

Detection Rate of High-Grade Cervical Neoplasia and Cost-Effectiveness of High-Risk Human Papillomavirus Genotyping with Reflex Liquid-based Cytology in Cervical Cancer Screening

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Abstract

Introduction: This study aimed to determine the prevalence of cervical intraepithelial neoplasia grade 3 or worse (\geq CIN3) and cost-effectiveness of human papillomavirus (HPV) genotyping with reflex liquid-based cytology (LBC) for cervical cancer screening in Singapore. **Materials and Methods:** Women who were \geq 25 years old and undertook co-testing with LBC and HPV-genotyping (Cobas-4800, Roche, USA) for HPV-16, HPV-18 and 12 high-risk HPV types in a single institution were studied retrospectively. A single cervical smear in ThinPrep® PreservCyt® solution (Hologic, USA) was separated for tests in independent cytology and molecular pathology laboratories. The results were reviewed by a designated gynaecologist according to institutional clinical management protocols. Those who tested positive for HPV-16 and/or HPV-18 (regardless of cytology results), cytology showing low-grade squamous intraepithelial lesions (LSIL) or high-grade SIL (HSIL), or atypical squamous cells of undetermined significance (ASCUS) with positive 12 high-risk HPV types were referred for colposcopy. Colposcopy was performed by experienced colposcopists. Cervical biopsy, either directed punch biopsies or excisional biopsy, was determined by a colposcopist. The diagnosis of \geq CIN3 was reviewed by a gynaecologic pathologist. Cost-effectiveness of HPV-based screening in terms of disease and financial burden was analysed using epidemiological, clinical and financial input data from Singapore. **Results:** Of 1866 women studied, 167 (8.9%) had abnormal cytology (\geq ASCUS) and 171 (9.2%) tested positive for high-risk HPV. Twenty-three CIN were detected. Three of the 10 \geq CIN3 cases had negative cytology but positive HPV-16. Compared to cytology, HPV genotyping detected more \geq CIN3 (OR: 1.43). HPV+16/18 genotyping with reflex LBC was superior in terms of cost-effectiveness to LBC with reflex HPV, both for disease detection rate and cost per case of \geq CIN2 detected. **Conclusion:** Compared to cytology, HPV+16/18 genotyping with reflex LBC detected more \geq CIN3 and was cost-effective for cervical screening in Singapore.

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Key words: Co-Testing, Incidence trend, Mortality, Intraepithelial neoplasia, Pap smear

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