Cognitive experience of oral cancer among young people of "Sapienza" University of Rome

Livia Ottolenghi, DDS[1]
Umberto Romeo, DDS[1]
Francesco Carpenteri, DDS[1]
Sergio Fiorentini, Student[1]
Dimitri Boatta, Student[1]
Anna Rita Vestri, MD[2]
Ersilia Barbato, DDS[1]
Antonella Polimeni, MD[1]

Sapienza University of Rome, Italy
[1] Faculty of Medicine and Dentistry, Department of Odontostomatological and Maxillofacial Sciences
[2] Faculty of Pharmacy and Medicine, Department of Public Health and Infectious Diseases

Corresponding author:
Francesco Carpenteri, DDS
Faculty of Medicine and Dentistry, Department of Odontostomatological and Maxillofacial Sciences,
Sapienza University of Rome, italy
Largo Beltranelli, 36
00157 Rome, Italy
Phone: +39 06 89571787
Email: francescocarpenteri@gmail.com

Summary

Aims: the aim of this study was to analyse the awareness of oral cancer among young adults in the city of Rome. *Materials and methods*: during the orientation period for new graduates students, or "Porte aperte", organised by the Sapienza University of Rome in July 2009 and 2010, a survey among young people regarding their knowledge on the risk factors, the importance of early diagnosis, and the methods for primary and secondary prevention of oral cancer was conducted. A total of 1125 questionnaires were administered to subjects who agreed to respond to assess the level of knowledge of the disease.
Results: only 45.3% of the sample population was aware of the existence of oral cancer; among these individuals, 36.9% did not perceive seriousness of the malignancy. High school students who attended a scientific high school knew the risk factors better than the students who attended classical and technical high school.
Conclusions: rigorous educational programs along with diagnostic strategies promise to reduce the burden of oral cancer. The data obtained from this study highlight the need to increase health education, especially among young people in humanistic or technical high schools and universities (Classical High School, Technical Institutes, Faculty of Letters, Faculty of Law)

where there is a lack of knowledge concerning oral cancer prevention.

Keywords: oral cancer, prevention, late diagnosis.

Introduction

Oral cancer is one of the most common cancers worldwide and is highly invasive and debilitating. With approximately 6000 new cases per year in Italy, oral cancer represents a public health problem. Squamous cell carcinoma of the oral cavity represents about 2% of all malignant neoplasms and 47% of those developing in the head and neck area, with survival rates that are among the lowest of all major cancers. More deadly than breast cancer, cervical cancer and prostate cancer, oral cancer was estimated to kill one person every hour, every day (1,2). The tongue is the most common site involved, and this incidence is increasing mainly in young people, possibly related to human papilloma virus infections. Prognosis depends on the stage: the 5-year survival rate of tongue squamous cell carcinoma, whatever the T stage, is 73% in pN0 cases, 40% in patients with positive nodes without extracapsular spread (pN1 ECS–), and 29% when nodes are metastatic with extracapsular spread (pN1 ECS+: $p \geq 0.0001$) (3-6).

These statistics are dramatic, especially if we consider that the disease arises in the foreground on the oral mucosa, which is easily accessible to endoral objective examination. Thus, the lesions are ignored or not observed by patients or healthcare professionals. In part, the late diagnosis may result from an incomplete understanding or a lack of awareness that small asymptomatic lesions have a significant malignant potential.

Furthermore, a *delay in diagnosis* or monitoring of the disease in advanced stages may be caused by the patient or health personnel (7). Health education with programs designed to motivate patients to undergo periodic checks are the best way to promote prevention (8).

Dental health care providers play a key role in the *prevention* of oral cancer; these health workers, with the detection of neoplastic disease and the proper health education, contribute to the reduction of poor outcomes from this serious disease. Recent research conducted in a group of Italian cancer centres demonstrated that an average of 6 months elapses between the diagnosis of cancer and the start of an appropriate therapy, a period that irreversibly influences the therapeutic approach to this disease. It is reasonable that all patients who present symptoms of suspected neoplastic nature have access to a specialist visit no later than 2 weeks from the first contact with services and to have a definitive diagnosis no later

than one month *(objective set by the British National Health Service in relation to time considered desirable in cancer diagnos)* (9). Currently, *early diagnosis* is, for many neoplastic diseases, essential to achieve good therapeutic results, with a positive impact in terms of not only prolonged survival but also improved quality of life (10,11). An early cancer diagnosis made when the disease is not at an advanced stage allows the possibility to offer the patient surgical techniques that are less invasive and destructive.

