

Demonstration Study of Appropriate Cervical Cancer Screening Strategies in China: A Population-based Nationwide Multi-center Randomized Trial

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Background: hrHPV testing and high-quality cytology have been demonstrated as effective screening methods by studies with strict quality control. However, many factors would affect the actual screening effectiveness in real world. Our study aimed to evaluate the clinical yields of different screening strategies under the circumstances of Chinese local medical resources by a nationwide multi-center individual-randomized trial.

Methods: In rural areas, 33,594 women aged 35-64 were randomly assigned to hrHPV, cytology or VIA/VILI screening, and those with positive hrHPV were randomly triaged by VIA/VILI, cytology or colposcopy. In urban areas, 24,077 women were randomly assigned to hrHPV or cytology screening. HPV16/18 positive women were referred to colposcopy while those with other hrHPV positive were allocated to cytology triage or no triage groups. Women with abnormal screening or triage results underwent colposcopy and directed biopsies. All of diagnoses were performed by county-level physicians.

Results: In rural areas, hrHPV testing without triage had the highest referral rate (12.8%) and CIN2+ detection rate (0.7%). Although the referral rate was significantly higher in VIA/VILI arm (11.9%) than in cytology arm (4.0%), the CIN2+ detection rates were no statistical differences between them (0.5% vs. 0.3%). Compared with no triage, the referral rates decreased by 85% and 80% using cytology or VIA/VILI as a triage method for HPV positive women respectively, but about half of CIN2+ were lost. In urban areas, the referral rate and CIN2+ detection rate in the arm of hrHPV without triage (9.4%, 1.0%) were higher than in cytology arm (6.3%, 0.5%). The strategy of colposcopy for HPV16/18 positive and cytology triage for other hrHPV positive decreased the referral rate by 51% compared with no triage, but CIN2+ detection rate dropped to 0.6%.

Conclusions: Novel objective biomarkers and training programs to improve quality of cytology and VIA/VILI are required to triage hrHPV positive women.

Keywords: Cervical cancer; Screening; Human papillomavirus testing; Triage; Cytology, Visual inspection; Real-world settings