UC San Diego
MOORES CANCER CENTER

2018 Glieberman Head and Neck Cancer Center Pilot Grant

Generalized Competing Event (GCE) Modeling to Identify Head and Neck Cancer Patients Likely to Benefit from Treatment Intensification

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Scientific Abstract:

Multiple studies have found that competing health events are a prevalent and increasingly relevant problem in patients with head and neck cancer (HNC). Competing events are of importance in oncology because they complicate the interpretation of effects on primary survival endpoints. Better methods to stratify patients according to competing event risk are needed to tailor intensity of therapy to individual patients. In particular, there is controversy as to whether HNC patients who are elderly and/or have comorbidities, and those with human papilloma virus (HPV)-associated HNC benefit from treatment intensification with multi- modality therapy, and whether less toxic strategies would be more effective.
Traditionally, risk-stratification models have focused on the effects of treatments and risk factors on combined endpoints, such as overall survival and/or event-free survival and are therefore unable to isolate effects on primary versus competing events. In contrast, generalized competing event (GCE) models stratify populations according to the hazard for cause-specific events relative to the hazard for competing events (also called the ω ratio) and thus may be useful to identify patients with the greatest potential to benefit from intensified cancer treatment. In this proposal, we will refine and validate a model to predict HNC patients' ω ratio. We will first use data from two meta-analyses (MARCH and MACH-NC) to refine the GCE nomogram and test it in a population of VA patients using the VINCI data set, to determine whether the effect of intensive treatment varies with the ω ratio.

Lay Abstract:

Head and neck cancer (HNC) is a common disease that often is diagnosed after having spread to lymph nodes in the neck. These cancers are usually curable, but treatment often requires an intensive combination of chemotherapy, radiation therapy (RT) and surgery. Previous studies have found that more intensive treatment can improve survival and reduce cancer recurrence. But these intensified treatment programs come at the cost of increased short- and long-term side effects.
Previous research has shown that some patients, such as the elderly, do not benefit from more aggressive treatment, because improvements in cancer control are often negated by patients' risk of dying from other non-cancer causes. Being able to predict a patient's relative risk of dying from cancer versus non-cancer causes can determine how much they would likely benefit from more aggressive treatment. Such methods of assessment could direct the use of more aggressive therapies to those most likely to benefit.
Unfortunately, traditional methods of determining risk, such as staging systems, do not adequately take into account the relative risk of dying from cancer versus alternative causes of mortality. Our group has developed better statistical methods to improve prediction of the relative risks for HNC patients. We are

planning to use data from clinical trials and the VA hospitals to validate this theory and make the prediction model more accurate.