Open Access Library Journal
2024, Volume 11, e11860
ISSN Online: 2333-9721
ISSN Print: 2333-9705

The Oral Health Status of Pre-Treatment Cancer Patients

Salma Adnane[1*], Mouna Hamza[2], Ihsane Ben Yahya[1]

[1]Department of Oral Surgery, Dental Consultation and Treatment Center, Ibn Rochd University Hospital Center, Casablanca, Morocco
[2]Department of Pediatric Dentistry and Epidemiology, Dental Consultation and Treatment Center, Ibn Rochd University Hospital Center, Casablanca, Morocco
Email: *sallyad993@gmail.com

How to cite this paper: Adnane, S., Hamza, M. and Yahya, I.B. (2024) The Oral Health Status of Pre-Treatment Cancer Patients. *Open Access Library Journal*, **11**: e11860.
https://doi.org/10.4236/oalib.1111860

Received: June 23, 2024
Accepted: September 17, 2024
Published: September 20, 2024

Abstract

Background: Cancer is a real public health problem in the world and one of the most frequent causes of morbidity and mortality [1]. In Morocco, more than 50,000 new cases of cancer have been diagnosed in 2019 [2]. Despite a better understanding of the pathophysiological mechanisms of cancer and the development of more targeted and effective cancer treatments, some of their side effects, especially in the oral cavity, remain unavoidable [3]. **Materials and methods:** The creation of the oral health care unit at the Mohamed VI Center for Cancer Treatment made it possible to carry out a cross-sectional descriptive epidemiological study of 136 patients over a period of 14 months. The objective of this study was to describe the oral status and the need for dental care of patients undergoing cancer treatment. **Results:** Of 658 patients seen in consultation, 136 met the inclusion criteria of the study. 61.8% of patients were male. 54.4% were non-smokers. The average age was 52 years. Our survey revealed that 86.8% of the patients were from a low socioeconomic level and more than 40% were illiterate. Their oral health status was characterized by an average DMFT index of 13.28, an average plaque index and gingival index of 1.95 and 1.75, respectively. More than half of the patients surveyed reported never brushing their teeth. **Conclusion:** The survey conducted in the oral health care unit of the Mohamed VI Center for Cancer Treatment has led to a worrying assessment of the oral health of patients admitted for cancer treatment. The dentist has, therefore a primordial role in the prevention and/or treatment of oral sequels secondary to anti-neoplastic therapies, hence the importance of the patient's care by his dentist before, during and after his chronological treatment. The main objective is to avoid the complications related to these treatments and thus improve the quality of life of patients.

Subject Areas

Dentistry

Keywords

Cancer Therapy, Oral Health, Descriptive Study

1. Introduction

Cancer is an important public health concern in Morocco and around the world [2].

Its global incidence rate is estimated at more than 18 million new cases per year, and more than 9.8 million deaths were attributed to it in 2018. In Morocco, more than 50,000 new cases of cancer were diagnosed in 2019. 65% of cancers diagnosed affected women compared to 35% of men [1].

Multiple cancer therapies, including chemotherapy, radiation therapy, bisphosphonates, stem cell transplant therapies, and targeted therapies, can all lead to substantial oral complications. These treatment modalities can cause significant acute and chronic changes in the oral cavity, where the teeth, periodontics, oral mucous membranes and salivary glands can all be affected [4].

Dentists, therefore, have an important role to play in understanding, managing, reducing or better preventing them [5].

The present study aimed to assess the oral condition of patients candidates for cancer treatments and to highlight the importance of multidisciplinary collaboration between oncologists and dental professionals in the management of cancer patients.

2. Material and Methods

Type of study

This is a descriptive cross-sectional study with prospective recruitment in order to describe the oral condition of patients who are candidates for cancer treatments.

This study was conducted in a fourteen-month period from December 2021 to February 2023. Our survey took place in the dental office of the Mohamed VI Center for the Treatment of Cancers at the Ibn Rochd University Hospital in Casablanca.

