (65.7)	0.6 (0.3–1.0)
Drinks per day (current drinkers only)			
<7	79 (31.9)	169 (68.1)	0.6 (0.3–1.1)
7–13	57 (39.6)	87 (60.4)	0.4 (0.2–0.8)
≥14	20 (32.3)	42 (67.7)	0.6 (0.3–1.3)

H&N, head and neck. *Some figures do not add up to the total because of missing values. †Reference category.

detection programme showed that female sex, lack of symptoms and current smoking habit are associated with a significantly lower compliance. The reluctance of smokers to comply with the programme, even in the presence of individual advice from their GP and research nurse, is especially worrying since the vast majority of cancer of the oral cavity, pharynx and larynx occurs in smokers. The number of cigarettes smoked per day, within current smokers, and drinking habits were not significant determinants of compliance.

H&N cancer screening is not among the population-based screening programmes supported by International Union Against Cancer (UICC) [13], but the United States Preventive Services Task Force and the U.S. National Cancer Institute guidelines recommend that "an examination for cancerous and precancerous lesions of the oral cavity be included in the periodic health examination of persons with exposure to tobacco and excessive amounts of alcohol", particularly in elderly patients [7]. With respect to cancer of the larynx, laryngoscopy, either rigid or flexible, is also proposed as a sufficiently acceptable and cheap screening test [8] and has already spread in some countries (e.g. Germany) [14].

H&N cancer screening or early diagnosis programmes differ, however, from other more widely applied programmes (e.g. those for cancer of the cervix and the breast) in the possibility of being restricted to a subsegment of the population: smokers and heavy drinkers. It is, therefore, of great importance to quantify the factors which affect the acceptance of high-risk individuals to undergo the tests offered within the programme.

This issue was addressed, in the present study, by means of a two-step approach carried out in collaboration with several GPs assisted by two research nurses. General practitioners were preferred to dentists since it is known that individuals at greatest risk for H&N cancer seek physician service substantially more often than dental service, on account of diseases associated with smoking, drinking or age [7].

The overall response rate was 34%, which can be considered rather low, although not too much at variance with that obtained in the domain, for instance, of cancer of the prostate [15]. It is worthwhile noting that this percentage is approximately half the one achieved in a previous similar H&N cancer early detection programme carried in 1988–1989 in the same area [6]. Reasons for this impairment in the response rate may result from the somewhat different design. In order to avoid the problem of GPs' lack of time and to improve the accuracy of the selection of high-risk individuals, two research nurses were employed in the present study and given the task to deliver to the patients the educational message and collect detailed smoking and drinking histories. Alternatively, it may be possible to speak about a "programme fatigue" since, although the general practices involved were different from

Table 3. Significant determinants of non-compliance to H&N cancer early detection programme. Pordenone, Italy, 1991–1993

Characteristics	OR (95% CI)*
Sex	
Males	1†
Females	2.2 (1.3–3.7)
Age (years)	
⩾65	1†
64–55	0.7 (0.4–1.0)
54–45	1.2 (0.7–1.9)
<45	1.5 (0.9–2.5)
χ^2_1 (trend)	3.56; $P=0.06$
Symptoms	
Present	1†
Absent	2.6 (1.3–5.2)
Smoking status	
Never smokers	1†
Ex-smokers	1.9 (1.0–3.5)
Current smokers	2.6 (1.4–4.9)
Drinking status	
Never drinkers	1†
Ex-drinkers	0.8 (0.4–1.7)
Current drinkers	1.0 (0.6–1.9)

H&N, head and neck.

*Estimates from logistic regression models including terms for all listed variable.

†Reference category.

those in the previous study, interest in the subject may have somewhat declined at a local level.

The assessment of the influence of individuals' characteristics on their acceptance of the ENT examination provides further reasons for concern. The low acceptance among females and younger individuals does not represent a severe problem, but the more than 3-fold lower response among current smokers, as compared to non-smokers, despite the advice of GPs and research nurses, is certainly a great obstacle to the implementation of H&N cancer screening on a large scale.

In conclusion, in areas where mortality rates from cancer of the oral cavity and pharynx (18/100 000 in males, standardised on the European population) and larynx (12/100 000) substantially exceed those recorded in Italy [11] and most European countries [16], early diagnosis programmes also meet with great difficulties. While the identification of high-risk individuals was expensive and required research nurses to work together with GPs, the response of targeted patients to the invitation to undergo an ENT examination was low and the most important risk factor for H&N cancer onset, smoking, was associated with a significantly lower compliance.

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