Thus, early diagnosis represents an important chapter of cancer care that must be solved by services through two different points of view:

- the view of a single patient who presents as a "suspect case" with the target of rapid diagnosis, obtained through a careful clinical examination by operators able to identify the symptoms that qualify the patient as the bearer of a possible tumour;
- the view of the whole population whose goal is early diagnosis when the disease has not yet clinically manifested itself by offering participation in screening programs.

This project, was set-up as a campaign to raise awareness of such a disease that, despite being serious, is only little known to the general public.

Materials and methods

In the orientation period for high school graduates students, organised by the Sapienza University of Rome in July 2009 and 2010, a survey among young people was conducted. The survey concerned the knowledge of risk factors, importance of early diagnosis, and the methods of primary and secondary prevention of oral cancer (12). During the three days of the "*Porte aperte alla Sapienza*", a team of students enrolled to the degree course of Dentistry has been working at the stand dedicated to the

Faculty of Medicine and Odontology. This group administered 1125 questionnaires to subjects who agreed to participate (661 subjects in 2009 and 464 subjects in 2010) to assess the knowledge of oral disease within this population. Data were collected regarding the type of work or study activities, the age of population, the presence of doctors in the family context and the possibility to made preventive specialist check-ups (Tabs.1-4).

Afterwards informational brochures (13) were distributed to the students illustrating the incidence of various risk factors, the general characteristics of the disease, the signs and symptoms and what to do when they are present. Our work has focused on risk factors that the international scientific literature indicates as being the most involved in the aetiopathogenesis of oral cancer, i.e., smoking, alcohol and sunlight (14-23).

Statistical analysis

The data are reported using frequency counts and percentages. To evaluate the possible associations between variables the chi-squared test or the Fisher's exact test were used, where appropriate. Tests are adjusted for all pairwise comparisons within a row of each innermost subtable using the Bonferroni correction. The statistical significance was set at 5%, and the analysis was conducted with SPSS v13.

Results

A total of 1125 questionnaires were completed, which could be divided into the following populations: 248 workers (22.1%), 402 High School students (35.7%), and 475 University students (42.2%).

The High School students were further subdivided into the following groups: 130 from Classical High School (11.6%),

Category	Frequency	Percentage
High School students	**402**	**35.7**
Classical High School	130	11.6
Scientific High School	167	14.8
Technical High School	105	9.3
University students	**475**	**42.2**
Law	122	10.8
Letters and Philosophy	118	10.5
Medicine and Surgery	112	10.0
SMFN*	123	10.9
Other	**248**	**22.1**
Total	**1125**	**100**

*Faculty of Mathematical, Physical and Natural Sciences

Table 1. Sample composition.

Type Activities	Mean	N	SD	Median	Minimum	Maximum
Workers	37.35	248	7.786	37.00	24	61
High School students	18.75	402	1.097	19.00	16	25
University students	21.79	475	2.462	21.00	18	29
Total	**24.13**	**1125**	**8.219**	**21.00**	**16**	**61**

Table 2. Sample age.

