Oral Oncology 50 (2014) 90–97

Contents lists available at ScienceDirect

Oral Oncology

journal homepage: www.elsevier.com/locate/oraloncology

Why are head and neck squamous cell carcinoma diagnosed so late? Influence of health care disparities and socio-economic factors

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ARTICLE INFO

Article history:
Received 7 August 2013
Received in revised form 7 October 2013
Accepted 12 October 2013
Available online 20 November 2013

Keywords:
Head and neck cancer
Socio-economic factors
Stage at diagnosis
Health care access

SUMMARY

Context: Late stage diagnosis of Head and Neck Squamous Cell Carcinoma (HNSCC) makes the prognosis worse. However, the influence of inequalities of health care and socio-economic factors has never been investigated in this pathology.
Objectives: To identify any inequalities in health care and socio-economic factors influencing late-stage diagnosis of HSNCC.
Design: The ASED study (Acces aux Soins avant Endoscopie Diagnostique) was a cross-sectional observational, multi-centric (19 centers) study on metropolitan French territory. Data was collected from 1st December 2010 to 30th June 2012.
Setting: Patients were included prospectively in Head and Neck Surgery departments. A self-administered form was completed by the patients at the time of ambulatory diagnostic endoscopy (38 items describing demographic, socio-economic and health care access characteristics). A second form was completed by the surgeon at the time of histological confirmation of HNSCC (11 items describing the tumor).
Patients: Six hundred and ninety patients aged 18 or more with a first HNSCC were included. Exclusion criteria were second HSNCC or loco-regional recurrence of HNSCC.
Main Outcome measure(s): Late-stage was defined as T3/T4 tumor, and early-stage was defined as T1/T2 tumor, according to the TNM classification.
Results: Independent factors associated with late-stage diagnosis were: hypopharyngeal location (OR = 3.5 [1.8–7.3] versus oral cavity location), age (OR = 1.02 [1.00–1.04]), male sex (OR = 1.7 [1.1–2.6]) and being born in France (OR = 2 [1.2–3.3]). Factors associated with early-stage diagnosis were previous consultation to a specialist physician (OR = 0.5 [0.4–0.8]), ease of access to this specialist (OR = 0.6 [0.4–0.9]), and having a health professional in close contact (OR = 0.6 [0.4–0.8]). Time to consultation was identical in both groups. No significant association was found between socio-economic factors (especially deprivation or alcohol and tobacco consumption) and late-stage diagnosis of HNSCC.
Conclusion: Health care access in France plays a major role in the stage of HNSCC at diagnosis. Easy access to a specialist protects from late-stage diagnosis. Absence of socio-economic factors may be due to the French social security system and its comprehensive coverage of the population.

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http://dx.doi.org/10.1016/j.oraloncology.2013.10.016

Introduction

Head and Neck Squamous Cell Carcinomas (HNSCCs) rank fourth in terms of incidence and fifth in terms of cancer mortality worldwide [1,2]. Their incidence in France is the highest in Europe and in the year 2000 this was estimated at around 20,000 new cases [2–4], 4000 being laryngeal, and 7500 being located in the oral cavity (including the soft palate and tonsils). Men are 3 times more prone to developing this type of cancer than women, but its incidence is decreasing in men, and increasing in women [5]. Tobacco consumption in women is also increasing [5–7]. Related mortality remains very high, with a 5-year survival rate of 50% for laryngeal cancers and 30% for oral cavity and pharyngeal cancers [3].

Patients with HNSCC come mainly from the lower socio-economic classes. Major risk factors for HNSCC are tobacco use and alcohol consumption [8,9], and in France deprived patients are more exposed to these substances [10]. More than half of HNSCCs are diagnosed at a late stage (stage III or IV of the international UICC-AJCC classification [11]). This situation is regrettable, as HNSCC prognosis is directly related to its stage at treatment, with early treatment being possible without major sequelae [10]. Late stage diagnosis can result from late diagnosis, from late presentation but also from early diagnosis of a late stage tumor [12]. It is necessary to quantify the role of these different mechanisms to planify public health actions.

In other areas of oncology, it has been found that low socio-economic status is often associated with late stage at diagnosis [13–16]. Variations in health care access may also explain differences in stage at diagnosis [1,17–23]. Quality of life after treatment and survival rate in HNSCC are directly related to stage at diagnosis [10,24]. If public awareness campaigns are to be developed, we need an accurate description of the HNSCC population, and the route by which it reaches specialized cancer centers [25].

