

Classifying Cancer of the Lip: an Epidemiological Perspective

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Abstract—A review of papers related to oral cancer reveals some non-uniformity in the classification of cancer of the lip. This paper examines the incidence of lip cancer in England and Wales using age-standardized and age- and sex-specific rates, and relates the results to those for other sites of oral cancer. There is a falling trend in age-adjusted incidence rates for lip cancer but not for intra-oral cancers, and the age-specific incidence shows a plateau effect for lip cancer after about 75 yr of age, whereas the incidence rate continues to rise throughout life for intra-oral cancers. These differences underline the importance of classifying cancer of the lip separately from other oral cancers.

INTRODUCTION

THE SURFACE of the lip is lined from behind forwards by mucosa, vermillion and skin, consisting of non-keratinising, transitional and keratinising squamous epithelium, respectively [1].

Cancer of the lip, almost always squamous in type, has been defined as a mucous membrane tumour arising on the vermillion surface or from the mucocutaneous junction of the lip [2]. Lip is the commonest site for cancer of the oral cavity [3, 4], and belongs to the group of orifice cancers which arise from those areas where the skin and mucous membrane meet. Orifice cancers behave in a much more malignant fashion than neighbouring skin epitheliomas and include a high proportion of basal cell carcinomas which only very rarely occur primarily on the vermillion surface [2-5]. Neoplasms arising from the skin of the lip should therefore properly be included under 'skin cancer' rather than 'lip cancer'.

Cancers of the vermillion surface are often not distinguished from those arising from the mucosal surface because the histological and clinical distinction is less apparent than that between vermillion and skin surfaces. Nevertheless, there appear to be very good reasons for

separating vermillion lip cancer from intra-oral cancer on the basis of sex ratio, rate of nodal metastatic disease and overall prognosis after treatment [5-7]. Vermillion tumours have in fact been variously documented separately as 'lip' or under the collective heading of 'mouth', 'oral cavity' or even 'buccopharyngeal cavity'.

Epidemiological reviews generally include lip cancer with intra-oral cancers, despite the differences already stated and the different exposure of the vermillion surface of the lip to likely carcinogenic stimuli such as sunlight and hot pipe stems [3-5, 7].

This paper compares time trends for lip cancer with those for intra-oral cancer in England and Wales, and adds further evidence in support of the separate consideration and classification of cancer of the vermillion surface of the lip.

MATERIALS AND METHODS

Materials

Registrations. Raw data were obtained from the collated incidence registration returns that have been submitted to regional cancer registries in England and Wales and published by the Registrar General for the years 1961-1977 inclusive [8, 9].

Population statistics. The population data have been taken from the census figures for England and Wales for the years 1961 and 1971 and from the sample census figures for 1966. For the intercensal years 1962-1977 inclusive, figures

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were drawn from the estimated total population for England and Wales, as published by the Government Statistical Service.

Rubrics. Tumours are classified into specific numbered sites (rubrics) which have changed over the past 20 yr as the International Classification of Diseases (ICD) system has been upgraded. From 1961 to 1964 lip and oral cavity were incorporated in 5 specific sites (see Table 1). In 1965 a number of additional sites within the mouth were specified and in 1968 tumour subgrouping became even more specific, as shown in Table 1.

It is likely that some tumours from the mucosal surface of the lip have been included under 'lip', especially in the period before 1965, when the rubrics were less specific.

Method

Age-adjusted incidence rate. This was derived from the registrations for each 10-yr age band (e.g. 35-44, 45-54, etc.) for each sex. The census population figures for England and Wales for 1971 were used for the standard population. All persons aged less than 25 yr were considered in one age band (0-24), as were those 85 yr and over (85+).

Table 1. Categories of newly registered cases of cancer, 1961-1977

Site	1961-1964	1965-1967	1968-1977
Lip	+	-	-
Upper lip	-	+	+
Lower lip	-	+	+
Both lips	-	-	+
Unspecified	-	+	+
Tongue	+	-	-
Base of tongue	-	+	+
Dorsal surface	-	-	+
Borders and tip	-	-	+
Ventral surface	-	-	+
Other, specified	-	+	+
Unspecified	-	+	+
Salivary gland	+	+	+
Gum	-	-	+
Floor of mouth	+	+	+
Other and unspecified			
Buccal mucosa	-	+	+
Roof of mouth	-	+	+
Other (specified)	-	+	-
Unspecified	+	+	+
Oropharynx	+	-	-
Tonsils	-	+	+
Faucial pillars	-	+	-
Vallecula	-	+	-
Other (specified)	-	-	+
Unspecified	-	+	+

Age- and sex-specific incidence rate. This was calculated for each 10-yr age band for each sex, for each year in the period 1961-1977.

Sex ratio. The m:f sex ratio was derived from the age-adjusted incidence rates for each sex for each year.

Graphic representation. Graphs have been drawn using a moving average adjustment so that the central of three consecutive values is represented on the graph by the mean of the three values. The first and last points on each graph are represented by the average of two values only.

