



Identifying Generational Risk Factors of Oral Tongue Squamous Cell Carcinoma

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BACKGROUND

Oral Tongue Squamous Cell Carcinoma (OTSCC) is defined as squamous cell carcinoma of the anterior 2/3 of the tongue.

Clinical Course

- 5-year survival for stage I and II OTSCC is around 67% and 51% respectively
- Treatment: partial glossectomy w/o postoperative radiation
- Speech and swallowing may be impacted
- Significant risk of second primary head and neck cancer and 33% recurrence rate
- Classical risk factors: smoking/chewing tobacco, periodontal disease, betel nut use
- Increasing incidence in patients <50yo over past 20 years with decline in risk factors**

STUDY DESIGN

Comprehensive Questionnaire

- Demographics (DOB, race, sex, zip code)
- PMH (cancer, immune conditions, allergies, chronic illness, medications, etc.)
- Prior Exposures (drugs, diet, supplements, probiotics, radiation, H&N surgery, etc.)
- Oral PMH (dental work, oral conditions, etc.)
- Viral exposure (HPV, EBV, herpes, HIV, STIs, etc.)
- Dietary habits potentially leading to mucosal damage

Distribution

- Inclusion criteria: OTSCC as pathological diagnosis
- Exclusion criteria: >85yo
- Platform: Qualtrics (FERPA- and HIPAA-compliant)



Initial email w/ link and random ID #



Phone call 1-2 days after clinic visit



Email reminder 1-3 weeks later

Response and Analysis

- 66 patients individually contacted
- 29 total respondents; 43.9% response rate
- 79.3% respondent completion rate (23/29)

Data Analysis:

- R 4.0.2, RStudio, IBM SPSS 26, GraphPad Prism 8, Microsoft Excel
- Barnard's two-sided Exact Test, Student's two-sided t Test

RESULTS

Demographics

Bins:

- Younger ≤ 45 yrs of age at initial diagnosis
- Older ≥ 55 yrs of age at initial diagnosis

Table 1: Gender and racial distribution of all study respondents. No significant differences in gender distribution by age cohort were found.

	Gender				Race	
	Female		Male		White/Caucasian	
	Count	Percent (of subgroup)	Count	Percent (of subgroup)	Count	Percent (of subgroup)
Younger	7	53.8%	6	46.1%	10	76.9%
Older	8	69.2%	5	50%	11	84.6%
Middle	1	33.3%	2	66.7%	2	66.7%

Substance Use

N ≤ 1 positive response for:

- Betel nut use
- Environmental exposure to radiation
- Environmental exposure to known carcinogens

Table 2: Self-reported substance use of study respondents. No significant differences by age cohort.

Tobacco	Younger	Older	SUM	P-value	Alcohol	Younger	Older	SUM	P-value
#Yes	5	5	10	p=1	#Yes	9	9	18	p=1
#No	5	7	13		#No	1	2	3	
Total	10	13	23		Total	10	11	21	
Marijuana	Younger	Older	SUM	P-value	Vaped	Younger	Older	SUM	P-value
#Yes	4	4	8	p=1	#Yes	1	0	1	p=0.3614
#No	6	8	14		#No	9	12	19	
Total	10	12	22		Total	10	12	20	

Oral Cavity Medical History

Table 3: Self-reported use of prior oral health medical conditions of study respondents. No significant differences by age were found.

Regular Gum Use	Younger	Older	SUM	P-value	
#Yes	5	7	12	p=1	
#No	5	6	11		
Total	10	13	23		

Oral Appliance Use	#Yes	Retainers	Braces	Night Guard	Herbst Appliance	P-value
Younger	4/9	4	4	2	1	p=1
Older	5/11	2	1	4	0	

Oral Health Conditions	#Yes	Bruxism	Leukoplakia	Lichen planus	Thrush	Tongue ulcers	P-value
Younger	3/9	3	0	0	0	0	p=0.0963
Older	7/9	4	2	2	1	4	

DISCUSSION

- No significant subgroup differences in demographics or family hx of cancer
- Significant differences in oral health between younger vs older patients:
 - Older patients more likely to have had prior oral damage, particularly non-wisdom tooth extraction and root canals
 - Younger patients more likely to have oral herpes-like recurrent ulcers
- Differences in dietary habits:
 - Younger patients consume significantly higher amounts of high sodium meals and processed meats

Working Hypotheses

- Older patients: damage from tooth extraction may contribute to dysplasia
- Younger patients:
 - Damage from recurrent ulcers may progress to dysplasia
 - Higher sodium consumption affects oral microbiome
 - Chronic inflammation or weaker immune ecosystem

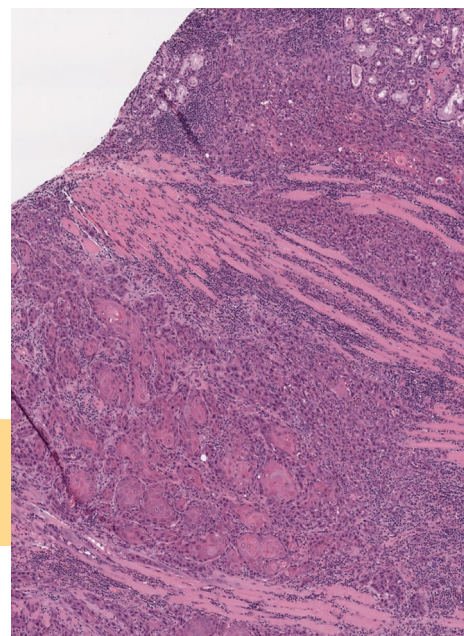


Figure 1: OTSCC histology. The Cancer Genome Atlas

Future Directions

- Increase sample size and further compare:
 - Types of bacterial and viral infections
 - Medication use
 - Temporal relationship of oral lesions/damage with OTSCC diagnosis
 - Tumor staging and recurrence

Oral Cavity Medical History

Table 4: Self-reported oral cavity medical history of study respondents. Older patients had significantly higher frequencies on non-wisdom tooth extraction while younger patients had significantly higher rates of recurrent ulcers.

Fillings	Younger	Older	SUM	P-value	Root Canal	Younger	Older	SUM	P-value
#Yes	7	12	19	p=0.0970	#Yes	2	9	11	**p=0.0331
#No	2	0	2		#No	7	3	10	
Total	9	12	21		Total	9	12	21	
Wisdom Teeth Extraction	Younger	Older	SUM	P-value	Dental Implant	Younger	Older	SUM	P-value
#Yes	7	9	16	p=1	#Yes	1	4	5	p=0.2244
#No	2	2	4		#No	8	7	15	
Total	9	11	20		Total	9	11	20	
Non-Wisdom Teeth Extraction	Younger	Older	SUM	P-value	Dental Whitening	Younger	Older	SUM	P-value
#Yes	0	9	9	**p=0.0004	#Yes	3	5	8	p=1
#No	9	3	12		#No	5	7	13	
Total	9	12	21		Total	8	13	21	
Oral Recurrent Ulcers	Younger	Older	SUM	P-value	Labial Recurrent Ulcers	Younger	Older	SUM	P-value
#Yes	5	2	8	*p=0.0431	#Yes	4	3	7	p=0.3821
#No	4	10	13		#No	5	9	14	
Total	9	12	21		Total	9	12	21	

REFERENCES

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