Determining the Efficacy of the Gardasil-9 Vaccine in HIV-Positive Individuals

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Objectives

- Conduct the study on a diverse population of non-vaccinated, partially vaccinated, and fully vaccinated against HPV
- Determine specific HPV genotypes found in anogenital tract of HIV infected people positive with HPV

Background/Intro

High-risk oncogenic Human papillomaviruses (HPV) cause the majority of anal and cervical cancer [3]. Most often, persistent HPV infections can lead to pre-cancerous lesions, such as low or high-grade dysplasia that can morph into cancer over time (Figure 1) [2,4]. Gardasil 9 is an effective vaccine in preventing HPV-related diseases [1]. Most studies regarding vaccine efficacy of Gardasil 9 have centered around immunocompetent individuals. Some studies have been done to determine the effectiveness of the HPV vaccine in HIV-positive individuals, most often showing an antibody response for previously vaccinated individuals [5,6] but there are few studies done that observe this response in a diverse background of individuals before and after receiving the Gardasil-9 vaccine.

Factors

- Gender
- Race
- HPV positive

Table 1: Listed Demographics of the total individuals that have been tested for HPV, broken down by age, race, gender, HPV positive/negative, and outside factors. A chi-squared test was used to test statistical significance between HPV-positive and HPV-negative tested individuals - the p-values from the test are listed. The only statistical significance found was from alcohol consumption between the two prospective cohorts.

We hypothesize that the previously vaccinated cohort will have lower rates of HPV positivity than the previously unvaccinated/partially vaccinated cohort.

Results

Population Characteristics

- Sample size is 50
- HPV positivity between unvaccinated and vaccinated prior to enrollment showed no statistical significance
- Alcohol consumption in unvaccinated and vaccinated cohorts showed statistical significance
- The majority of the sample population was: Black/African American Men

Table 2: A dual primer PCR was completed on the extracted swab DNA from the anal and vaginal region. MY09/MY11, a degenerate primer set, was utilized to detect various HPV genotypes from the selected Genomic DNA. A β-globin primer set, PC04/GH20, was used to make sure human DNA was present.

Future Directions

- This study will continue to progress with the extraction and testing of the rest of the swab samples
- HPV positive samples will be sent for genotyping through My-Seq Platform
- A comparison will likely be done with non-immune deficient population data to note any discrepancies

References


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Methods

PCR

Gel Electrophoresis

Table 3. Gel Electrophoresis was utilized to separate the DNA fragments from the dual primer PCR. Negative and positive controls were also run under the same analysis with the cohort samples to ensure quality of the results.

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