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Early detection of cervical cancer in low-income settings: Single-visit screening combining visual inspection and Pap smear as a sensitive and cost-effective strategy

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Visual inspection with acetic acid (VIA) and Pap smear are economic and effective screening methods for cervical cancer and the sensitivity can be increased if performed together. However, these two methods cannot be completed on the same day because technically one interferes with the other. When screening for cervical cancer in low-income rural communities, distances and poor transportation, together with low willingness, make recalls for a second visit difficult or impossible, leading to lost follow-up. We therefore modified Pap smearing by taking cervical mucus cells using a cotton stick (other than scraping the cervix with a spatula) before VIA and VILI inspection. The modification allowed simultaneous applications of both VIA and Pap test (VIA+Pap) within 2 hours, making biopsying feasible on the same day. We then tested feasibility of the single-visit strategy by screening 1,967 women (30-59 year-olds, of whom 92.3% lived on or below US$1.00 per day) in a low-income setting in far western China. In detecting CIN2/CIN3/cervical cancer, the modified Pap test alone reached a sensitivity of 75.0% (95% CI, 60.9-89.1) and a specificity of 76.6% (95% CI, 70.3-82.9). However, when the Pap test was combined with VIA inspection, the sensitivity was increased to 97.2% (95% CI, 90-100), better than liquid-based cytology and similar to HPV test. This single-visit strategy with simultaneous VIA+Pap screening avoided lost follow-ups and revealed extremely high prevalence (1/100,000) for CIN1 (2,950), CIN2+3 (1,480), and cervical cancer (407) in this low-income setting. Given the high sensitivity of combined VIA+Pap screening with a low cost (locally $4.50/visit), the single-visit screening strategy using VIA+Pap has an excellent cost-effectiveness, which alleviates lost follow-ups and serve as a useful screening strategy for cervical cancer in low-income settings in developing countries/regions such as China, India, southeast Asia and sub-Saharan Africa. (IERB No. SHZ2008LL01, Funding: Chinese Ministry of Science and Technology, Nos. 2009BAI82B02, 2009BAI82B03, 2010DFB34100)

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