Trends in Early Stage Hepatocellular Carcinoma, California 1988-2010

Danielle N. Ewing, MPH[1], Cara Torruellas, MD, MPH[2] and Rosemary D. Cress, DrPH[1,3]

[1] Public Health Institute, Cancer Registry of Greater California, Sacramento, CA
[2] University of California Davis Medical Center, Department of Internal Medicine, Division of Gastroenterology and Hepatology, Sacramento CA
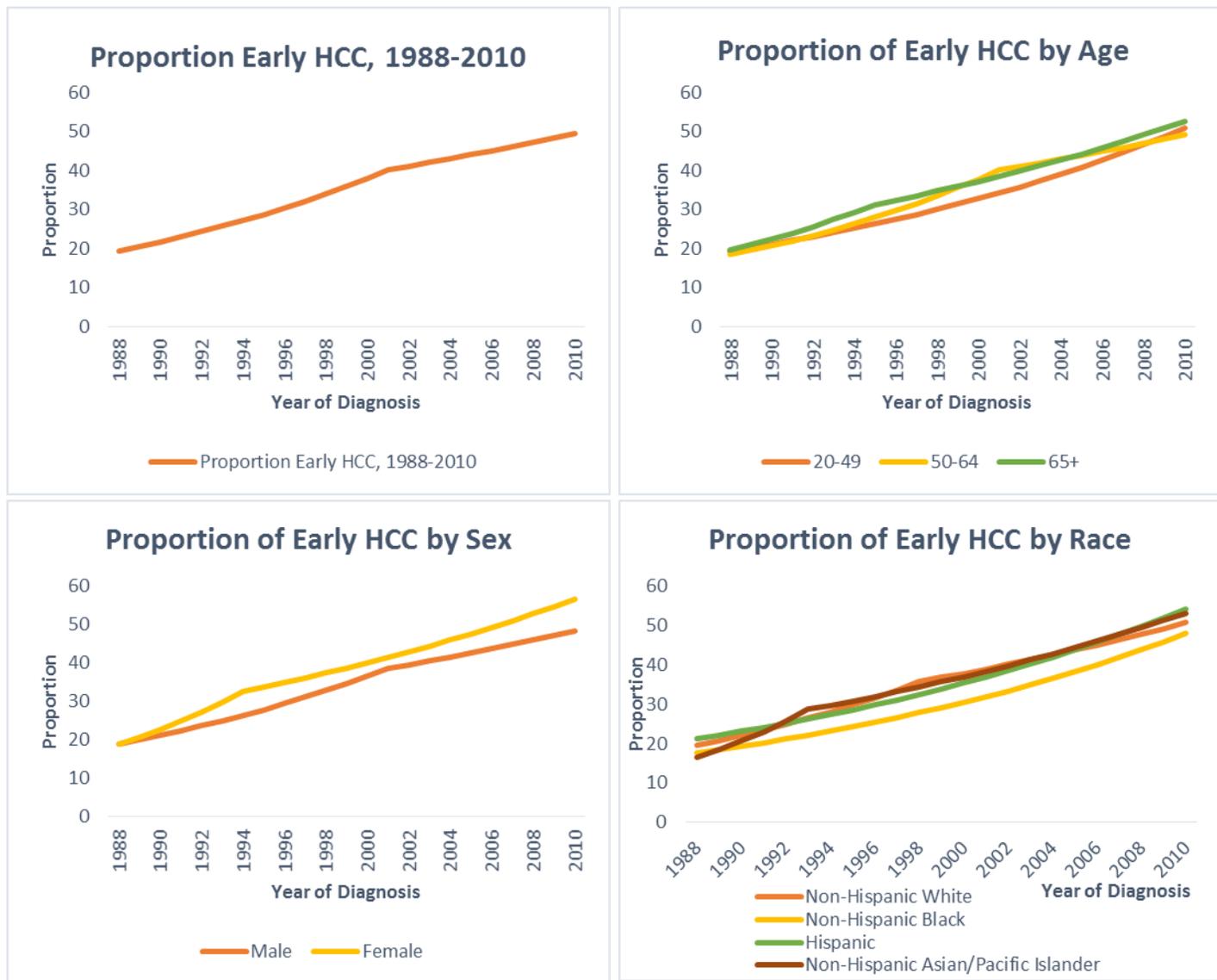[3] Dept. of Public Health Sciences, UC Davis School of Medicine, Davis, CA

