Cancer incidence among waitresses in Norway

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Previous studies have found high risk of cancers of the upper aerogastric tract, liver, and lung among waiters. Since approximately 75 percent of those working in the restaurant business in Norway are women, we have analyzed cancer incidence in a cohort of waitresses, to determine whether they have the same high cancer-risk as their male colleagues. The cohort consisted of 5,314 waitresses organized in the Restaurant Workers' Union between 1932 and 1978. The follow-up period was from 1959 to 1991. The standardized incidence ratio (SIR) for all causes of cancer was 1.0 (95 percent confidence interval [CI] = 0.9-1.1), based on 430 observed cases. Cancers of the tongue, mouth, pharynx, larynx, esophagus, and liver were grouped together as alcohol-associated cancers. SIR for these cancers combined was 1.1 (CI = 0.5-2.2). For lung cancer, SIR was 2.3 (CI = 1.6-3.1). Cervical cancer was also more frequent than expected, and breast cancer less frequent than expected. The larger excess of lung cancer and cervical cancer appeared in the sub-cohort working in restaurants with a license to serve alcohol. No excess risk of alcohol-associated cancers could be detected in this cohort of Norwegian waitresses. A longer follow-up period will be necessary to evaluate possible consequences of an increased alcohol consumption among younger waitresses. Waitresses in Norway are, like their male colleagues, at high risk for lung cancer.

Key words: Alcohol-associated cancers, cancer incidence, lung cancer, Norway, occupational cohort study, waitresses.

Introduction

Studies from several countries have shown an excess risk of cancer among male waiters.1-4 This increased risk has been caused mainly by elevated numbers of cancer cases at sites with an established relation to tobacco smoking and/or alcohol consumption: lung cancer and cancers of the upper aerogastric tract and liver.5,6 Most studies of occupational cancer incidence have concentrated on men; when women are included in occupational cohort studies, they are often too few in number to provide conclusive results. Comparatively little therefore is known about exposure patterns and cancer incidence in the female working population, especially in relation to specific occupations. It is known, however, that the consumption of alcohol varies among different occupations.7,8 In a survey of 104 occupations, Mandell et al9 found an elevated odds ratio for alcoholism among waitresses. Other studies have found increased risks of liver cirrhosis mortality, often used as an indicator of alcohol consumption, in this group.1,10 Survey studies also have shown that, for many occupations, employed women tend to smoke with a prevalence approaching that of males. In a 1970 survey in the United States, waitresses had the highest prevalence of current smokers (49.7 percent).11 Passive smoking also has been related to increased lung cancer risk,12,13 and this may be of importance in an occu-
pational group exposed to environmental tobacco smoke through most of the working day.

In Norway, women constitute approximately 75 percent of persons employed in the restaurant business. It is therefore the aim of this study to analyze the pattern of cancer incidence among waitresses with a special emphasis on cancer sites related to alcohol and tobacco consumption, in an attempt to determine whether cancer risk is equally high for waitresses as for their male colleagues.

Materials and methods

The cohort established for this study consisted of waitresses who joined the Hotel and Restaurant Workers' Union in 1932, when the union was established, and up to 1978. End of enrollment was chosen to allow sufficient latency for cancer to develop. Name, date of birth, and place of residence were recorded, in addition to date of joining, date of leaving and re-entering the union (when applicable), and the name and unique code of the workplace at the time of joining the union. Workplace codes were linked with the coding system of the employers' organizations, making it possible to categorize different types of restaurants/eating-places into places which did or did not serve alcohol.

In Oslo, members that died or left the union had successively been removed from the membership files. Due to this incompleteness, all Oslo members, estimated to be about one-third of all members, had to be excluded. After this exclusion, we received information on 5,586 waitresses, of whom 247 (4.4 percent) were lost to follow-up because of incomplete personal identification, and 25 (0.4 percent) because of lack of information on date of joining the union. This left 5,314 to be included in the study. The main reason for problems of identification seemed to be the custom of changing the surname upon marriage, since two out of three of the women who were lost to follow-up were young when they organized, and probably have married since joining the Restaurant Workers' Union. However, 74 percent of those lost were born in 1930 or later, and therefore would not have contributed much to the cancer experience of the cohort. Information on workplace was lacking for 63 of the waitresses, who therefore had to be excluded from the analysis of the sub-cohorts working in alcohol-serving and non-alcohol-serving places, respectively.

Thirty-six percent (1,906) of the waitresses were born before 1930. Through the whole inclusion period, 38.2 percent were under the age of 30 at the time of joining the union, 48.7 percent were between 30 and 49 years, and 13 percent were 50 years or older. Most of those who joined before the age of 30 were born in 1940 and after, while most of those who joined after the age of 49 were born before 1920. This age pattern for time of joining the union is partly a consequence of the fact that the union was not established until 1932. Therefore, a proportion of the women who joined before 1940 already had had many years of experience in the business. The pattern also reflects the fact that women have been joining the work force at a consistently younger age, also during the years of childbearing. Fifty percent (2,697) of the waitresses had been members of the union between 10 and 19 years, and 28.4 percent had been members for 20 years or more.

The Norwegian Cancer Registry was established in 1953, and receives information on all cancer cases in the country from histopathologic laboratories, hospital departments, and death certificates, and is considered to be virtually complete. The coding of cancer cases is based on the seventh edition of the International Classification of Diseases (ICD-7). The unique, 11-digit, personal identification number issued to all Norwegians alive in 1960 or born after that year ensured the linking of the waitress cohort and the Cancer Registry, adding the relevant information on cancer diagnosis; i.e., date of diagnosis, cancer site, and histologic diagnosis. Date and cause of death, and date of emigration were added through linkage with the Central Bureau of Statistics.

The follow-up period was from 1 January 1959 or, if the person joined the union after that date, from the middle of the year of joining. Each person was followed-up until 31 December 1991 or until the date of death or emigration. The analysis was based on a comparison of the observed number of new cancer cases occurring after joining the union, with the expected number. The expected number was calculated using the five-year age-specific incidence rates for each year for the female population in Norway outside Oslo. Standardized incidence ratio (SIR) and 95 percent confidence intervals (CI) were calculated assuming a Poisson distribution of cancer cases. A result was regarded as statistically significant if the CI did not include one.

This study focuses mainly on cancers etiologically related to alcohol consumption and tobacco smoking. Lung cancer is the most important of the tobacco-associated cancers. In the etiology of cancer of the mouth, tongue, pharynx, larynx, and esophagus, both alcohol and tobacco may act independently in increasing cancer risk, but when the two substances are combined, a synergistic effect is found, and cancer risk increases multiplicatively. Cancer of the liver is related causally to alcohol consumption, and a relationship to tobacco smoking has not yet been established. Since alcohol is the one common factor, cancers of the upper aerogastric tract and liver are