This structure was created by the Oral Surgery Department of Dental Consultation and Treatment Center of Casablanca in 2021.

The study population

The study population was represented by a sample of 136 patients seen in consultations at the dental office of the Mohamed VI Center. Patients presenting cancer in all locations and at different stages of the disease who were over 18 years old and who freely expressed their consent to participate in the study, were included. However, patients in progress or who have already received cancer

treatment were excluded from the study.

Ethical considerations

Patients were randomly selected and informed of the purpose of the study. Only patients who freely expressed their consent to participate in the study were recruited. Data collection was carried out with respect of the anonymity of the patients and the confidentiality of their information.

Methods and instruments

We developed an anonymous questionnaire, divided into five parts, each of which includes several components:

Part 1: Socio-demographic characteristics of the patients.

Part 2: Patient's medical and surgical history.

Part 3: Toxic history (consumption of tobacco, alcohol and drugs) and oral hygiene.

Part 4: Characteristics of Cancer (Tumour location, Stage TNM, planned treatment).

Part 5: Oral condition (Plaque Index, Gingival Index, DMFT Index…).

Data processing consisted of a quantitative analysis using SPSS software at the Epidemiology and Bio-statistics Laboratory of the faculty of dentistry in Casablanca.

3. Results

A total of 136 patients were included in the present study. (See Tables 1-7)

The mean age of the study population was 52, 13 ranging from 20 to 82 years. It included 84 (61.8%) males and 52 (38.2%) females. 51.5% of the patients belonged to rural areas versus 48,5% who belonged to urban ones.

The majority of the patients in our study were from a low economic level (86.5%) and 62% were illiterate or have *dropped out* of elementary *school.*

Regarding the health status, 68.4% of the population studied were in good general health while 31.6% presented general pathologies (High blood pressure, Non-insulin-dependent diabetes, Asthma, chronic renal failure, hypothyroidism, Parkinson).

27.9% of the patients surveyed were taking general treatments (antihypertensive, oral antidiabetic, bronchodilator, insulin, thyroid hormone).

Of the 136 patients in the study, 74 were non-smokers (54.4% of the sample) and 62 were or had been smokers (45.6% of the sample). At the time of the appointment, 26 patients were still smokers, 36 were weaned. The former smokers had stopped smoking on average seven years before the diagnosis of their cancer. Among the 26 patients who smoked, the average tobacco consumption was 29.8 pack-years. The mean duration of use was 29.58 years.

Concerning the alcohol consumption, 43 were or had been alcohol users (31.6% of the sample) and 93 had never consumed alcohol, (68.4% of the sample).

At the time of the appointment, 12 patients were still using it, 31 were weaned. The 31 weaned patients had stopped drinking on average 11.26 years before the cancer was diagnosed. In the 12 patients who consumed alcohol, the average consumption was 1.33 glasses per day. The mean duration of use, collected from

12 patients, was 26.58 years.

17 patients of our sample used drugs (cannabis and hookah) and this, coupled with tobacco and alcohol consumption. The average duration of use was 17.79 years.

Regarding the oral hygiene practises, 72% of patients reported never attending dental visits. More than half the sample (58,1%) never brushed their teeth and rinsed only with water after meals. 41.2% of the study population used a toothbrush and fluoride toothpaste for brushing, 13.2% used a mouthwash for rinsing and no patient in the sample reported using interdental brushes and interdental floss as oral hygiene tools

Relating to cancer data, our survey revealed that the most common anatomical site of cancer was cavum (47.1%), followed by breast cancer (30.1%). Other locations were found including larynx (8.1%), tongue (7.4%), prostate (5.9%), lung and kidney (1.5%). The most frequently found histological type is undifferentiated carcinoma of the nasopharyngeal type (UCNT) (47.1%) followed by ductal carcinoma NST (27.2%).

The tumour staging based on TNM Classification showed that 0.7% of patients were diagnosed at stage 1, 69.1% were diagnosed at stage 2, 24.3% were diagnosed at stage 3, 0.7% were diagnosed at stage 4 and for 5.1% of patients, the stage of cancer was not determined.

