Symposium

Recent advances in the diagnosis of HPV infection

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Human papillomaviruses (HPV) are a group of remarkably diverse DNA viruses from the Papillomaviridae family, which are causally involved in the etiology of various benign and malignant neoplastic lesions of mucosal and skin epithelium. Approximately 40 different HPV types from the alpha genus are known to infect mucosal epithelium, with a subset of 10-12 HPV types being associated with lesions that can progress to cancer. These cancer-associated HPVs are designated as high-risk HPV types (hr-HPV) and are the etiological agents of virtually all cervical carcinomas and play the leading etiological role in the development of anal cancer and a substantial proportion of vaginal, penile, vulvar and oropharyngeal (mainly tonsillar) cancers. In view of the fact that persistent infection with hr-HPVs is a necessary etiological factor in the development of cervical carcinoma, HPV testing has become an important part of cervical carcinoma screening and detection algorithms in several countries. Testing for hr-HPVs has four main clinical applications: (i) triage of women with ASC-US or other borderline cytology, (ii) follow-up of women with abnormal screening cytology results who are negative at initial colposcopy/biopsy, (iii) prediction of the outcome after treatment of CIN2+ and (iv) primary screening of women aged 30 years and more in combination with Pap smear. Currently more than 80 different commercial assays for the detection of alpha HPVs are available (reviewed in Poljak M, Kocjan BJ. Exp Rev Anti Infect Ther 2010;8:1139-62) and can be provisory divided into five main groups: (i) DNA-based screening assays, which test for the presence of 13-14 hr-HPVs without determination of HPV type; (ii) assays that combine testing for 14 hr-HPVs and HPV-16 and HPV-18 genotyping; (iii) HPV DNA based genotyping assays, (iv) mRNA hr-HPV assays and (v) in situ hybridization HPV assays. The vast majority of HPV assays currently on the market are not useful for the established clinical applications and especially not for primary screening. Automation, price reduction and improvement of clinical specificity are the main goals for the future development of HPV assays.