

Summer 2021

Characterization of Oral Cavity and Oropharyngeal Cancer in the Texas Rio Grande Valley

Jared A. Sperling

The University of Texas Rio Grande Valley, jared.sperling01@utrgv.edu

Rachel Giese

The University of Texas Rio Grande Valley

Follow this and additional works at: <https://scholarworks.utrgv.edu/som9331>



Part of the [Clinical Epidemiology Commons](#), [Community Health and Preventive Medicine Commons](#), [Oncology Commons](#), and the [Otolaryngology Commons](#)

Recommended Citation

Sperling, Jared A. and Giese, Rachel, "Characterization of Oral Cavity and Oropharyngeal Cancer in the Texas Rio Grande Valley" (2021). *MEDI 9331 Scholarly Activities Clinical Years*. 49.
<https://scholarworks.utrgv.edu/som9331/49>

This Article is brought to you for free and open access by the School of Medicine at ScholarWorks @ UTRGV. It has been accepted for inclusion in MEDI 9331 Scholarly Activities Clinical Years by an authorized administrator of ScholarWorks @ UTRGV. For more information, please contact justin.white@utrgv.edu, william.flores01@utrgv.edu.

Characterization of Oral Cavity and Oropharyngeal Cancer in the Texas Rio Grande Valley

Jared Sperling, M.S.¹, Rachel Giese, M.D.¹

Abstract

Cancers of the oral cavity (OC) and oropharynx (OP) account for 3% of cancers diagnosed in the United States each year. A primary cause of death among the Hispanic population in the United States is cancer, accounting for 20% of annual mortality. The Rio Grande Valley (RGV) is a medically-underserved area of South Texas with a large Hispanic population facing health disparities. In this study, we examine the incidence and mortality of OC and OP cancer in the RGV. CDC population-level incidence and mortality rate per 100,000 of OC/OP cancer among patients in the RGV counties of Hidalgo and Cameron County between 2014-2018 compared to Texas and national incidence data was used. Starr and Willacy County data was omitted due to case rates below the reporting threshold. Age-adjusted incidence and 95% confidence interval of OC/OP cancer in the RGV from 2014-2018 is 7.3 [6.6, 8.0], as compared to 11.2 [11.0, 11.3] in Texas, and 11.9 [11.8, 12.0] in the United States. Rates of OC/OP cancer among RGV Hispanics was 6.7 [6.0, 7.5] as compared to 6.8 [6.5, 7.1] in Texas and 6.9 [6.8, 7.0] nationally. Mortality rate in these cancers in the RGV is 1.8 [1.5, 2.2] compared to 2.5 [2.4, 2.5] in Texas. OC/OP cancer rates are prevalent in the Rio Grande Valley but there may be an under-reporting of data. Of note, cancer cases could not be separated by subsite (OC vs. OP) due to the method of reporting to the database. The rising rates nationally may pose a larger problem to the RGV due to cancer health disparities and inequities.

Introduction

Cancers of the oral cavity (OC) and oropharynx (OP) account for 3% of cancers diagnosed in the United States each year. Though etiology may differ among subsites, the major risk factors include tobacco and alcohol use, as well as human papillomavirus infection (HPV). Since 1999, the age-adjusted incidence rate for oropharyngeal cancer in the United States has increased from 10.9 per 100,000 (95% CI 10.7 – 11.0) to 11.7 per 100,000 (95% CI 11.6 – 11.8) in 2017⁵. This is in contrast to many other cancers with oncogenesis driven by tobacco and alcohol use, which have largely seen a decrease in incidence due to public health measures and a national decline in tobacco use⁷.

It has been suggested that the OP cancer incidence is specific to anatomic subsites driven by HPV-oncogenesis rather than alcohol and tobacco. Although HPV vaccination rates have risen nationally over the past 10 years, vaccination rates in Texas have been lower by about 10% on average annually than the national average. CDC data also suggests that Hispanic men and women have lower rates of vaccination than non-Hispanic demographics. In 2018, 36.1% of Hispanic adults aged 18-26 received the HPV vaccination, compared to 36.7% of non-Hispanic black adults and 42.1% of non-Hispanic white adults⁸.

The Rio Grande Valley is a medically underserved community and as a region has some of the poorest health disparities in Texas and in the United States. The population is estimated to be 1.4 million, with predominately lower education rates and lower socioeconomic status. According to US Census Data in 2020, the percentage of uninsured population in Hidalgo and Cameron County is 32.1% and 30.2% respectively, compared to the national average of 9.5%.

The RGV also is a predominantly Hispanic community, with greater than 90% of the population identifying as Hispanic/Latinx. Among the Hispanic population, cancer has surpassed cardiovascular disease as the leading cause of death¹. Furthermore, it has been postulated that health disparities and cultural factors may contribute to the mortality of cancers in the Hispanic population¹.