Question		Frequency	Percentage
1. Have you ever heard about the oral cancer?	No	615	54.7
	Yes	510	45.3
	Tot.	**1125**	**100.0**
2. Oral cancer is a benign or malignant tumour?	Malignant	493	43.8
	Benign	83	7.4
	Do not know	549	48.8
	Tot.	**1125**	**100.0**
3. Smoking may increase the risk of developing oral cancer?	No	24	2.1
	Yes	903	80.3
	Do not know	198	17.6
	Tot.	**1125**	**100.0**
4. Alcohol may increase the risk of developing oral cancer?	No	194	17.2
	Yes	474	42.2
	Do not know	457	40.6
	Tot.	**1125**	**100.0**
5. A long exposure to sunlight may contribute to the onset of oral cancer?	No	317	28.2
	Yes	230	20.4
	Do not know	578	51.4
	Tot.	**1125**	**100.0**
6. Early diagnosis of oral cancer may help?	No	8	0.7
	Yes	893	79.4
	Do not know	224	19.9
	Tot.	**1125**	**100.0**
7. Do you know that you can make a visit for prevention of oral cancer?	No	638	56.7
	Yes	487	43.3
	Tot.	**1125**	**100.0**
8. Have you ever made a dentist's visit for prevention of oral cancer?	No	1093	97.2
	Yes	32	2.8
	Tot.	**1125**	**100.0**
9. Has your dentist ever proposed a prevention visit to you?	No	1102	98.0
	Yes	23	2.0
	Tot.	**1125**	**100.0**
10. Do you think that it is helpful to make a prevention visit even if there are no symptoms?	No	30	2.7
	Yes	908	80.7
	Do not know	187	16.6
	Tot.	**1125**	**100.0**

Table 3. Questionnaire administered.

167 from Scientific High School (14.8%), and 105 from Technical High School (9.3%). The university students were further subdivided into the following groups: 122 frequented the Faculty of Law (10.8%), 118 the Faculty of Letters and Philosophy (10.5%), 112 the Faculty of Medicine and Surgery (10.0%), and 123 the Faculty of Mathematical, Physical and Natural Sciences – *SMFN* (10.9%).

Of the entire study population, 45.3% (510 subjects) knew of the existence of oral cancer; among these, 36.9% (444 subjects) do not perceive the seriousness of the malignancy. There is a statistically significant difference in the perception of malignancy between those ones who have heard about oral cancer and those who have not (p<0.0001). Importantly, having a family member who practices a medical discipline significantly improved knowledge of the disease (54.3%) (p<0.0001) (Tab.4).

The highest results were obtained among the University students of scientific faculties, which largely knew about oral cancer (74% Faculty of Medicine and Surgery; 65% Faculty of Mathematical, Physical and Natural Sciences). A university education increases knowledge of oral cancer in a statistically significant way in comparison with the high school students (p<0.0001) (Tabs. 3,5).

Of those interviewed, 81.2% identified smoking as a risk factor, with the highest values found in areas of scientific study (91.1% Faculty of Medicine and Surgery; 86.2% Faculty of Mathematical, Physical and Natural Sciences). Knowledge of oral cancer was found to be lower in subjects with humanistic preparation (73.8% Faculty of Law; 73.7% Faculty of Letters and Philosophy). Although smoking was perceived by the population as a clear risk factor in the aetiopathogenesis of oral cancer, it should be emphasised that alcohol and sunlight were less known

	Question 1: Have you ever heard about oral cancer?			
	No		Yes	
Question 2: Oral cancer is a benign or malignant tumour?	**Frequency**	**Percentage**	**Frequency**	**Percentage**
Malignant	171	27.8	322	63.1
Benign	56	9.1	27	5.3
Do not know	388	63.1	161	31.6
Tot.	**615**	**100.0**	**510**	**100.0**
Presence of family members who practice medical disciplines				
No	478	77.7	347	68.0
Yes	137	22.3	163	32.0
Tot.	**615**	**100.0**	**510**	**100.0**

Table 4. Knowledge of oral cancer in the sample.

	Question 1: Have you ever heard about oral cancer?			
	No		Yes	
Category	**Frequency**	**Percentage**	**Frequency**	**Percentage**
High School students	256	41.6	146	28.6
Classical High School	68	11.1	62	12.2
Scientific High School	123	20.0	44	8.6
Technical High School	65	10.5	40	7.8
University stundents	221	35.9	254	49.8
Law	79	12.8	43	8.4
Letters and Philosophy	70	11.4	48	9.4
Medicine and Surgery	29	4.7	83	16.3
SMFN *	43	7	80	15.7
Other	138	22.5	110	21.6
Total	615	100.0	510	100.0

Faculty of Mathematical, Physical and Natural Sciences

Table 5. Knowledge of oral cancer per category.

factors. Of those interviewed, 42.4% (for alcohol) and 21.1% (for sunlight) considered these factors as possible causes of oral cancer.