Hepatocellular carcinoma (HCC) is the third leading cause of mortality among all cancers worldwide[1][2] and is the most common type of liver cancer[3]. The incidence of HCC in the United States has tripled since the 1980's[4] and HCC is predicted to become the third leading cause of cancer-related death in the U.S. by the year 2030[5]. California was ranked as one of the five states with the highest mortality rates in 2010[6]. While the prognosis of HCC is generally dismal with a 5-year survival of 12% or less, early detection allows treatment by radiofrequency ablation, partial hepatectomy and liver transplantation which are associated with 5-year survival rates of 50%-70%[8]. Thus, early detection and treatment of HCC are paramount to improved patient survival[9]. The purpose of this study was to determine trends in the detection of early HCC in California and survival trends since the implementation of abdominal ultrasound-based HCC surveillance.

Patients with HCC were identified through the California Cancer Registry (CCR). Patients included in this study were males and females, age 20 years old and older, diagnosed with HCC during 1988-2010 according to ICD-O-3 histology codes 8170-8175, and resided in California at the time of their diagnosis. Stage at diagnosis was defined based on SEER summary staging categorized as: localized, regional, distant, and unknown and in this analysis early HCC was defined as localized.

All data were analyzed using SEER*Stat version 8.1.15 and Joinpoint Regression Program version 4.1.0 and a p-value of < 0.05 was considered statistically significant. The primary endpoint in this analysis was the average annual percent change (AAPC) of the proportion of early stage HCC. The AAPC was calculated for age, race, sex, and SES to determine any trends during this time period. A two and five-year cause-specific survival analysis was performed with follow up through 2011. Only individuals with one primary cancer and with the cause of death being liver cancer were used in this analysis. Survival trends were calculated for age, sex, race, SES and stage.

During the years 1988-2010, 35,190 patients were diagnosed with HCC. Of these cases, 13,855 (39%) were localized cancers, or early HCC. The proportion of cases diagnosed with early HCC increased in all age, race, and sex groups between 1988 and 2010. The overall proportion of patients diagnosed with early HCC increased from 19.2% to 49.2% during this

Proportion Early HCC, 1988-2010

— Proportion Early HCC, 1988-2010

Proportion of Early HCC by Age

— 20-49　— 50-64　— 65+

Proportion of Early HCC by Sex

— Male　— Female

Proportion of Early HCC by Race

Non-Hispanic White
Non-Hispanic Black
Hispanic
Non-Hispanic Asian/Pacific Islander

period, with an AAPC of 4.3%. (See Figures Below)

Both the two-year and five-year cause-specific survival analyses showed that survival among HCC patients has been increasing since 1988 across all categories. Two-year survival for all HCC cases increased from 14.5% for patients diagnosed in 1998 to 45.9% for those diagnosed in 2010 with an AAPC of 5.4%. Five-year survival increased from 8.0% to 31.9% for patients' diagnosed 1988-2007 with an AAPC of 7.9%. In all categories the

increase in five-year survival was greater than the increase in two-year survival. Younger patients generally had higher survival rates, but patients 65 years and older had the highest AAPC in both the two and five-year cause-specific survival trends (5.9% and 8.0%, respectively). Non-Hispanic Blacks had the lowest survival rates, but the greatest increase in five-year survival with an AAPC of 20.4%. Although similar, females had overall better survival than males.

Our study found that despite the increasing incidence of HCC, the proportion of patients diagnosed early is continuing to climb, and the overall survival of HCC is improving across all demographics. This increase in survival among patients with HCC may be correlated with the innovation of new treatments and most importantly that patients are being diagnosed at an earlier stage to receive such treatments. Future studies looking at these individual treatments to see which may be having the most impact on survival could help translate the findings in this study. It may be a combination of treatment and diagnosis that is having the most impact on overall survival of patients with HCC. With continued surveillance and improved primary prevention of HCC we can expect to observe declining incidence and mortality in future years.

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