Table 1. Socio-demographic characteristics of patients.

Sex	**Number of patients**	**%**
Female	52	38.2
Male	84	61.8
Residence		
Urban	66	48.5
Rural	70	51.5
Economic level		
Low	118	86.8
Moderate	16	11.8
High	2	1.5
Intellectual level		
Illiterate	51	37.7
Elementary school	33	24.3
High school	42	30.9
College	10	7.4
Total	**136**	**100**

51.5% of patients were planned for chemoradiotherapy and 42.6% were planned for surgery and chemoradiotherapy .

All patients included in this study were screened. Plaque Index (PI), Gingival Index (GI) and DMFT score were used to score the oral hygiene status of patients.

The PI and GI of each patient were determined by summing the values obtained for each tooth and calculating the averages.

The average of the Plaque Index was 1,95. The standard deviation was 0.58. The majority of patients (84.6%) had a Plaque Index between 2 and 3.

The average Gingival Index of our study population was 1.75. The standard deviation was 0.57, 78.7% of patients had a high Gingival Index ranging from 2 to 3.

The average decayed/missing/filled teeth (DMFT) score was 13.28, 79.4% of patients had a poor oral hygiene, whereas 13.2% had fair oral hygiene, and only 7.4% of patients had a good oral hygiene status.

Table 2. Smoking status.

	Number of patients	%
Smoker (n = 136)		
Yes	26	19.1
No	74	54.4
Weaned	36	26.5
Pack year		
10	2	1.5
20	7	5.1
25	4	2.9
30	3	2.2
35	2	1.5
40	4	2.9
45	1	0.7
50	3	2.2

Table 3. Alcohol consumption.

	Number of patients	%
Alcohol (n = 136)		
Yes	12	8.8
No	93	68.4
Weaned	31	22.8
Glasses per day		
1	8	5.9
2	4	2.9

Table 4. Drug use.

	Number of patients	%
Drug (n = 136)		
Yes	17	12.5
No	119	87.5
Total	**136**	**100**

Table 5. Tooth brushing frequency.

Tooth brushing frequency	Number of patients	%
Never	79	58.1
Once a day	46	33.8
Twice a day	10	7.4
Three times a day	1	0.7

Table 6. Frequency of dental visits.

Dental visits	Number of patients	%
Never	98	72.1
If necessary	37	27.2
Occasional	1	0.7
Total	**136**	**100**

Table 7. Histological type of cancer.

	Number of patients	%
Ductal carcinoma NST	37	27.2
Squamous cell carcinoma	23	16.9
Undifferentiated carcinoma of nasopharyngeal type	64	47.1
Infiltrating lobular carcinoma	4	2.9
Adenocarcinoma	8	5.9
Total	**136**	**100**

4. Discussion

Cancers are one of the most common causes of death worldwide causing around 10 million deaths in 2019 and its incidence continues to increase [1].

Many cancer treatment modalities, such as surgery, radiotherapy, chemotherapy, and supportive care measures including antiresorptive therapies, can lead to different oral complications [4].

The oral health professionals play an important role in the management of preexisting poor dental conditions and prevention and management of emerging oral side effetcs of cancer therapies [6].

Our study investigated the oral health status in cancer patients before beginning the anti-neoplastic treatment. The results on a representative sample of 136 patients showed alarming outcomes.

The demographics of this cohort are consistent with the results of several studies carried out in different countries in terms of sex, age, intellectual and socioeconomic status [7]-[14].

According to our study, males were more prevalent than women and the average age was 52 years. The majority of patients (86.5%) were from low economic levels, 62% were illiterate or had dropped out from elementary school and 51.5% of them were coming from rural areas.