Among the High School students, those who attended a scientific high school had a greater knowledge of the risk factors than those who attended a Classical High School or Technical High School. More specifically, with regard to smoking, 83.2% of scientific high school students identified smoking as a clear risk factor compared with 76.9% of those who attended classical high school. There is a statistically significant difference of knowledge of the risk factor "smoke" between the humanistic studies (Classical High School, Faculty of Letters) and scientific studies (Scientific High School, Faculty of Medicine and Surgery) (p = 0.0399).

Importantly, even among high school students, there is a lower perception of the importance of alcohol and sunlight as possible aetiologic factors. Thus, alcohol is recognised as a risk factor by 51.5% of Scientific High School students compared with 38.1% of the students attending Technical High School and 43.8% of the students attending Classical High School. There is a statistically significant difference of knowledge of the risk factor "alcohol" between Scientific and Technical High School (p = 0.0331).

Finally, sun exposure is known as a risk factor by 28.1% of students in Scientific High School compared with 18.5% of the students in Classical High School and 13.3% of the students in Technical High School. There is a statistically significant difference of knowledge of the risk factor "sunlight" between the humanistic studies (Technical High School, Faculty of Letters) and scientific studies (Scientific High School, Faculty of Medicine and Surgery). (p = 0.0057) (Graphs 1,2,3).

Additionally, having a doctor in the family can improve the knowledge of the risk factors involved in oral cancer. In fact, 88.3% of the interviewed students who have a doctor in their family recognised smoking as a risk factor, 50.3% recognised alcohol and 24.3% identified exposure to sunlight as a risk factor.

Regarding the prevention of oral cancer, only 43.3% (487 of 1125 interviewed subjects) were aware of the possibility of preventive health screenings, whereas 80.7% (908 of total) recognised this as a useful event even in the absence of symptoms; however, only 2.8% (32 subjects of 1125) had received a specialist check, with 12.5% (*4 subjects of 32*) of these interviewed students having received a specialist check due to suggestions from their dentist. In our population, only 2% (23 subjects out of 1125) were asked by their own dentist to make a visit for the prevention of oral cancer.

Discussion and conclusions

In general, knowledge of oral cancer is poor among the interviewed people, and the majority of the population was not aware of the existence of oral cancer. Importantly, it should be noted that high school or university courses that specialise in scientific branches provide significantly better awareness of the disease and its risk factors to students enrolled in these courses. In addition, individuals with doctors in the family have a better perception of the disease than the rest of the sample.