In Texas, the annual incidence of OC/OP cancer has remained stable. Though non-Hispanic white males have the highest incidence of oropharyngeal cancer in Texas, Hispanic males and females are also affected. To date, there has not been a publication on the incidence and prevalence of OC and OP cancer in the South Texas, specifically the RGV Hispanic community, in over 10 years². Given that cancer is a leading cause of mortality in the Hispanic population and that HPV vaccination rates are lower in the RGV, our aim in this study is to describe the current burden of OC and OP cancers in the four-county region of the RGV.

Material and Methods

We analyzed population level data from 2014-2018, which was gathered using the Texas Cancer Registry (TCR) and CDC-Surveillance, Epidemiology, and End Results (SEER). Data was taken for the United States (U.S.), Texas, and the four-county region of the RGV, which includes Hidalgo County and Cameron County. Of note, Starr County and Willacy County were omitted due to case numbers below the threshold for reporting in TCR and SEER. The comparable and geographically-distinct border county of El Paso County was also used to observe any geographical differences.

Incidence rates and mortality rates for OC/OP cancers were analyzed per 100,000 people. The incidence and mortality rates were age-adjusted to the 2000 U.S. standard population, and stratified by gender and race/ethnicity. Race/ethnicities were standardized into the following groups: non-Hispanic white (NHW), non-Hispanic black (NHB), Asian-Pacific Islander (API), American Indian/Alaska Native (AI/AN), and Hispanic. Genders were standardized into male and female gender. Cancer from the OC and OP were analyzed within the database. Of note, cancer subsite within OC and OP could not be separated due to the nature of the data reporting. TCR data was suppressed if fewer than 16 records were reported in a specific area-sex-race category to ensure confidentiality and data integrity. Of note, RGV and individual county data could not be collected for API, NHB or AI/AN due to case counts below the threshold of reporting.

Results

In the RGV, the overall age-adjusted incidence and 95% confidence interval of OC/OP cancer from 2014-2018 is 7.3 [6.6, 8.0], as compared to 11.2 [11.0, 11.3] in Texas, and 11.9 [11.8, 12.0] in the U.S. When stratified by race/ethnicity, rates of OC/OP cancer among RGV Hispanics was 6.7 [6.0, 7.5] as compared to 6.8 [6.5, 7.1] in Texas and 6.9 [6.8, 7.0] nationally. Age-adjusted incidence for RGV NHW was 10.7 [8.5, 13.4], compared to 14.1 [13.8, 14.8] in Texas and 12.3 [12.2, 12.4] in the U.S. When stratified by gender, age-adjusted incidence for RGV males was 10.9 [9.7, 12.3], compared to 17.2 [16.9, 17.6] in Texas and 18.0 [17.9, 18.0] nationally. Age-adjusted incidence for RGV females was 4.3 [3.6, 5.0], compared to 5.8 [5.7, 6.0] in Texas and 6.5 [6.4, 6.5] nationally.

When looking at specific counties, the total age-adjusted incidence of OC/OP cancer was 6.8 [6.6, 7.0] in Hidalgo County, 7.8 [6.7, 9.1] in Cameron County, and 7.2 [6.4, 8.1] in El Paso County. When stratified by race/ethnicity, the age-adjusted incidence rate was 6.6 [5.6, 7.6] for Hispanics in Hidalgo County, 6.9 [5.6, 8.3] in Cameron County, and 6.1 [5.3, 7.1] in El Paso County. In NHW, age-adjusted incidence rate was 9.3 [6.5, 13.2] in Hidalgo County, 12.3 [8.7, 17.3] in Cameron County, and 12.7 [10.1, 15.7] in El Paso County. When stratified by gender, age-adjusted incidence rate was 10.6 [9.0, 12.2] in Hidalgo County, 11.9 [9.8, 14.3] in Cameron County, and 11.7 [10.1, 13.4] in El Paso County. In females, age-adjusted incidence rate was 3.6 [2.9, 4.6] in Hidalgo County, 4.6 [3.5, 6.1] in Cameron County, and 3.8 [3.0, 4.7] in El Paso County.

Mortality rate per 100,000 in OC/OP cancers in the RGV is 1.8 [1.5, 2.2] compared to 2.5 [2.4, 2.5] in Texas. When stratified by race/ethnicity, the mortality rate among Hispanics is 1.7 [1.3, 2.1] and 2.6 [1.5, 4.3] for NHW in the RGV.

