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African-American Women May Benefit Less From Current HPV Vaccines for Cervical Cancer Prevention

NATIONAL HARBOR, Md. — African-American and non-Hispanic white women who had an abnormal Pap test were found to be infected with different cervical cancer-causing human papillomavirus (HPV) subtypes, and the currently available HPV vaccines do not protect against infection with the subtypes most frequently detected in African-American women, according to results presented here at the 12th Annual AACR International Conference on Frontiers in Cancer Prevention Research, held Oct. 27–30.

"Although our findings need to be replicated in larger cohorts of women, they suggest that the currently available HPV vaccines, which target HPV subtypes 16 and 18 in order to prevent cervical cancer and precancerous cervical abnormalities, will be less beneficial for African-American women than non-Hispanic white women," said Cathrine Hoyo, Ph.D., M.P.H., associate professor in the Obstetrics and Gynecology Department at Duke University School of Medicine in Durham, N.C.

Cervical cancer begins as precancerous cervical abnormalities called cervical intraepithelial neoplasia (CIN). Most, if not all, cervical cancers are caused by persistent infection with certain subtypes of HPV, most commonly HPV 16 and 18.

"African-American women are about 20 percent more likely to develop cervical cancer and almost twice as likely to die from the disease compared with non-Hispanic white women," said Hoyo. "We found a much lower prevalence of HPV 16 and 18 in advanced CIN [CIN2 and 3] from African-American women. Rather, their CIN2 and 3 frequently harbored HPV 31, 35, 45, 56, 58, 66, and 68, all of which are linked to cervical cancer."

A vaccine that targets nine HPV subtypes (6, 11, 16, 18, 31, 33, 45, 52, and 58) is currently being tested in phase III clinical trials. According to Hoyo, this vaccine may be more beneficial to African-American women than the two FDA-approved HPV vaccines because it is designed to target three of the cervical cancer-associated HPV subtypes identified by her team to be prevalent in African-American women with CIN2 and 3: HPV 31, 45, and 58.

"However, the vaccine does not include HPV 35, 66, and 68," she added. "We need more African-American women to enroll in trials like this to see how beneficial this new vaccine will be for them," she added.

Hoyo and colleagues are enrolling women who are undergoing a colposcopy following an abnormal Pap test in the Cervical Intraepithelial Neoplasia Cohort Study (CINCS) in an effort to identify markers that distinguish early CIN (CIN1) from advanced CIN (CIN2 and 3). As part of the study, they have evaluated the HPV subtypes present in the CIN from 572 participants in CINCS, including 280 African-American women and 292 non-Hispanic white women.

The researchers found that HPV 16, 18, 31, 56, 39, and 66 were the most frequently detected HPV subtypes among the 127 non-Hispanic white women with CIN1, whereas HPV 33, 35, 58, and 68 were most common among the 112 African-American women with CIN1. Restricting analysis to the 88 women with CIN2 or 3 revealed that HPV subtypes 16, 18, 33, 39, and 59 were most common for the 47 non-Hispanic white women, while HPV 31, 35, 45, 56, 58, 66, and 68 were the most prevalent HPV subtypes among the 41 African-American women.

This study was funded by the National Institutes of Health and National Cancer Institute. Hoyo has declared no conflicts of interest.

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Presenter: Cathrine Hoyo, Ph.D., M.P.H.

Title: HPV genotype distribution and cervical intraepithelial neoplasia in African American and White women living in the Southeastern United States

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Background: Differential distributions of oncogenic HPV genotypes among racial/ethnic groups may explain observed disparities in ICC incidence and mortality rates. We describe HPV genotypes associated with CIN1-3 in a multiethnic cohort of women visiting colposcopy clinic following a cervical abnormality.

Methods: We enrolled 516 women attending colposcopic evaluation following an abnormal liquid-based cytology screen. HPV infection was measured using HPV linear array that measures 37 HPV types, and chi-squared tests were used to compare HPV genotypes in African American and Whites overall, and by CIN stage.

Results: Of 516 participants, 373 (72%) were HPV-positive; 137 (37%) had no CIN lesion, 174 (47%) had CIN1, 38 (10%) had CIN2, and 24 (6%) had CIN-3. Twenty-seven percent of women were infected with one HPV genotype, and 73% were infected with multiple HPV genotypes. In women with CIN1, 75% of HPV single infections were of high risk (HR) genotypes, and 70% of women had multiple HR-HPV genotype infections. The most frequent HR-HPV genotypes detected among CIN1 cases were 16, 18, 31, 45, 52, 56, 59 and 66 in White women, while HPV subtypes 33, 35, 58 and 68 were the most common in African American women. Restricting analyses to women with CIN2-3 revealed a change in HR-HPV genotype distribution; HR-HPV 16, 18, 33, 35, 39, and 59 were most common in White women with CIN2-3, whereas HR-HPV 31, 45, 51 and 66 were the most prevalent in African American women.

Conclusion: Our data suggest that while HPV 16 and 18 are the most common genotypes among women with CIN in Whites; African Americans may harbor different genotypes. The preponderance of non-16/18 HR-HPV genotypes in African Americans with increasing CIN grade has implications for both reflex testing following cytological abnormalities and vaccine development.