Identifying Predictors of Anal HPV Status in HPV-Vaccinated MSM: A Machine Learning Approach

Abstract
Anal human papillomavirus (HPV) infection has a high prevalence in men who have sex with men (MSM), resulting in an increased risk for anal cancer. This work aims to identify factors associated with HPV in a prospective cohort of HPV-vaccinated MSM. This observational study enrolled MSM patients admitted to an Italian sexually transmitted infection (STI) AIDS Unit. Two random forest (RF) algorithms were applied to evaluate predictors that were most associated with HPV. The cohort included 135 MSM, 49% of whom were HIV-positive with a median age of 39 years. In model 1 (baseline), age, age sexual debut, HIV, number of lifetime sex partners, STIs, were most associated with the HPV. In model 2 (follow-up), age, age sexual debut, HIV, STI class, and follow-up. Traditional risk factors for anal HPV infection, such as drug use, receptive anal intercourse, and multiple sexual partner, were found to have low importance in predicting HPV status.