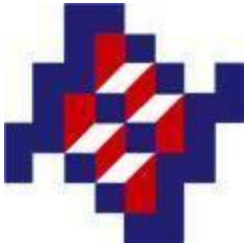


INSTITUTO NACIONAL DE
SALUD PÚBLICA

Center for Population Health Research

October, 2012

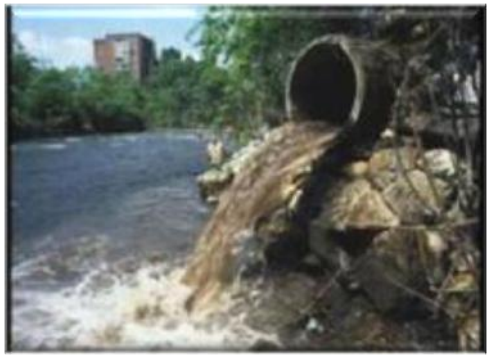
Center for Population Health Research

- Cancer
- **Tobacco Control**
- Reproductive health
- Environmental Health
- Diabetes Mellitus

Laboratories

- **Tobacco compounds**
- **Human Papillomavirus**

Strategic areas for research and action



Innovation in public policy for Cancer Prevention

- *Cervical cancer*
- *Breast cancer*
- *Tobacco control*

Preventive interventions

- Reproductive Health

Training for obstetric and neonatal emergencies in Mexico (PRONTO)

Knowledge generation in Health and Environment

- ✓ *Children and environment*
- ✓ *Populations at environmental risk*
- ✓ *Gene-environment interactions*
- ✓ *Ecosystems and health*

Large epidemiological studies

Diabetes and Cardiovascular Risk

- *Mexican Teachers' Cohort Study, 2006*
- *116,618 female teachers*
- *5000 in the clinical subcohort*

Impact on public policy

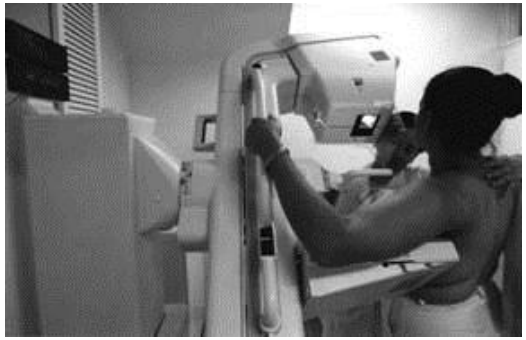
Self-sampling for HPV testing

Accident prevention

HPV vaccines

Tobacco control

Breast cancer



Promotion of the use of better stoves, in rural areas

New detection alternatives for cervical cancer screening:

Increase in coverage, acceptability and safety

THE LANCET

November 2011

Self-collection of vaginal specimens for human papillomavirus testing in cervical cancer prevention (MARCH): a community-based randomised controlled trial

Eduardo Lazcano-Ponce*, Attila Tibor Lorincz*, Aurelio Cruz-Valdez, Jorge Salmerón, Patricia Uribe, Eduardo Velasco-Mondragón, Pilar Hernandez Nevarez, Rodrigo Diaz Acosta, Mauricio Hernández-Avila

Comparison of the effect of HPV sample self-collected at home vs Pap in Mexican rural areas. The March Study

Self-collection of vaginal specimens for human papillomavirus testing in cervical cancer prevention (MARCH): a community-based randomised controlled trial

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Summary

Background Vaginal self-sampling for human papillomavirus (HPV) DNA testing could increase rates of screening participation. In clinic-based settings, vaginal HPV testing is at least as sensitive as cytology for detecting cervical intraepithelial neoplasia (CIN) grade 2 or worse; however, effectiveness in home settings is unknown. We aimed to establish the relative sensitivity and positive predictive value for HPV screening of vaginal samples self-collected at home as compared with clinic-based cervical cytology.

Methods We did a community-based, randomised equivalence trial in Mexican women of low socioeconomic status aged 25–65 years. Participants came from 540 medically underserved, predominantly rural communities in Morelos, Guerrero, and the state of Mexico. Our primary endpoint was CIN 2 or worse, detected by colposcopy. We used a computer-generated randomisation sequence to randomly allocate patients to HPV screening or cervical cytology. Eight community nurses who were masked to patient allocation received daily lists of the women's names and addresses, and did the assigned home visits. We referred women with positive results in either test to colposcopy. We did per-protocol and intention-to-screen analyses. This trial was registered with the Instituto Nacional de Salud Pública, Mexico, INSP number 590.

Findings 12 330 women were randomly allocated to HPV screening and 12 731 to cervical cytology; 9202 women in the HPV screening group adhered to the protocol, as did 11 054 in the cervical cytology group. HPV prevalence was 9·8% (95% CI 9·1–10·4) and abnormal cytology rate was 0·38% (0·23–0·45). HPV testing identified 117·4 women with CIN 2 or worse per 10 000 (95·2–139·5) compared with 34·4 women with CIN 2 or worse per 10 000 (23·4–45·3) identified by cytology; the relative sensitivity of HPV testing was 3·4 times greater (2·4–4·9). Similarly, HPV testing detected 4·2 times (1·9–9·2) more invasive cancers than did cytology (30·4 per 10 000 [19·1–41·7] *vs* 7·2 per 10 000 [2·2–12·3]). The positive predictive value of HPV testing for CIN 2 or worse was 12·2% (9·9–14·5) compared with 90·5% (61·7–100) for cytology.