Statistical method

The Spearman rank correlation test was used to assess any apparent trend in the various parameters [10].

RESULTS

Lip cancer

Age-adjusted incidence rate (AIR). The AIR for men and women for 1961-1977 (Fig. 1) shows a decline in rate for both sexes. The fall in rate for men is more apparent than the fall for women, and the overall trend is also more consistent in men (Spearman's rank test: $r_s = -0.94$; $t = 10.5$; d.f. = 15; $P < 0.0001$) than in women ($r_s = -0.67$; $t = 3.49$; d.f. = 15; $P < 0.01$).

Sex ratio. The m:f ratio for the AIR for lip cancer shows a slight but significant decline from 1961 to 1977 ($r_s = -0.53$; $t = 2.4$; d.f. = 15; $P < 0.05$).

Age- and sex-specific incidence rates (SIR). The SIR for men and women for each age-group are shown in Figs 2 and 3, showing a decline from 1961 for all age-groups, in both men and women. The age-specific registration rate generally rises with each successive age-group, although there was a tendency in the 1960s for the SIR to peak in the 75-84 age group and not rise further for the 85+ group.

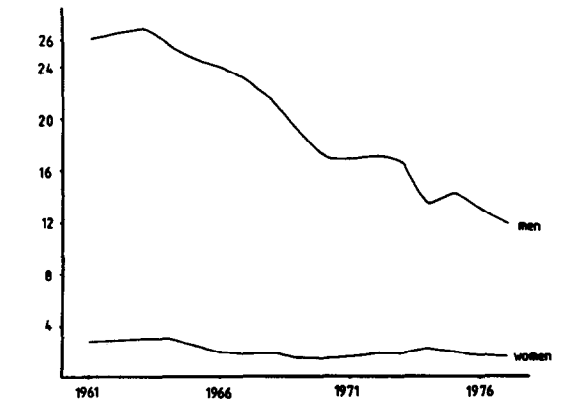


Fig. 1. Age-adjusted incidence (per million) of cancer of the lip for England and Wales, 1961-1977.

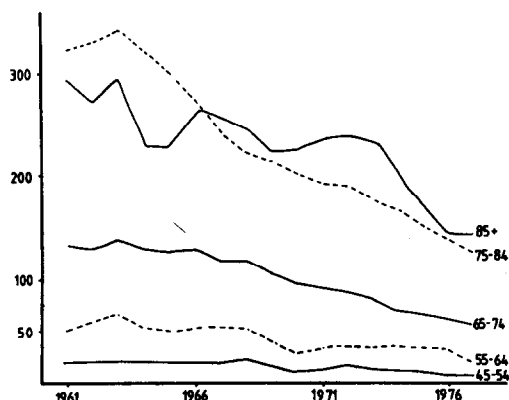


Fig. 2. Age- and sex-specific incidence (per million) of cancer of the lip for England and Wales in men.

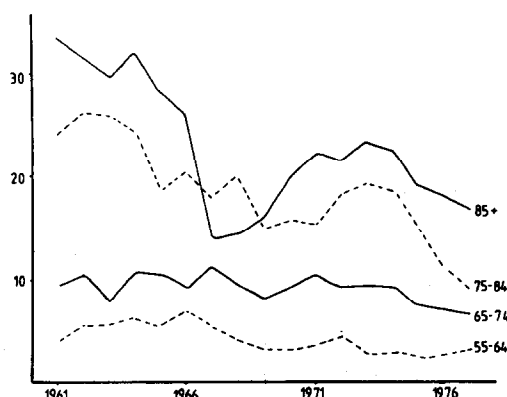


Fig. 3. Age- and sex-specific incidence (per million) of cancer of the lip for England and Wales in women.



Fig. 4. Age-adjusted incidence (per million) of all intra-oral cancers for England and Wales, 1961-1977.

Intra-oral cancer

Age-adjusted incidence rate. The AIR for intra-oral cancer is shown in Fig. 4. There is no apparent trend for either sex (r_s for men = 0.43; $t = 1.86$, $P > 0.05$; r_s for women = 0.28; $t = 1.14$, $P > 0.1$). Analysing the AIR for the separate sites within the mouth reveals a similar pattern for each site (Figs 5 and 6).

Sex ratio. The m:f sex ratio for intra-oral cancer has not appreciably altered over the review period,

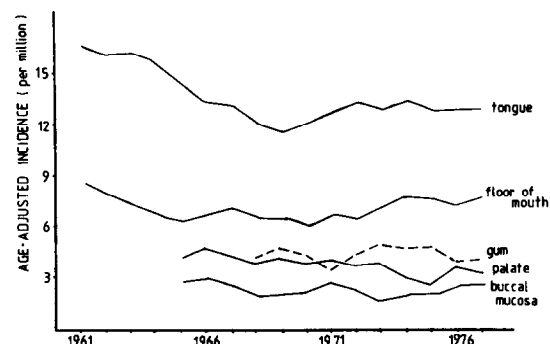


Fig. 5. Age-adjusted incidence (per million) for specific cancers of the oral cavity for men in England and Wales, 1961-1977.

