HPV oligonucleotide microarray for diagnosis of cervical neoplastic lesions

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Background Hybrid Capture II system (HC II) for HPV testing is an useful assay for detecting 13 high risk types of HPV in a clinical setting. In this study, we try to evaluate the HPV oligonucleotide microarray system (HPV DNA Chip) by comparing with HC II and to assess the usefulness of HPV typing for predicting cervical lesions.

Methods This study enrolled 153 women aged 22 and 68 years (mean age; 38.9). Patients were classified into four groups: chronic cervicitis and reactive change (group I; n=62), koilocytotic atypia and mild dysplasia (group II; n=40), moderate and severe dysplasia, CIS (group III; n=40), and invasive cervical cancer (group IV; n=11). All patients had cervical scrapes collected for HPV detection followed by colposcopy and biopsy. Samples were analyzed by HC II and HPV DNA Chip. HPV DNA Chip could detect the thirteen high-risk HPV types (HPV-16/-18/-31/-33/-35/-39/-45/-51/-52/-56/-58/-59/-66) and six low-risk HPV types (HPV-6/-11/-34/-30/-42/-44/-61).

Results HC II offers 95.6% sensitivity and 50% specificity for the diagnosis above mild dysplasia. In HPV DNA Chip, it provides a sensitivity of 94.5% and specificity of 50%. Three cases showed discrepancy between those of two methods. Two cases were positive by HC II and negative by HPV DNA Chip. One case which was negative by HC II was confirmed as HPV-18 by sequencing and HPV DNA Chip. Positive rates by HC II were very high in group I (50%) and group II (92.5%). By the multiple logistic regression analysis, 68.7% of total variation in histopathology was explained by Pap smear and 68.8% of total variation in four groups was explained by Pap smear and HC II. Using HPV DNA Chip, HPV-16 (OR= 8.869; 95% CI=4.14-19.0) and HPV-58 (OR=6.298; CI=1.93-20.6) were related to histopathology. Pap smear and HPV DNA Chip explained the 70.4% of total variation in histopathology.

Conclusions HPV detection by HPV DNA Chip displays a comparable sensitivity with HC II. Furthermore, the use of HPV DNA Chip would provide the benefit in HPV genotyping in cervical neoplastic lesions.