Regarding the oral health practises, a strikingly high portion of patients (72 %) stated that they have never consulted a dentist and more than half the sample (58.1%) never brushed their teeth. These findings are similar to those found in studies in Algeria, Mali and France where a high number of patients reported attending dental visits only in case of emergency as well as a very low frequency of toothbrushing and use of oral hygiene tools [12] [15] [16].

These results may be due to an inconsistency in the importance of oral health, which may be associated with the socioeconomic status of the patients. Indeed, it is well proved in several studies that low socioeconomic status is closely associated with poor oral health but also with increased risk for oral cancer. Various studies have shown an impact of SES on the oral health of an individual and awareness [17]. In fact, financial considerations, educational status, and occupation of the patient significantly impact oral health care. Oral and dental health practices were found to be better in patients with high socioeconomic status. On the opposite, the lower socioeconomic strata have poor oral hygiene practices which might be related to low affordability and low level of awareness [18].

Social inequalities when it comes to cancer incidence are also well described.

In Danemark, analysis of data showed that the incidence of most cancers increases as education and income level decreases, particularly for cancers linked to smoking or lifestyle [19].

Regarding the toxic history, in our study, many people reported regularly smoking, drinking alcohol or using drugs, some moderately, but some also heavily and often.

However, when compared with other studies, tobacco and alcohol consumption was reported to be less in this cohort of patients [12] [20]. In fact, many patients reported cutting down on their tobacco and alcohol intake following cancer diagnosis.

According to many researches, smoking, alcohol consumption and using drugsare causally linked with multiple types of cancer (oral cavity, pharynx, larynx, esophagus, colorectalcancer, liver, and female breast cancer) [21]. These harmful habits are also associated with higher risks of recurrence, emergence of new primary cancers, and worsened treatment outcomes, such as decreased effectiveness and increased risk of complications and can also be the cause of death [22].

Concerning the oral health, assessment of oral hygiene indices and dental status among cancer patients before initiating their cancer therapies or treatments are lacking in the literature. In fact, most previous studies found while searching have been conducted on patients after cancer therapy.

In the present study, the evaluation of the incidence of dental caries and periodontal disease exposed a compromised oral health condition in cancer patients.

The average Plaque Index and Gingival Index was respectively 1.95 and 1.75 in our study versus 1.1 and 0.3 found by Zioueche in a similar survey in France [20]. The average decayed/missing/filled teeth (DMFT) score found in our study was 13.28. It should be noted that the highest component of the DMFT in the current study was the missing teeth (M).

A previous similar study conducted in Korea by Kim YS *et al.* revealed that the DMFT score was 5.5 [23].

Busjan et al. reported the DMF score in newly diagnosed cancer patients which was 19.56 and the most significant component was the filled teeth [24].

In our study, 79.4% of patients had a poor oral hygiene, whereas 13.2% had fair oral hygiene, and only 7.4% of patients had a good oral hygiene status.

Our observation is supported by other studies measuring the oral hygiene of newly diagnosed cancer patients [25].

Some authors suggest that patients with periodontal disease have an increased risk of developing oral cancer, and the severity of periodontitis correlates with the appearance of oral squamous cell carcinoma [26].

Hujoel *et al.* found that gingival inflammation could be a risk factor for several types of cancer development [27].

Our data confirm that most cancer patients present with poor oral health which certainly increase risk for oral complications during and after treatment. Strengthening *collaboration between oral* health professionals and other health professionals in the cancer care *team* is essential. Oncologists should recognize the importance of early referral for dental evaluation and appropriate intervention and prophylactic measures to detect possible sources of infection that could complicate or delay cancer therapies.

In fact, the dentists play a critical role in managing cancer patients. They are involved in the prevention, diagnosis and delivery of oral healthcare before, during and following cancer treatment.

It was with this in mind that the project of creating a dental office within a specialized center for the treatment of cancers was launched by the oral surgery department of the dental consultation and treatment center of Casablanca.

The project consisted of the development of an autonomous dental Office within the Mohamed VI Center for the treatment of Cancers at the Ibn Rochd University Hospital of Casablanca including a consultation room, a fully equipped treatment room with a dental radiology and a sterilization room.

