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Somatic mutations in head and neck cancer and racial-ethnic disparities in survival

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Head and neck squamous cell carcinoma (HNSCC) is a devastating illness with divergent racial/ethnic disparities in clinical outcomes. We evaluated the association between somatic mutations and HNSCC survival in a tri-racial/ethnic patient population with over-sampled minorities. Using a retrospective study design, we evaluated 237 mutation sites of 10 genes (i.e., *CDKN2A*, *EGFR*, *FGFR3*, *HRAS*, *KRAS*, *MET*, *NOTCH1*, *PIK3CA*, *STK11*, and *TP53*) in 214 HNSCC patients: 98 Non-Hispanic Whites (NHW; 46%), 72 Hispanic Whites (HW; 34%), and 44 African-Americans (AA; 20%). Using logistic regression models and 2-year survival as the outcome variable, we identified important somatic mutations that are associated with worse clinical outcomes (early death within 2 years) and interactions between race/ethnicity and mutation. HW and AA had higher mutation rates for *EGFR*, *HRAS*, *KRAS*, and *TP53* compared to NHW, and were more likely to have at least 3 mutations as compared to NHW (31% and 18%, respectively vs. 2%; $p < 0.001$). In multivariate analysis, *NOTCH1* mutations were significantly associated with early death in NHW (OR=5.51, 95% CI=[1.22, 24.56]); *TP53* mutations were significantly associated with early death in HW (OR=3.84, 95% CI=[1.08-13.68]). No association was observed in AA. This is the first study evaluating the association between somatic mutations and HNSCC survival in a tri-racial/ethnic population. If confirmed in larger studies, actionable mutations that are associated with HNSCC survival may be targeted using mutation-specific therapy in order to improve overall survival and narrow the racial/ethnic disparity in HNSCC clinical outcomes.

Biography

Evan S Wu is currently an M.D./PhD student at the University of Miami Miller School of Medicine. He holds a B.A. in Statistics from the University of California, Berkeley, and is pursuing his PhD in the Biostatistics Department. His clinical interest is in medical oncology, and plans to pursue an investigator pathway residency program in the future.

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