



ORAL HEALTH STATUS IN TWO COHORTS OF CANCER PATIENTS: A CASE-CONTROL STUDY

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INTRODUCTION

Cancer patients have diverse care needs, both from a systemic and local point of view. In particular, the interest of clinical practice and research has recently focused on the oral care management, in order to prevent the predictable oral complications [1]. In particular, the dental professionals are mostly involved in the management of patients suffering from Head and Neck Cancers (HNC) and Bone Metastatic Cancers (BMC), due to the well-known plethora of adverse events described for these cancers [2] [3] [4]. Specifically, BMC patients and HNC patients require specific dental care in order to prevent and manage the adverse effects of radiotherapy (RT) and bone antiresorptive (AR) drugs. The aim of this observational case-control study was to compare the oral health (OH) status between BMC patients (case group) and HNC patients (control group). Moreover, secondary outcome was to identify any risk factors associated with poor OH status.

METHODS AND MATERIALS

The present retrospective case-control study was approved by the EC of Policlinico Universitario A. Gemelli IRCCS, and included BMC (case) patients and HNC (controls), matched for age, in a 1:3 ratio. All patients were evaluated at Fondazione Policlinico A. Gemelli, Rome.

The OH status was clinically and radiographically evaluated using the DMFT index, a full periodontal charting and a radiological examination (orthopantomographs). The OH status was defined as "poor" in cases of DMFT ≥ 13 and/or stage III or IV periodontitis. A univariate statistical analysis was performed to detect the association between the different clinical variable and OH. The associated variables underwent a multivariate logistic regression, in order to retrieve the independent risk factors for poor OH.

Inclusion criteria

Case group: BMC patients having received a prescription of antiresorptive drugs, age > 18 years.
Control group: HNC diagnosis, indication for RT, age > 18 years.

Exclusion criteria

Case Group: patients having already received RT in the head and neck region, oral metastasis.
Control group: impossibility of accurately evaluating OH conditions (i.e., outcomes of oncologic surgery incompatible with the dental procedures to diagnose caries and periodontitis), patients having already received RT in the head and neck region, previous administration of AR.

Table 1. Inclusion and exclusion criteria.

Variable	HNC	BMC	Total	Statistical significance
Sex	Men	111 (63.1%)	11 (18.9%)	122 (70.5%)
	Women	65 (36.9%)	47 (81.1%)	112 (29.5%)
	Total	176 (100%)	58 (100%)	234 (100%)
Age (years)	Mean (Range, SD)	60.4 (22-92; SD: 12.9)	59.6 (34-83; SD: 12.4)	60.1 (22-92; SD: 12.8)
				ANOVA Test - p= 0.71
Age (decades)	0-49	35 (19.9%)	15 (25.9%)	50 (21.4%)
	50-59	47 (26.7%)	14 (24.1%)	61 (26.1%)
	60-69	49 (27.8%)	13 (22.4%)	62 (26.5%)
	>70	45 (25.6%)	16 (27.6%)	61 (26.1%)
	Total	176 (100%)	58 (100%)	234 (100%)
Smoking	Smokers	110 (62.5%)	10 (17.2%)	120 (51.3%)
	Non smokers	66 (37.5%)	48 (82.8%)	114 (48.7%)
	Total	176 (100%)	58 (100%)	234 (100%)
Diabetes	Yes	8 (4.5%)	2 (3.4%)	10 (4.3%)
	No	168 (95.5%)	56 (96.6%)	224 (95.7%)
	Total	176 (100%)	58 (100%)	234 (100%)

Table 2. Demographic information of included patients.

Variable	HNC	BMC	Total	Statistical significance
DMFT ≥ 13	Yes	115 (65.3%)	19 (32.7%)	134 (57.3%)
	No	61 (34.7%)	39 (67.3%)	100 (42.7%)
	Total	176 (100%)	58 (100%)	234 (100%)
DMFT	Mean (Range, SD)	17.1 (0-32; SD: 9.1)	11.5 (1-32; SD: 7.7)	15.7 (1-32; SD: 9.1)
				ANOVA Test - p<0.0001
Periodontitis (Stage)	No Periodontitis	36 (20.5%)	21 (36.2%)	57 (24.4%)
	Stage 1	22 (12.5%)	15 (25.9%)	37 (15.8%)
	Stage 2	21 (11.9%)	8 (13.8%)	29 (12.4%)
	Stage 3	38 (21.6%)	5 (8.6%)	43 (18.4%)
	Stage 4	59 (33.5%)	9 (15.5%)	68 (29%)
Total	176 (100%)	58 (100%)	234 (100%)	
Periodontitis (Grade)	No Periodontitis	36 (20.5%)	21 (36.2%)	57 (24.4%)
	Grade A	39 (22.2%)	21 (36.2%)	60 (25.6%)
	Grade B	59 (33.5%)	10 (17.2%)	69 (29.5%)
	Grade C	42 (23.8%)	6 (10.3%)	48 (20.5%)
	Total	176 (100%)	58 (100%)	234 (100%)
Edentulism	Yes	8 (4.5%)	1 (1.7%)	9 (3.8%)
	No	168 (95.5%)	57 (98.3%)	225 (96.2%)
	Total	176 (100%)	58 (100%)	234 (100%)
Teeth in need of extraction	Mean (Range, SD)	2.9 (0-16; SD: 3.7)	1.3 (0-16; SD: 2.7)	2.5 (0-16; SD: 3.6)
				ANOVA Test - p=0.005
Oral Health	Poor	139 (78.9%)	23 (39.6%)	162 (69.2%)
	Good	37 (21.1%)	35 (60.4%)	72 (30.8%)
	Total	176 (100%)	58 (100%)	234 (100%)

Table 3. Univariate analysis of the outcome variables.