The ASED (Accès aux Soins avant Endoscopie Diagnostique) study was thus established to evaluate patients' socio-economic characteristics and their access to healthcare. The aim of this work was to detect any healthcare inequalities and socio-economic factors which influence late-stage diagnosis of HSNCC (T3/T4 of TNM classification [26,27]) compared to early stage diagnosis (T1/T2). Our hypothesis is that deprived patients have an increased risk of late stage diagnosis, due to socio-economic difficulties or problems concerning access to the specialized care system.

Materials and methods

Data collection

This cross-sectional observational study included all patients aged 18 or more presenting with a first HNSCC in 19 head and neck (HN) surgical departments –either Oral/maxillofacial or Ear/Nose/Throat surgery departments- on metropolitan French territory between 1st December 2010 December and 30th June 2012. No restriction on TNM stage was applied. Exclusion criteria were recurrence or new location of HNSCC.

Data was collected on two pretested forms created by a multidisciplinary team including HN surgeons, an epidemiologist and a statistician (see appendix). Patients first filled in a 38-item form while awaiting panendoscopy in the day hospital; this gathered information about demographic criteria, addictions, socio-economic criteria and the patient's access to care before arriving in the investigating center. The patient's surgeon verified that the form was fully completed, and clarified points if necessary. The surgeon completed a second 11-item form as soon as pathological confirmation of HNSCC was received; this collected information on date and type of first symptoms, tumor biopsy date, its stage, aspect, and location according to panendoscopy ± CT scan or MRI findings.

The anonymized data (number of center and patient) was collected in every center and mailed by postal route to the coordinating unit. A copy of both forms was kept in each department. The database was created and managed with double input and corrections if necessary.

Indicators

The main outcome measure was the T stage of the TNM classification, with late-stage diagnosis defined as initial presentation with T3/T4 tumor, and early-stage diagnosis defined as T1/T2 tumor [28].

Tumors were classified into 4 locations: oral cavity, oropharynx, hypopharynx and larynx. Those involving $\geqslant 2$ areas were classified at the level with the worst prognosis (i.e., with a hypopharyngeal cancer being the worst, followed by oropharyngeal, oral cavity and laryngeal, in order of increasingly better prognosis) [10].

Demographic indicators were sex, age at diagnosis, body mass index (BMI, classified according to WHO criteria [29,30]), home region and investigating center region (classified as North, South, and Parisian from the established regional differences of HNSCC incidence rates [31,32]), and country of birth.

Information was gathered on tobacco smoking in pack-years (PY), marijuana smoking, and alcohol and hard drug consumption.

Socio-economic indicators collected were occupational class (8 classes coded from the National Institute of Statistics and Economic Studies, INSEE [33]), type of work contract (fixed-term, part-time, current sick leave), and educational level (high secondary level and beyond versus other). Deprivation was coded as a binary variable according to the EPICES score [34–36] ranging from 0 to 100 (deprived $\leqslant 30.17$ versus non-deprived > 30.17) (Table 1), as was monthly income ($\geqslant$1500 euros versus other, 1500 euros being the average monthly family income in France) and social protection (general social security system versus other or none). Deprivation according to EPICES score is an individual-level indicator. It takes into account various aspects of deprivation such as: life events, ressources, education, employment, living conditions, social support and perceived health. It is calculated on 11-yes or no weighted questions answered by patients. It was built by a french medical team [34]. 7208 patients from 18 Health Examination

Table 1
EPICES Score: detail of the 11 binary items.

	T1/T2 (n = 323) No. (%)	T3/T4 (n = 345) No. (%)	P value
Precarious (according to EPICES score)[a]	192 (70)	220 (74)	.40
Sport practicing	79 (25)	68 (20)	.12
Complementary health care insurance	239 (78)	240 (72)	.14
Family contact within 6 months	224 (70)	243 (72)	.60
Financial difficulties to face the needs	110 (36)	124 (37)	.70
Accommodation by close contacts of patient in case of need	209 (75)	219 (73)	.60
Material help by close contacts of patient in case of need	191 (69)	205 (69)	.95
Meeting with a social worker[b]	41 (16)	45 (17)	.70
Went to show within 12 months	112 (35)	91 (26)	**.02**
Went on holidays within 12 month	145 (45)	140 (41)	.20
Owner of his accommodation	167 (53)	158 (47)	.10
Lives alone	91 (30)	125 (37)	.08

Bold variables indicates a significance level <.05.
[a] 14% of missing values for at least 1 item.
[b] N = 520.