

Original Research Report

Cervical cancer prevention in remote rural Nicaragua: A program evaluation

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Abstract

Background. Nicaragua has some of the highest rates of cervical cancer in Latin America and the world [Arrossi S, Sankaranarayanan R, Parkin DM. Incidence and mortality of cervical cancer in Latin America. *Salud Publica Mex.* 2003;45 (Suppl 3):S306–14]. In 2003, the Nicaraguan Ministry of Health, the Central American Institute of Health and the Maria Luisa Ortiz Clinic combined efforts to create an effective remote rural service network, with centralized quality-controlled cytology, and coordinated treatment.

Methods and materials. Data was taken from the clinic Pap log, tracking records, patient charts, and pathology reports. Patients were stratified by age (25 and older, and under 25). Standard indicators addressing key components in the entire continuum of an effective screening program were adapted from suggestions by a work group of the Pan American Health Organization.

Results. A total of 2132 women received Pap screening. 68% ($N = 1448$) were 25 and older and 32% ($N = 684$) were under 25. The proportion of high-grade abnormal screens was 3.7% for women over 25 and 0.4% for women under 25. The proportion of women with high-grade abnormal results who received diagnostic work-up and needed treatment was 94% for women over 25 and 100% for women under 25. The proportion of high-grade squamous cell Pap tests resulting in histologically confirmed disease was 68%. The ratio of pre-invasive disease to invasive disease was 1.9. The invasive cancer detection rate was 0.62%.

Conclusion. This program evaluation demonstrates that outreach to high-risk women, quality cytology screening and high rates of diagnostic follow-up and treatment can be conducted in remote, low-resource settings when coordinated efforts are made to remove barriers and ensure quality.

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Keywords: Cervical cancer; Prevention; Program evaluation; Papanicolaou; Cervical intraepithelial neoplasia; Developing countries; Latin America; Nicaragua

Background

In 2003, three organizations combined efforts to extend a new cervical cancer prevention program into Nicaragua's remote, medically underserved North Atlantic Autonomous Region (RAAN). These include the Clinica de Mujeres/Cooperativa Maria Luisa Ortiz (MLO Clinic), the Ginecobo program, and the Nicaraguan Ministry of Health (MINSA). All three organizations have prior experience

with cervical cancer prevention. Their combined efforts have created an effective remote rural service network, centralized quality-controlled cytology, coordinated treatment in the capital city of Managua, and a system of national strategic planning. This study is an evaluation of these programs.

The Clinica de Mujeres/Cooperativa Maria Luisa Ortiz (MLO Clinic) has been established since 1990 and is run by a women's cooperative in Mulukuku, Nicaragua. The clinic administers Pap tests and conducts outreach through health education, mobile clinics, a network of 20–40 health promoters, radio announcements, and transportation couriers. The MLO Clinic draws patients from the remote dispersed villages of the RAAN and is accessed by unpaved road, river

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Table 1
Pap tests taken at MLO clinic (2003)

| Program | Count | % Total |
|----------------------------|-------|---------|
| Women >25 years—Ginecobono | 1448 | 68 |
| Women <25 years—Matagalpa | 684 | 32 |
| Total | 2132 | 100 |

Table 2
Results of Pap tests at MLO clinic (2003)

| Result | Ginecobono >25 years (%) | Matagalpa <25 years (%) |
|----------------------------------------------------------------------|--------------------------|-------------------------|
| High-grade (high-grade squamous cell and abnormal glandular cell) | 3.7 | 0.4 |
| Low-grade (HPV changes to low-grade squamous intraepithelial lesion) | 3.0 | 7.9 |
| Normal | 91.1 | 89.8 |
| Unsatisfactory sample | 1.0 | 0.1 |
| Unconfirmed results | 1.2 | 1.8 |

or horse. The Ginecobono Program was established in 2000 by Instituto Centroamericano de la Salud (ICAS), a non-profit health services research organization. Ginecobono is designed to remove barriers to cervical cancer prevention in Nicaragua. The program distributes donated vouchers covering Pap tests and any necessary diagnostics and treatment. In addition, Ginecobono coordinates external quality control of both cytology and histopathology services, arranges same day diagnostics and treatment procedures in Managua, and assists clinics by maintaining centralized data information systems. The Nicaraguan Ministry of Health (MINSa) facilitates the National Alliance to Prevent Cervical Cancer, utilizes strategic planning to reach areas in most need, and encourages cooperation between sectors.

Methods

The World Health Organization’s (WHO) perspective is that to be effective, screening programs must operate

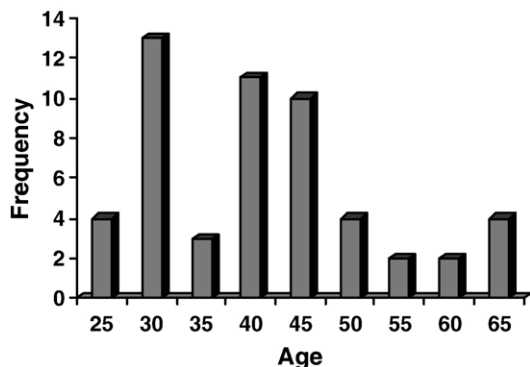


Fig. 1. Women with high-grade Pap results.

