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Cervical Cancer and HPV: Dilemmas and Resolution via Biomarkers

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Abstract

Recent research reports are cooling the initial enthusiasm about HPV and cervical cancer. It has been expected since the understanding the HPV is cancer growth promoting agent and only indirectly (persistent infection) cancerogenic agent. This old/new view is expanding the value of HPV immunization (prevention of invasive cancer growth) and is

Creating a new emphasis on HPV disease detection in healthy and patients with invasive cervical cancers.

However, this emphasis is not to HPV infection detection, but to HPV disease detection.

We like to remind our audience to the fact that HPV is highly contagious but weekly virulent agent, meaning that it can be present in many cases but is causing chronic or persistent disease only in few. It perfectly fits with epidemiological data. But it fits with cytopathological data, too.

HPV is found in almost all invasive cervical cancers, but few HPV positive women develop cervical cancer. However, this relation is much more statically relevant in LSIL category where HPV disease is demonstrated as koilocytosis. HPV disease is diagnosed by morphological appearance of warts and cytopathological appearance of special cells – koilocytes. It is then clear that presence of koilocytes mean worse prognosis for the patients who has HPV disease positive signs together with DNA alteration positive signs – diagnosis of LSIL.

A composite biomarker, MEDYKO (FASEB 2016, v. 30, No. 1, Suppl. 696.5), contains a metabolic marker CAP which identifies abnormal cells on Pap smears that may proceed into cervical cancer. As metabolic markers appear before morphology, the presence of CAP (cervical acid phosphatase) in epithelial cells on Pap smears are signs even earlier than morphological DNA changes, and could easily be a usable alarm of pending cervical dysplasia. Thus, CAP may widen the region of morphologically suspicious Pap test slides to categories ASC-US, BCC and RCC; hence, to reduce the inevitable false negative rates of the Pap smear morphology.

In conclusion, a combination of three biomarkers, all visible under the microscope, CAP, HPV and DNA could improve the Pap testing making it more accurate – sensitivity increased by CAP; specificity by HPV; faster – only one quality smear is needed, and for lower cost – all three parameters are visible on the same smear. Additional advantage is amenability of those images for digital image analysis and for electronic

transfer enabling mobile telemedicine based mass cervical cancer screening globally.

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