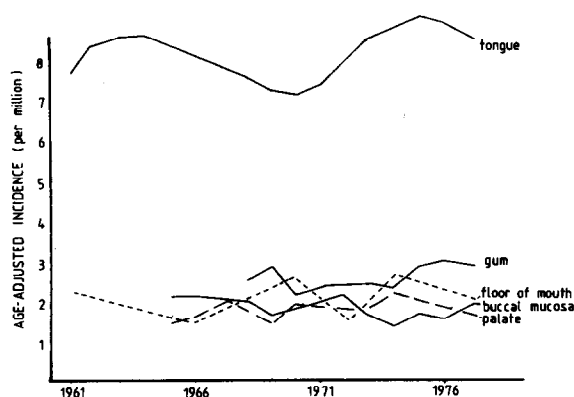


Fig. 6. Age-adjusted incidence (per million) for specific cancers of the oral cavity for women in England and Wales, 1961-1977.

but it is interesting to note that the mean m:f ratio is 1.9:1, which is markedly less than the individual ratio for lip cancer in any year. Furthermore, no intra-oral cancer has a male predominance as great as that for lip cancer (see Table 2).

Age- and sex-specific incidence rates. For intra-oral cancer there is a much more pronounced rise in the age-specific incidence rate in successive age-groups after 65 yr than is seen with lip cancer (Figs 7 and 8). The decline in each age-specific rate over the review period is not as pronounced for intra-oral cancer as it is for lip cancer (Figs 2 and 3).

Table 2. Mean m:f sex ratio for oral cancer (by site), 1961-1977

Site	M:F ratio (mean)
Lip	8.5
Intra-oral (overall)	1.95
Tongue	1.67
Buccal mucosa	1.26
Floor of mouth	3.55
Other	1.65



Fig. 7. Age- and sex-specific incidence (per million) of intra-oral cancer in men for England and Wales, 1961-1977.

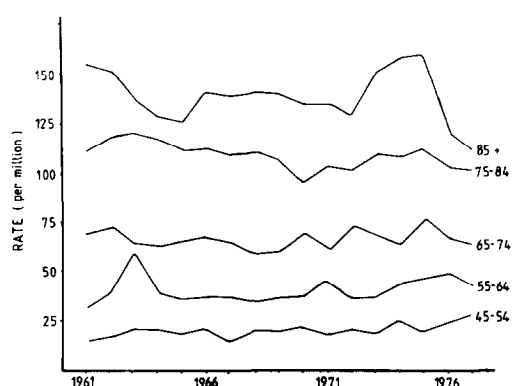


Fig. 8. Age- and sex-specific incidence (per million) of intra-oral cancer in women for England and Wales, 1961-1977.

DISCUSSION

The results for lip cancer show a falling trend in age-adjusted incidence rate and a plateau effect in the age-specific incidence rate after the age of 75 yr. Intra-oral cancer has no significant trend, and the incidence rate continues to rise markedly throughout life. The various sites within the mouth itself show no major differences in time-trends. These data support the contention that lip cancer is indeed a distinct pathological entity and should be considered separately from other oral cancers.

The epidemiological differences between lip and intra-oral cancers are subject to some error

because of the possible biases in the cancer registration data with respect to both completeness and accuracy [11]. The completeness of registration is improving with each year that passes [8, 11], but in view of the obvious nature of lip cancer compared with intra-oral cancer, it may be that a slight decreasing trend in intra-oral cancers has been masked by improved registrations, whereas there may have been comparatively little improvement in completeness of registration for lip cancer.

Cancer of the skin surface of the lip (consisting mainly of basal cell carcinomas) may have been included in the early registration figures for lip cancer, which would tend to increase the m:f ratio and improve the prognosis after treatment. Alternatively, the more malignant intra-oral cancers from the mucosal surface of the lip may have been incorporated in the vermillion cancers, in which case, with improved accuracy of registration, the epidemiological differences between lip and intra-oral cancers will become more pronounced.

Despite the possibilities of inaccurate and incomplete data, the epidemiological analysis serves to reinforce the clinical conviction that the category of cancer of the lip should be confined to cancer arising from the vermillion surface.

These national figures do not have the same bias that exists in data from specific hospitals or clinics, where the pattern of referral may obscure the true nature of the disease. An inspection of the contemporary medical literature on the subject of lip cancer indicates that there remains a great deal of ambiguity and non-uniformity in the use of the term 'cancer of the lip'. It seems therefore that we have progressed very little over the last 40 yr, for Ebenius wrote in 1943:

"No other cancer than that arising in the red of the lip should be regarded as genuine lip cancer and . . . the red of the lip corresponds clinically to the area between the cutaneous portion of the lips and their line of closure" [5].

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