Sun exposure and cutaneous HPV infection found synergistic in skin cancers

June 25 2012

Researchers at Moffitt Cancer Center and colleagues at the University of South Florida and the German Cancer Research Center in Heidelberg have found that having antibodies for cutaneous types of human papillomavirus (HPV), coupled with sun exposure (ultraviolet radiation) or poor tanning ability, can act "synergistically" in the development of non-melanoma skin cancers such as basal cell carcinoma (BCC) and squamous cell carcinoma (SCC).

A number of studies into the relationship between cutaneous HPV and sun exposure have been conducted previously but with mixed results, the researchers said.

This study, the first to investigate interaction effects between genus-specific cutaneous HPV positivity and multiple measures of sunlight exposure as related to BCC and SCC in a U.S. population, was published in a recent issue of The *Journal of Infectious Diseases*.

"UV radiation exposure is the most important risk factor for the development of non-melanoma skins cancer," said study lead author Dana E. Rollison, Ph.D., Moffitt associate member, vice president and chief health information officer. "Cases of non-melanoma skin cancers are increasing despite the increased use of sunscreen products. Thus, so that new interventions can be developed, there is a need to identify co-factors that may interact with UV radiation exposure in increasing the skin cancer risk."

According to the authors, the risk factors for basal cell and squamous cell carcinomas are male sex; age; light skin, eyes and hair; and UV radiation exposure.

UV radiation exposure and light skin pigmentation are the most recognized risk factors. People with low melanin production tend to have difficulty tanning when exposed to UV radiation.

Skin pigmentation, created by chemical melanin production in the skin, is the "main photoprotective mechanism in the skin," noted the researchers.

The researchers hypothesized that persistent HPV infection may promote tumor progression by interfering with an individual's response to UV radiation-induced DNA damage and that HPV plays a synergistic role in the development of BCC and SCC. Accordingly, their goal was to investigate the potential "modifying effects of cutaneous HPV seroreactivity on the associations between sunlight exposure, host susceptibility to UV radiation exposure, and both BCC and SCC."

The study recruited 204 patient volunteers with BCC, 156 with SCC, and 297 controls with no reported cancer types. The three groups were surveyed on demographics, personal constitutional characteristics, lifestyle factors and measurements of sunlight exposure. Each volunteer provided a blood sample for cutaneous HPV antibody measurement.

"Sun-related factors were associated with BCC and SCC," Rollison said. "Cutaneous sensitivity to sunlight exposure - specifically experiencing a blistering sunburn - and poor tanning ability were associated with a higher prevalence of antibodies to cutaneous HPV types in genus beta. The associations between poor tanning ability and SCC were significantly greater among those positive for antibodies to cutaneous HPV types in genera alpha and beta."

Additional studies are needed, including those measuring infection with cutaneous HPV types in multiple genera, concluded the researchers.

"Identifying how HPV infections might influence sunlight-associated risks of NMSC may lead to improved identification of high-risk individuals and also aid in the development of new prevention strategies," Rollison said.

Provided by H. Lee Moffitt Cancer Center & Research Institute