Recently in Italy, knowledge of cancer prevention has spread widely, especially regarding lung or breast cancer, for which check-ups and preventive instrumental tests are regularly performed in the population. This culture of prevention is absent for oral cancer, as evident from the results of the study. Therefore, it is crucial to inform and educate the public regarding this serious disease: if this tumour is known and monitored with regular check-ups, it can be prevented or treated effectively.
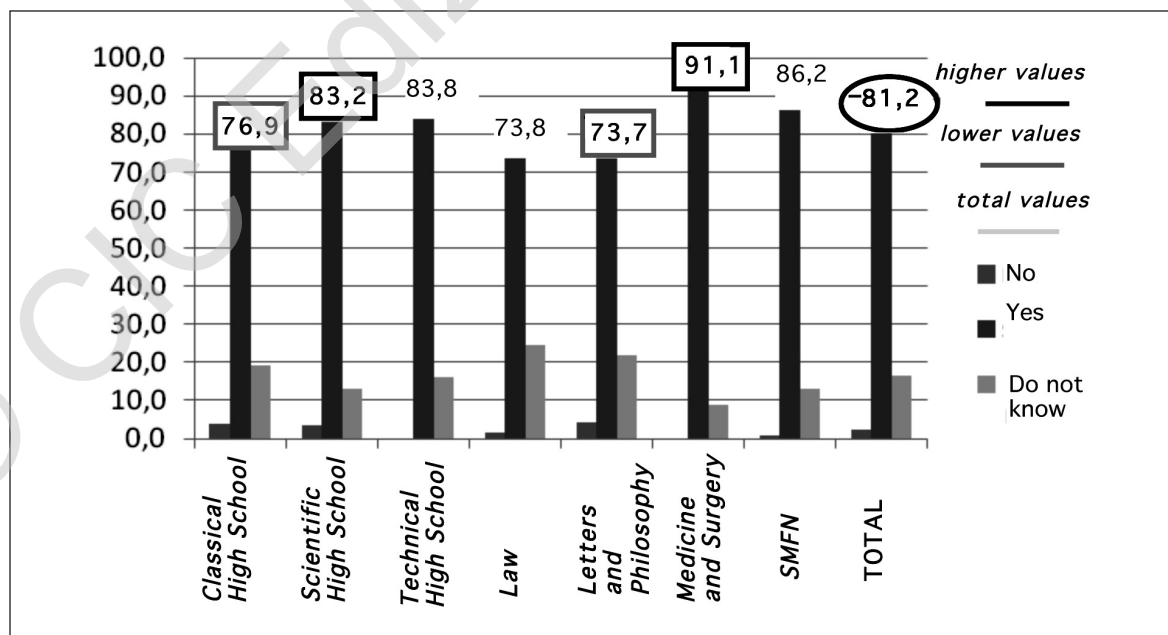