Table 3
Follow-up timeframe

| Total patients with high-grade Pap results requiring diagnostics and treatment | Complete Dx Tx within 6 months | | Complete Dx Tx within 12 months | | Complete Dx Tx within 18 months | |
|--------------------------------------------------------------------------------|--------------------------------|----|---------------------------------|----|---------------------------------|----|
| | Count | % | Count | % | Count | % |
| 53 ^a | 43 | 81 | 48 | 91 | 50 | 94 |

^a These counts are for the Ginecobono (25 years+) program but includes two 24-year-old patients who were initially screened under the Matagalpa services, but entered the Ginecobono program when they returned for follow-up. One remaining 23-year-old underwent a hysterectomy through the Matagalpa services.

within a complete system of related well-coordinated services [1]. The Pan American Health Organization (PAHO) has guided working groups to develop standards for performance indicators and data systems. The indicators used for the program evaluation presented here are adapted from these suggested standards [2]. The performance indicators used were proportion of high-risk women reached, reliability of detection, successful follow-up and treatment, and rate and stage of disease detection.

Data were taken from the clinic Pap log, tracking records, patient charts, and pathology reports. Pap results and follow-up were stratified into two age groups: women under 25 and women 25 and older. The MLO Clinic supports a separate program for each group. The Ginecobono program is for women 25 years and older. Women under 25 receive

Table 4
Positive predictive value (PPV) of Pap tests

| Pap test results | Count | Moderate dysplasia to invasive cancer histology | |
|---------------------------------|-----------------|-------------------------------------------------|----|
| | | Count | % |
| Moderate to high-grade squamous | 37 ^a | 25 | 68 |
| Abnormal glandular | 12 | 0 | 0 |

^a One woman was pregnant and had not yet received LEEP.

Table 5
Rate and stage of disease detection

| Results of diagnostics and treatment | Count | % | Rate (based on women receiving Pap tests) (%) |
|--------------------------------------|-------|-----|-----------------------------------------------|
| Invasive cancer | 9 | 18 | 0.62 |
| Pre-invasive high-grade lesion | 16 | 33 | 1.11 |
| Low-grade lesion | 14 | 29 | — |
| Normal | 10 | 20 | — |
| Total | 49 | 100 | |

Table 6
Comparison to the Alliance for Cervical Cancer Prevention (ACCP) [3] benchmarks and programs in USA

| Indicator | MLO clinic | ACCP benchmark [4] | NBCCEDP [5] | Bethesda (expected) [6] |
|---------------------------------------|------------|------------------------------|-------------|-------------------------|
| Proportion of high-risk women reached | 3.7% | 1–5% (unscreened population) | 0.2–1.5% | 0.45% |
| Success of follow-up and treatment | 94% | >90% | 86% | – |
| Reliability of detection (PPV) | 68% | Monitor, but no benchmark | 53.2–59.7% | 70–75% |
| Invasive cancer | 0.62% | Monitor, but no benchmark | 0.04% | – |
| Pre-invasive cancer | 1.11% | – | 0.07% | – |
| Pre-invasive to invasive cancer ratio | 1.9 | – | 17.5 | – |

screening and treatment through a network of cytology, pathology, and clinic services located in Matagalpa. The evaluation presented here focuses on the Ginecobono program.

Results

A total of 2132 women received Pap screening. 68% (*N* = 1448) were 25 and older and 32% (*N* = 686) were under 25 (Table 1). The proportion of high-grade abnormal screens (moderate dysplasia to squamous cell carcinoma, and abnormal glandular) was 3.7% for women over 25 and 0.04% for women under 25 (Table 2). Twenty-one percent of the women with abnormal results were 29 years old or younger. The age distribution for women with abnormal results is displayed in Fig. 1. The proportion of women with high-grade abnormal results who received diagnostic work-up and needed treatment was 94% for women over 25 and 100% for women under 25 (Table 3). The proportion of high-grade squamous cell Pap tests resulting in histologically confirmed disease was 68% (Table 4). The invasive

cancer detection rate was 0.62% (Table 5). The ratio of pre-invasive disease to invasive disease was 1.9 cases of pre-invasive disease diagnosed for every one case of invasive disease (Table 6). Table 6 presents a comparison of the MLO indicator values with international and USA expected values, and results from the National Breast and Cervical Cancer Early Detection Program which serves low-income women in the USA.

Conclusion

This program evaluation demonstrates that outreach to high-risk women, quality cytology screening, and high rates of diagnostic and treatment follow-up can be conducted in remote, low-resource settings when coordinated efforts are made to remove barriers and ensure quality. The key to the good performance of this program is the partnership between the MLO Clinic, Ginecobono, and MINSA (Fig. 2). This partnership integrates elements of both centralized and decentralized systems that help coordinate the entire process, from the remote villages in the RAAN to the labs and clinics in Managua.



Fig. 2. Multi-sector strategic partnership for cervical cancer prevention.

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