RESULTS

The final sample included 234 patients (i.e., 58 BMC and 176 HNC). The mean age was 60.2 (SD: 12.8). One hundred and sixty-two patients (69.2%) showed a poor OH. Among the HNC patients, 139 (78.9%) were affected by poor OH; compared to 23 (39.6%) among the BMC patients. Data regarding the overall population are described in table 2. At multivariate analysis, **poor oral health** was associated with **HNC** (OR: 3.99, p= 0.002), as well as with **age** (OR for different decades: 50-59 years OR: 6.87, p<0.0001, 60-69 years OR: 11.82, p<0.0001, 70 years or older OR: 33.16, p<0.0001), **smoking** (OR: 4.01, p=0.001) and **sex** (OR: 2.12, p=0.07). Also a **DMFT score ≥ 13** was associated with **HNC** (OR: 3.31, p= 0.003), **age** (OR for different decades: 50-59 years OR: 5.96, p<0.0001, 60-69 years OR: 5.12, p<0.0001, 70 years or older OR: 18.83, p<0.0001) and **smoking** (OR: 2.11, p= 0.27). As for the **severe periodontitis**, an association was found with **HNC** (OR: 2.47, p= 0.03), **age** (OR for different decades: 50-59 years OR: 3.23, p=0.018, 60-69 years OR: 9.42, p<0.0001, 70 years or older OR: 14.41, p<0.0001) and **smoking** (OR: 3.22, p=0.001) (Table 4 a,b,c).

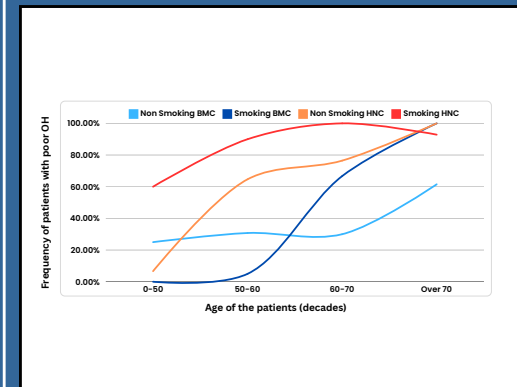


Figure 1. Frequency of Oral Health for each age decade stratified according to smoking habit and oncologic cohort.

CONCLUSIONS

This is the first study to examine the OH status in two different cohorts of cancer patients. HNC patients have a poorer OH compared to BMC patients at first dental visit. Nevertheless, smoking habit and age remain important risk factors for poor OH.

Predictors	Poor OH			
	OR	95% CI	p-value	
Oncologic cohort	BMC	1.0 (Ref)		
	HNC	3.99	1.67-9.51	0.002
Age (decades)	0-49	1.0 (Ref)		
	50-59	6.87	2.58-18.24	<0.0001
	60-69	11.82	4.2-33.4	<0.0001
	>70	33.16	10.2-107.9	<0.0001
Smoking	No	1.0 (Ref)		
	Yes	4.01	1.78-9.04	0.001
Sex	Female	1.0 (Ref)		
	Male	2.12	0.97-4.63	0.07

Predictors	DMFT ≥ 13			
	OR	95% CI	p-value	
Oncologic cohort	BMC	1.0 (Ref)		
	HNC	3.31	1.5-7.29	0.003
Age (decades)	0-49	1.0 (Ref)		
	50-59	5.96	2.43-14.63	<0.0001
	60-69	5.12	2.11-12.45	<0.0001
	>70	18.83	6.96-50.9	<0.0001
Smoking	No	1.0 (Ref)		
	Yes	2.11	1.08-4.07	0.027
Sex	Female	1.0 (Ref)		
	Male	1.19	0.61-2.31	0.6

Predictors	Severe Periodontitis			
	OR	95% CI	p-value	
Oncologic cohort	BMC	1.0 (Ref)		
	HNC	2.47	1.08-5.61	0.03
Age (decades)	0-49	1.0 (Ref)		
	50-59	3.23	1.22-8.55	0.018
	60-69	9.42	3.52-25.16	<0.0001
	>70	14.41	5.24-39.63	<0.0001
Smoking	No	1.0 (Ref)		
	Yes	3.22	1.66-6.26	0.001
Sex	Female	1.0 (Ref)		
	Male	1.51	0.79-2.91	0.21

Table 4. Multilogistic regression for Oral Health, DMFT and Severe Periodontitis.

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