

Virus, Vaccines and Cervical Cancer

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Objectives

The lecture will present the mainstream background knowledge regarding this subject and an updated review will be presented demonstrating the scientific evidence to some new research proposals in the field.

Summary

HPVs are a heterogeneous group of double-stranded, nonenveloped DNA viruses. Most of the oncogenic HPV types are phylogenetically related to either HPV-16 (31, 33, 35, 52 and 58) or HPV-18 (39, 45, 59 and 68). Therefore, controlling HPV infection may be the key to eradicating cervical cancer. Recent reports demonstrate that through HPV vaccination a promising prevention may be effective toward a reduction of the global burden of cervical cancer. A prophylactic HPV-16 vaccine programme may be effective in the prevention of cervical cancer in a significant number of women from European population. Furthermore, it remains to understand the role of the genetic background in cancer susceptibility of a viral associated neoplasia.

Recommended reading

- 1) A papillomavirus DNA from a cervical carcinoma and its prevalence in cancer biopsy samples from different geographic regions. Matthias Durst, Lutz Gissmann, Hans Ikenberg, and Harald zur Hausen. **Proc. Natl Acad. Sci. USA**; Vol. 80, pp. 3812-3815, June 1983
- 2) Effect of screening on incidence of and mortality from cancer of cervix in England: evaluation based on routinely collected statistics. Mike Quinn, Penny Babb, Jennifer Jones and Elizabeth Allen. **BMJ** 1999;318;904
- 3) Infectious agents and cancer: criteria for a causal relation. Joseph S. Pagano, Martin Blaser, Marie-Annick Buendia, Blossom Damania, Kamel Khalili, Nancy Raab-Traub, Bernard Roizman. **Seminars in Cancer Biology** 14 (2004) 453–471
- 4) The influence of smoking and other cofactors on the time to onset to cervical cancer in a southern European population. A Matos, J Moutinho, D Pinto, and R Medeiros. **European Journal of Cancer Prevention** 2005, 14:485–491
- 5) Characterization of HPV genotype profile in squamous cervical lesions in Portugal, a southern European population at high risk of cervical cancer. R Medeiros, H Prazeres, D Pinto, I Macedo-Pinto, M Lacerda, C Lopes, and E Cruz. **European Journal of Cancer Prevention** 2005, 14:467–471
- 6) High sustained efficacy of a prophylactic quadrivalent human papillomavirus types 6/11/16/18 L1 virus-like particle vaccine through 5 years of follow-up. LL Villa et al. **British Journal of Cancer** (2006) 95, 1459 – 1466
- 7) Genital human papilloma virus infection in mentally-institutionalized virgins. Takako Shimada, Masako Miyashita, Shoko Miura, Daisuke Nakayama, Kiyonori Miura, Masafumi Fukuda, Hideaki Masuzaki. **Gynecol Oncol.** 2007 Sep;106(3):488-9
- 8) Cervical cancer screening following prophylactic human papillomavirus vaccination. Eduardo L. Franca, Jack Cuzick. **Vaccine** (2008) 26S, A16—A23
- 9) Distinct Risk Factor Profiles for Human Papillomavirus Type 16 – Positive and Human Papillomavirus Type 16 – Negative Head and Neck Cancers. Maura L. Gillison, Gypsyamber D'Souza, William Westra, Elizabeth Sugar, Weihong Xiao, Shahnaz Begum, Raphael Viscidi. **J Natl Cancer Inst** 2008;100: 407 – 420

Recommended reading for the small group tutorial session:

- 1) Age-Related Changes of the Cervix Influence Human Papillomavirus Type Distribution. Philip E. Castle et al. **Cancer Res** 2006; 66: (2)
- 2) Human Papillomavirus DNA versus Papanicolaou Screening Tests for Cervical Cancer. Marie-Hélène Mayrand et al. **N Engl J Med** 2007;357:1579-88
- 3) Predicting High-Risk Human Papillomavirus Infection, Progression of Cervical Intraepithelial Neoplasia, and Prognosis of Cervical Cancer With a Panel of 13 Biomarkers Tested in Multivariate Modeling. Margherita Branca et al. **International Journal of Gynecological Pathology** 2008; 27:265–273
- 4) Human Papillomavirus Genotype Specificity of Hybrid Capture. Philip E. Castle, Diane Solomon, Cosette M. Wheeler, Patti E. Gravitt, Sholom Wacholder, and Mark Schiffman. **JOURNAL OF CLINICAL MICROBIOLOGY**, Aug. 2008, p. 2595–2604 Vol. 46, No. 8
- 5) Are Adjunctive Markers Useful in Routine Cervical Cancer Screening? Application of p16INK4a and HPV-PCR on ThinPrep Samples With Histological Follow-Up. D. Schledermann, B. T. Andersen, K. Bisgaard, M. Dohse, D. Ejersbo, B. Hoelund, P. Horal, M. Lindh, and W. Ryd. **Diagn. Cytopathol.** 2008;36:453–459
- 6) Comparison of Predictors for High-Grade Cervical Intraepithelial Neoplasia in Women with Abnormal Smears. Anne Szarewski et al. **Cancer Epidemiol Biomarkers Prev** 2008;17(11): 3033-3042