Discussion

The RGV is a medically-underserved population facing significant barriers to health care access and health disparities. To date, this is the first study characterizing population-level data for OC/OP cancer in the region. Significant findings and conclusions can be drawn from the data comparison. As a whole, the data suggests that OC/OP cancer burden is lower in the RGV as compared to Texas and the U.S. Interestingly, this is in a sharp contrast to other cancers, including cervical, liver and stomach cancers that are disproportionately higher in the RGV and the Hispanic population⁵. As a whole, trends in differences between males and females, as well as NHW and Hispanic demographics, followed the same trends seen in the U.S. and Texas.

The Hispanic population in the United States has a significantly lower cancer burden in general, but many cancers disproportionately affect this population. Liver cancer has been shown to be among the 5 most common causes of cancer mortality among the Hispanic male population, but does not affect NHW at a significantly high rate. Similarly, stomach cancer mortality is among the top 5 causes of cancer-related deaths among the Hispanic population, yet does not affect NHW at such a high rate³. These two cancers may highlight the different oncogenesis patterns that affect different populations, as these cancers may be driven by infectious processes rather than tobacco and alcohol³. Based on this study, Hispanic RGV OC/OP cancer burden is similar to trends of OC/OP cancer found among the Hispanic population throughout the United States. However, the Hispanic community in Texas continues to grow annually, indicating an increasingly large need to address this public health issue for the population.

Regional and socioeconomic disparities may play a role in cancer incidence and mortality. Studies have shown that rural populations have higher cancer mortality rates and higher incidence rates for cancers with primary and secondary prevention modalities³. In our study, this would include OP cancer, as HPV vaccination has been shown to reduce the incidence HPV-associated OP cancer. One study by Zahnd et al. showed that rural populations had a significantly higher rate of OP cancer than urbans⁴. However, the data from our study suggests that the rural RGV community does not follow this trend.

Several factors may influence the data, which present certain limitations to this characterization. Cancer data may not be accurately reported, which would suggest an underrepresentation of OC/OP cancer in the RGV. Second, the data was not able to be stratified

based on subsite and anatomical location. Future studies should include this data, as it would be able to differentiate between HPV-driven OP cancer in the base of tongue and tonsils and non-HPV associated OC cancers⁶.

Future directions should include further detailed analysis concerning the differences between trends of OC and OP cancer specifically. As the Hispanic population grows, careful consideration of overall trends paired with detailed molecular analysis and improved HPV vaccination efforts should be prioritized to improve health outcomes for this population in the RGV.

Institutional Affiliations

1. Department of Otolaryngology - Head and Neck Surgery, University of Texas Rio Grande Valley School of Medicine, Edinburg, Texas, USA

References

1. Rowan SD, DiBurro M, Westbrook S, Redding SW, Miller FR. Prevalence of HPV associated oropharyngeal cancer among south Texans. *Tex Dent J*. 2014;131(5):376-381.
2. Yanez B, McGinty HL, Buitrago D, Ramirez AG, Penedo FJ. Cancer Outcomes in Hispanics/Latinos in the United States: An Integrative Review and Conceptual Model of Determinants of Health. *J Lat Psychol*. 2016;4(2):114-129. doi:10.1037/lat0000055
3. Zamora SM, Pinheiro PS, Gomez SL, et al. Disaggregating Hispanic American Cancer Mortality Burden by Detailed Ethnicity. *Cancer Epidemiol Biomarkers Prev*. 2019;28(8):1353-1363. doi:10.1158/1055-9965.EPI-18-0872
4. Zahnd WE, Fogleman AJ, Jenkins WD. Rural-Urban Disparities in Stage of Diagnosis Among Cancers With Preventive Opportunities. *Am J Prev Med*. 2018;54(5):688-698. doi:10.1016/j.amepre.2018.01.021
5. Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Incidence - SEER Research Data, 9 Registries, Nov 2020 Sub (1975-2018) - Linked To County Attributes - Time Dependent (1990-2018) Income/Rurality, 1969-2019 Counties, National Cancer Institute, DCCPS, Surveillance Research Program, released April 2021, based on the November 2020 submission.
6. Conway DI, Purkayastha M, Chestnutt IG. The changing epidemiology of oral cancer: definitions, trends, and risk factors. *Br Dent J*. 2018;225(9):867-873. doi:10.1038/sj.bdj.2018.922
7. Gallaway MS, Henley SJ, Steele CB et al. Surveillance for Cancers Associated with Tobacco Use – United States, 2010-2014. *MMWR Surveill Summ* 2018;67(No. SS-12):1-42. doi: <http://dx.doi.org/10.15585/mmwr.ss6712a1>.
8. Boersma P, Black LI. Human Papillomavirus Vaccination Among Adults Aged 18-26, 2013-2018. *NCHS Data Brief*. 2020;(354):1-8.