The purpose of this structure was to improve access to oral health care for cancer patients who are candidates or undergoing cancer therapy and consequently

improve their quality of life. The aim was also to highlight the need for prevention and dental care in this category of patients.

The strategy focused on 3 key items development:

1) Improvement of the patient care path between the Mohamed VI Center for the treatment of Cancers and the Dental Consultation and Treatment Center of Casablanca through the establishment of a consultation managed by the Oral Surgery Department.

2) Assessing the dental and periodontal care needs of cancer patients and prevent the occurrence of any oral infectious or inflammatory complications that may occur during and after antineoplastic treatment.

3) Sensitizing students in dental medicine on their role as oral health professional to be part of the medical team treating the cancer patient.

5. Conclusion

Our survey resulted in a worrying assessment of the oral health of patients admitted for the treatment of Cancer.

Cancer patients have complex oral health needs, often requiring oral evaluation prior to initiation of cancer treatment but also require close follow-up during and after their treatments to prevent acute and long term oral health complications and ensure a better quality of life.

Patient Permission

The patients were informed and gave their consent for the presentation and publication of this work.

Conflicts of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

[1] World Health Organization (WHO) (2020) Global Health Estimates 2020: Deaths by Cause, Age, Sex, by Country and by Region, 2000-2019.

[2] Ministère de la Santé Fondation Lalla Salma-Maroc (2019) Etat des lieux de la mise en œuvre du plan national de prévention et de contrôle du cancer 2010-2019.

[3] Wong, H.M. (2014) Oral Complications and Management Strategies for Patients Undergoing Cancer Therapy. *The Scientific World Journal*, **2014**, Article ID: 581795. https://doi.org/10.1155/2014/581795

[4] Harris, J.A., Ottaviani, G., Treister, N.S. and Hanna, G.J. (2022) An Overview of Clinical Oncology and Impact on Oral Health. *Frontiers in Oral Health*, **3**, Article ID: 874332. https://doi.org/10.3389/froh.2022.874332

[5] Messadi, D.V., Wilder-Smith, P. and Wolinsky, L. (2009) Improving Oral Cancer Survival: The Role of Dental Providers. *Journal of the California Dental Association*, **37**, 789-798. https://doi.org/10.1080/19424396.2009.12223033

[6] Samim, F., Epstein, J.B., Zumsteg, Z.S., Ho, A.S. and Barasch, A. (2016) Oral and Dental Health in Head and Neck Cancer Survivors. *Cancers of the Head & Neck*, **1**, Article No. 14. https://doi.org/10.1186/s41199-016-0015-8

[7] Chbani IH, L., Berraho, M., Mesbahi, O., Nejjari, C. and Amarti, A. (2012) Aspects épidémiologiques et anatomopathologiques des cancers dans la région de Fès-Boulemane (Maroc). 1 Service d'Anatomie pathologique; 2 Laboratoire d'Épidémiologie et de Santé Publique; 3 Service d'Oncologie médicale, Centre hospitalier universitaire (CHU) Hassan II, Fès (Maroc).

[8] Ministère de la santé (n.d.) Plan Pour la Lutte Contre le Cancer en Tunisie 2015-2019 république tunisienne.

[9] Institut National du Cancer edition (2022) Panorama des cancers en France.

[10] Société canadienne du Cancer (2019) Vue d'ensemble des statistiques sur le cancer.

[11] Chaima, H. (2022) Les délais diagnostiques et thérapeutiques en oncologie médicale. Thèse pour l'obtention du doctorat en médecine.

[12] Wahiba, B. and Sarra, B. (2019) Description de l'etat bucco-dentaire des patients admis au service d'oncologie chu tlemcen.