Graphic 1 - Perception of smoking as a risk factor among the subjects who reported being aware of oral cancer.
(QUESTION 3 = Smoking may increase the risk of developing oral cancer?)
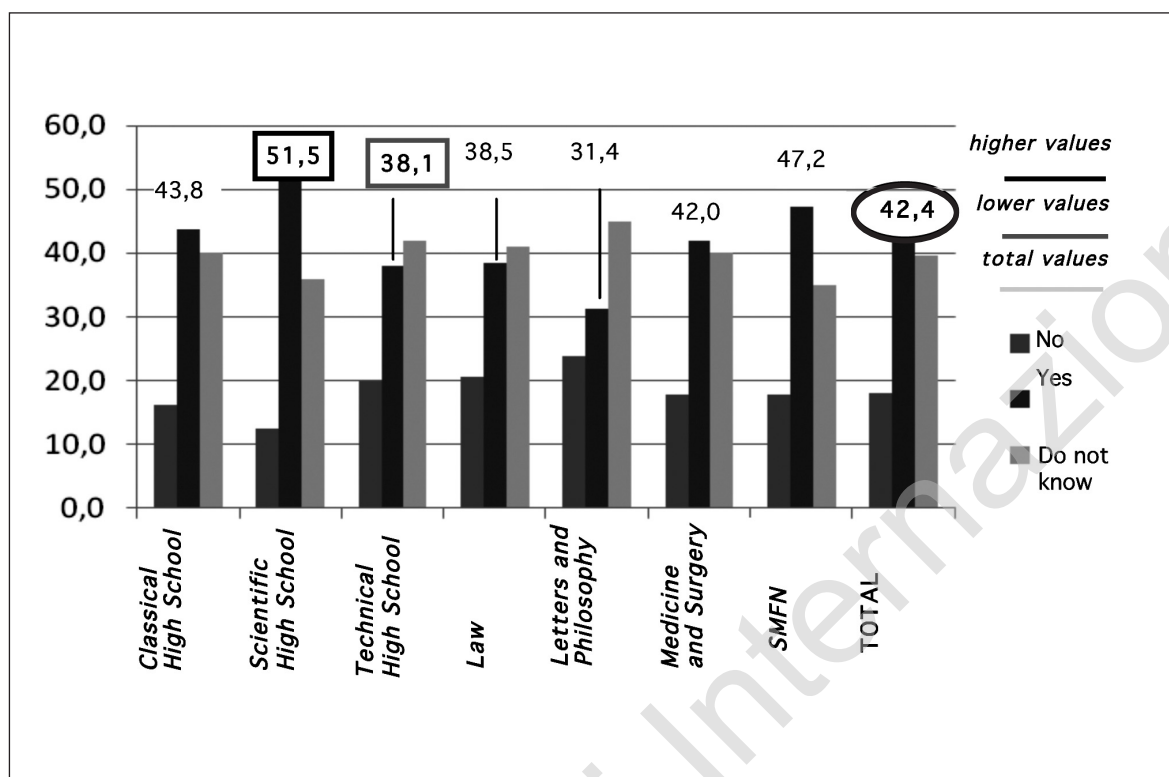
Graphic 2 - Perception of alcohol as a risk factor among the subjects who reported being aware of oral cancer.
(QUESTION 4 = Alcohol may increase the risk of developing oral cancer?)
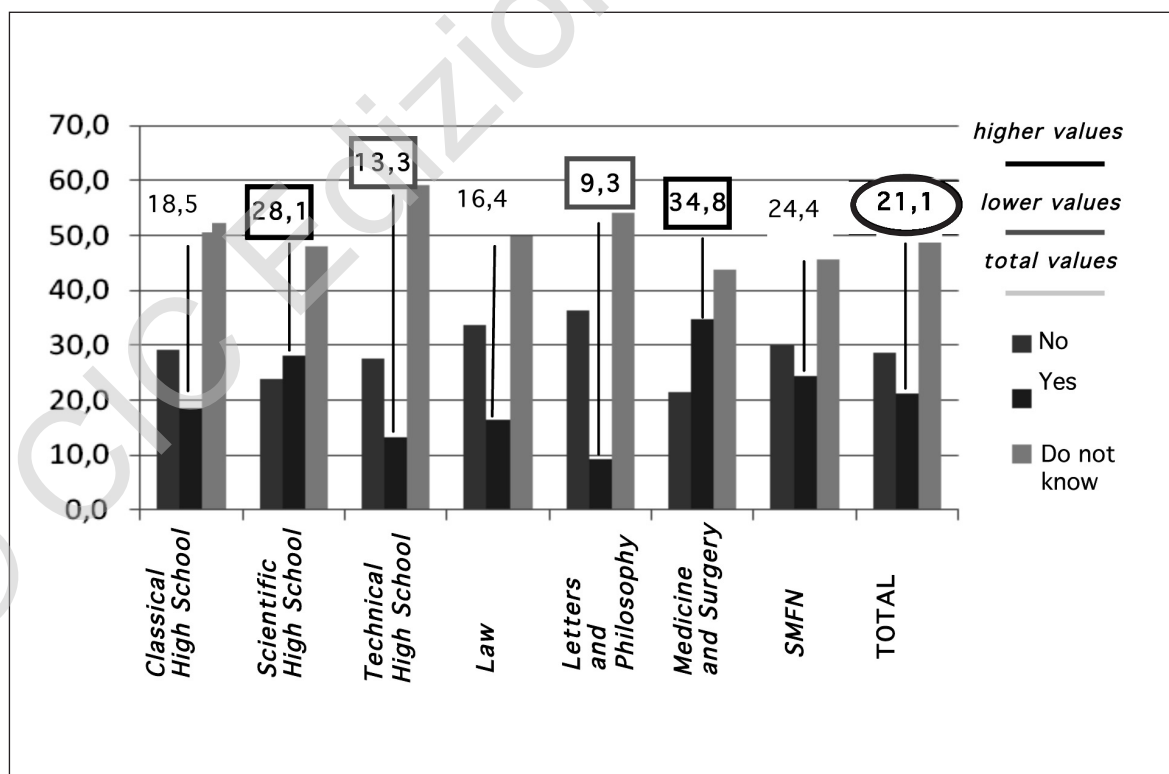
Graphic 3 - Perception of sunlight as a risk factor among the subjects who reported being aware of oral cancer.
(QUESTION 5 = A long exposure to sunlight may contribute to the onset of oral cancer?)