Interpretation Despite the much lower positive predictive value for HPV testing of self-collected vaginal specimens compared with cytology, such testing might be preferred for detecting CIN 2 or worse in low-resource settings where restricted infrastructure reduces the effectiveness of cytology screening programmes. Because women at these sites will be screened only a few times in their lives, the high sensitivity of a HPV screen is of paramount importance.

Funding Instituto Nacional de Salud Pública, the Health Ministry of Mexico, QiAGEN Corp

Introduction

The public health burden of cervical cancer in developing countries is high.[1] In 2008, about 37 000 deaths related to cervical cancer occurred in the Americas, costing about 545 000 DALYs.[1,2] Findings from randomised trials of more than 200 000 women[3–9] showed HPV DNA screening to be better than cervical cytology for detecting vaginal specimens could be especially useful for women with restricted access to health care[10] and could increase population coverage[11] because of increased acceptability and elimination of clinical examinations. Although good diagnostic performance and safety have been documented in research settings, no randomised trial has assessed the home-based performance of vaginal HPV testing.

Lancet 2011; 378:

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- HPV testing detected 4.2 times more invasive cancers than cytology (Pap).

Detection Rate

HPV testing

30.4 x 100,000

vs

Cytology (Pap)

7.2 x 100,000

Prevention of cervical cancer in women's hands: Mexico leads the way* The Lancet, October 26, 2011.

*Nubia Muñoz, Rolando Herrero
Colombian Cancer Institute, Bogota, Colombia (NM); and Early Detection and Prevention Section, International Agency for Research on Cancer, WHO, Lyon, France (RH)

Prevention of cervical cancer in women's hands: Mexico leads the way*

In *The Lancet*,[1] Eduardo Lazcano-Ponce and colleagues report the results of the first community-based randomised trial comparing the effectiveness of HPV DNA testing of vaginal samples self-collected at home with clinician-collected cervical cytology, for detection of prevalent cervical intraepithelial neoplasia (CIN) grade 2 or greater. The trial randomly assigned 20 256 Mexican women aged between 25 and 65 years of low socioeconomic status either to self-collection of samples for HPV testing (n=9202) or to clinican-collected cervical cytology (11 054). Women who were HPV positive or had cytological abnormalities (mild dysplasia or worse) were referred for diagnostic colposcopy and biopsies as needed.

The detection rate of cytological abnormalities was 0·38% (95% CI 0·23–0·45%), which is lower than usually reported.[2] This finding indicates low-quality cytology and shows the challenge of employing this technique in developing countries. Absence of inclusion of ASCUS among the cytological abnormalities is unlikely to explain this low prevalence. That mild cytological

investigate the use of HPV testing of home-based self-collected vaginal specimens. The self-collection method was almost universally accepted (98%) compared with the more complex and expensive clinic-based cytology (86%), which confirms the feasibility of self-collection in this population. Self-collected sampling for HPV testing is more sensitive for detection of precancerous lesions than cytology, but the HPV test should also be able to offer a similar negative predictive value to a clinician-collected sample for HPV testing. However, several studies have shown that sensitivity and specificity of self-collected samples for HPV testing are lower than the same test when collected by a clinician directly from the endocervix.[3,4] Alternative methods of self collection have been proposed with limited success, and a study[4] indicated that the sensitivity of vaginal self collections could be improved by use of a high throughput, low cost, PCR-based detection method (MALDI-TOF) without much sacrifice of specificity. The performance of new methods needs to be carefully scrutinised, particularly if they will be used in deprived areas where there might

Technological innovation in cervical cancer prevention and control programs in Mexico

Creating a detection infrastructure: HPV testing

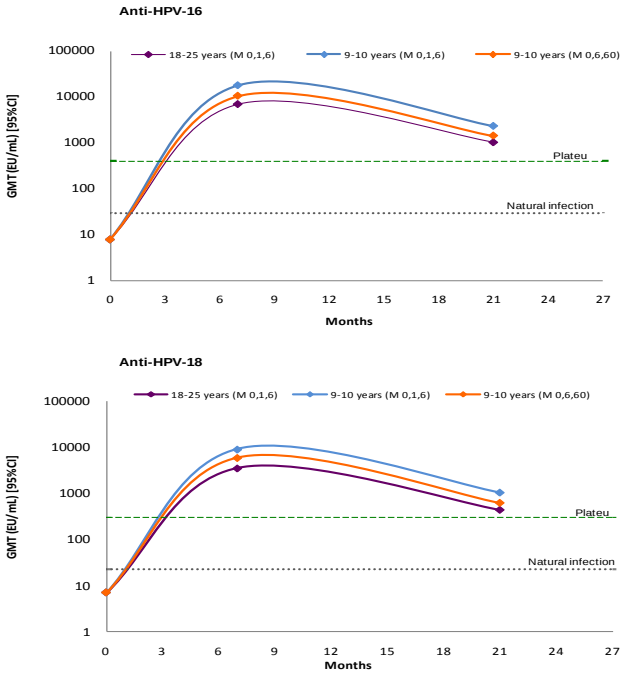
- **12 regional HPV laboratories in Mexico**

Research, development and implementation of innovative solutions in Public Health. 2007-2012

Initiating a vaccination schedule for girls 9-10 years of age

0 – 6 – 60 months

Antibody responses to HPV-16-18 at month 21



Objectives

- **Focus on age group (9–10 year olds)**
- **Increase coverage**
- **Decrease costs (from $80 down to $14 dollars per dose)**

Tobacco Research in the National Institute of Public Health, 2002-2012

1) National Tobacco Surveys

2) Contributes to development of social marketing

3) Design and evaluation of warnings in Mexico

Promotion designed at the INSP

"Enjoy smoke-free places"