[13] Critchlow, S.B., Morgan, C. and Leung, T. (2014) The Oral Health Status of Pre-Treatment Head and Neck Cancer Patients. *British Dental Journal*, **216**, e1. https://doi.org/10.1038/sj.bdj.2013.1246

[14] Rupe, C., Basco, A., Schiavelli, A., Cassano, A., Micciche', F., Galli, J., *et al.* (2022) Oral Health Status in Patients with Head and Neck Cancer before Radiotherapy: Baseline Description of an Observational Prospective Study. *Cancers*, **14**, Article No. 1411. https://doi.org/10.3390/cancers14061411

[15] Keita, M.F. (2022) Evaluation de l'état buccodentaire chez les patients sous chimiothérapie au CHME-Luxembourg (MALI).

[16] Rouers, M., *et al.* (2016) État buccodentaire des patients avant radiothérapie des voies aérodigestives supérieures: Analyse prospective de 48 patients. *Cancer/Radiothérapie*, **20**, 199-204.

[17] Adeniyi, A.A., Oyapero, A.O., Ekekezie, O.O. and Braimoh, M.O. (2016) Dental Caries and Nutritional Status of School Children in Lagos, Nigeria—A Preliminary Survey. *Journal of West African College of Surgeons*, **6**, 15-38.

[18] Aslan Ceylan, J., Aslan, Y. and Ozcelik, A.O. (2022) The Effects of Socioeconomic Status, Oral and Dental Health Practices, and Nutritional Status on Dental Health in 12-Year-Old School Children. *Egyptian Pediatric Association Gazette*, **70**, Article No. 13. https://doi.org/10.1186/s43054-022-00104-3

[19] Dalton, S.O., Schüz, J., Engholm, G., Johansen, C., Kjær, S.K., Steding-Jessen, M., *et al.* (2008) Social Inequality in Incidence of and Survival from Cancer in a Population-Based Study in Denmark, 1994-2003: Summary of Findings. *European Journal of Cancer*, **44**, 2074-2085. https://doi.org/10.1016/j.ejca.2008.06.018

[20] Zioueche, A. (2020) État bucco-dentaire des patients irradiés de la sphère cervico-faciale: Avant et un an après radiothérapie. Chirurgie.

[21] INCa (2016) Argumentaire-Arrêt du tabac dans la prise en charge du patient atteint de cancer/Systématiser son accompagnement, outils pour la pratique.

[22] Lassig, A.A.D., Yueh, B. and Joseph, A.M. (2012) The Effect of Smoking on Perioperative Complications in Head and Neck Oncologic Surgery. *The Laryngoscope*, **122**, 1800-1808. https://doi.org/10.1002/lary.23308

[23] Kim, Y., Jung, Y., Kim, B. and Kim, E. (2018) Oral Health of Korean Patients with Head and Neck Cancer. *Journal of Cancer Prevention*, **23**, 77-81.

https://doi.org/10.15430/jcp.2018.23.2.77

[24] Busjan, R., Hasenkamp, J., Schmalz, G., Haak, R., Trümper, L. and Ziebolz, D. (2017) Oral Health Status in Adult Patients with Newly Diagnosed Acute Leukemia. *Clinical Oral Investigations*, **22**, 411-418. https://doi.org/10.1007/s00784-017-2127-x

[25] Rinčić, N., Božić, D., Rinčić, G., Gaćina, P. and Plančak, D. (2016) Evaluation of Periodontal Parameters in Patients with Early Stage Chronic Lymphocytic Leukemia. *Acta Stomatologica Croatica*, **50**, 23-33. https://doi.org/10.15644/asc50/1/4

[26] Komlós, G., Csurgay, K., Horváth, F., Pelyhe, L. and Németh, Z. (2021) Periodontitis as a Risk for Oral Cancer: A Case-Control Study. *BMC Oral Health*, **21**, Article No. 640. https://doi.org/10.1186/s12903-021-01998-y

[27] Hujoel, P.P., Drangsholt, M., Spiekerman, C. and Weiss, N.S. (2003) An Exploration of the Periodontitis-Cancer Association. *Annals of Epidemiology*, **13**, 312-316. https://doi.org/10.1016/s1047-2797(02)00425-8