The prevention of oral cancer has a major role in dental practice. Due to the identification of malignant disease and a proper health education, health care professionals can contribute to decreasing the prevalence of this serious disease.

The data obtained from this study highlight the need to increase health education, especially among younger people in high schools and university faculties, with humanistic or technical programs, in which the knowledge regarding prevention is more limited. A delay in the diagnosis and a long waiting period prior to a confirmed diagnosis favour the progression of the tumour to a more advanced stage, placing the life of the patient at serious risk.

Currently, early diagnosis for many neoplastic diseases is a prerequisite to achieve good therapeutic results, with a positive impact in terms of prolonged survival and improved quality of life.

References

1. Jemal A, Siegel R, Ward E, Murray T, Xu J, Thun MJ. Cancer statistics. CA Cancer J Clin 2007;57(1):43-66.
2. Jemal A, Siegel R, Ward E, Hao Y, Xu J, Murray T et al. Cancer statistics. CA Cancer J Clin 2008;58(2):71-96.
3. Mashberg A, Samit AM. Early detection, diagnosis, and management of oral and oropharyngeal cancer. CA Cancer J Clin 1989;39:67-88.
4. Calabrese L, Bruschini R, Ansarin M, Giugliano G, De Cicco C, Ionna F et al. Role of sentinel lymph node biopsy in oral cancer. Acta Otorhinolaryngol Ital. 2006 Dec;26(6):345-9.
5. Silverman S, Gorsky M. Epidemiologic and demographic update in oral cancer: California and national data, 1973-1985. J Am Dent Assoc 1990;120:495-9.
6. http://www.registri-tumori.it
7. Bilancetti M. La responsabilità penale e civile del medico, CEDAM, Padova, 2000.
8. Messadi DV, Wilder-Smith P, Wolinsky L. Improving oral cancer survival: the role of dental providers. J Calif Dent Assoc. 2009 Nov;37(11):789-98.
9. SNLG-ISS (Sistema Nazionale Linee Guida - Istituto Superiore di Sanità). http://www.snlg-iss.it/PNLG/LG/001onco/a-introd.htm
10. Rapido accesso alla diagnosi per il paziente con sospetta patologia oncologica.
11. Yellowitz JA, Horowitz AM, Drury TF, Goodman HS. Survey of US dentists' knowledge and opinions about oral pharyngeal cancer. J Am Dent Assoc 2000;131:653-661.
12. Sciubba JJ. Improving detection of precancerous and cancerous oral lesions. Computer-assisted analysis of the oral brush biopsy. US Collaborative OralCDx Study Group. J Am Dent Assoc 1999 130:1445-1457.
13. www.nidcr.nih.gov/OralHealth/Topics/OralCancer/DetectingOralCancer.htm
14. www.nidcr.nih.gov/OralHealth/Topics/OralCancer/OralCancer.htm
15. Nagler R, Ben-Izhak O, Savulescu D, Krayzler E, Akrish S, Leschiner S et al. Oral cancer, cigarette smoke and mitochondrial 18kDa translocator protein (TSPO) - In vitro, in vivo, salivary analysis.
Biochim Biophys Acta. 2010 May;1802(5):454-61. Epub 2010 Jan 18.
16. Tsai KY, Su CC, Lin YY, Chung JA, Lian IeB. Quantification of betel quid chewing and cigarette smoking in oral cancer patients.
Community Dent Oral Epidemiol 2009; 37: 555-561.
17. Sasco AJ, Secretan MB, Straif K. Tobacco smoking and cancer: a brief review of recent epidemiological evidence. Lung Cancer 2004, 45 (Suppl 2) S3-S9.
18. Petti S, Scully C. Polyphenols, oral health and disease: A review.
J Dent. 2009 Jun;37(6):413-23. Epub 2009 Mar 19.
19. Ogden GR, Wight AJ. Aetiology of oral cancer: alcohol. Br J Oral Maxillofac Surg 1998;36:247-51.
20. Wight AJ, Ogden GR. Possible mechanisms by which alcohol may influence the development of oral cancer. A review. Oral Oncol 1998;34:441-7.
21. Petti S, Scully C. Oral cancer: The association between nation-based alcohol-drinking profiles and oral cancer mortality. Oral Oncol. 2005 Sep;41(8):828-34.
22. Markopoulos A, Albanidou-Farmaki E, Kayavis I.
Actinic cheilitis: clinical and pathologic characteristics in 65 cases.
Oral Diseases 2004, 10, 212-216.
23. Schwartz RA. Therapeutic perspectives in actinic and other keratoses.
Int J Dermatol 1996, 35: 533-538.
24. Barnaby JWJ, Styles AR, Cockerell CJ. Actinic keratoses: differential diagnosis and treatment. Drugs Aging 1997, 11: 186-205.