

Original Research Article

## A Comparison of Procedural Protocols and Cytology Methods of Pap Testing of Chacraseca Nicaragua versus the United States

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### ABSTRACT

Pap testing was a primary screening tool utilized for the early detection of cervical cancers, and its increased use in the past decades has significantly reduced mortality of cervical cancers in the United States. There was no previously published literature comparing the differences in methods and procedures of Pap testing between the United States and Chacraseca, Nicaragua. Major differences between Pap testing in these two regions included the United States using liquid based cytology and water-soluble lubricants for speculum insertion. Chacraseca utilized conventional cytology methods and no lubricant for speculum insertion. It is important to note that numerous studies suggested that the use of water-soluble lubricants does not alter the accuracy of either cytology methods. Although there was no previously published data describing compliance of Pap testing in Chacrasecan women, there was significant literature suggesting pain with dry speculum insertions, and fear of pelvic examination leading to decreased compliance for Pap testing in the United States. In order to best serve the women of Chacraseca, using water-soluble lubricants may create a more comfortable procedure that could increase compliance for Pap.

**Keywords:** Pap test, conventional cytology, liquid based cytology, Nicaragua, Chacraseca.

### INTRODUCTION

Cervical cancer used to be the number one cancer killing women in the United States and has dropped to number thirteenth due to the advancements in medical technology and screening methods. <sup>[1]</sup> The percentage of U.S. women that obtain Pap testing is drastically different compared to the women of Nicaragua. During a medical outreach trip to Chacraseca Nicaragua, four Pap tests were performed on local women, abiding by their healthcare procedures and protocols. This serves as a comparison of the techniques used most frequently to perform pap testing in the

United States versus Chacraseca, Nicaragua. The major difference noted is that the majority of physicians practicing in Chacraseca do not use any form of lubrication during speculum insertion for Pap testing with the concern that lubricants will interfere with cervical cytology. Based on this, there is concern that the pain associated with inserting a dry speculum may deter some women in Chacraseca from seeking cervical cancer screenings. <sup>[2]</sup> Furthermore, there are numerous studies in the scientific literature suggesting that water soluble lubricants used sparingly during speculum insertion do not alter the efficacy of the Pap test. <sup>[2,3]</sup>

This serves as a comparison of the collection and processing methods as well as a review of the current literature on Pap testing in both the United States and Nicaragua.

The incidence of deaths from cervical cancer in the U.S. has decreased over 70% since the implementation of Pap testing. [1] The Pap test allows physicians to detect dysplastic cervical epithelial cells, with the goal of implemented screenings being to reduce incidence of cervical cancers and detect their spread earlier. The American Cancer Society reports that 93-100% of squamous cell carcinomas of the cervix are associated with human papilloma virus DNA, which is a sexually transmitted virus. [1] If high-grade intraepithelial lesions are not detected and addressed early they may progress to cervical carcinomas. [1] This alone establishes the need for women to be seeing a primary care physician yearly not only for Pap testing but also for safe sexual practice patient education.

Although the cervical cancer is no longer the number one killer of women it remains a serious concern; in 2005 with 13,000 new cases of invasive cervical cancers diagnosed in women in the U.S. and of those cases 4,100 died. [1] The current recommendations by the United States Preventive Services Task Force advises that women between the ages of 21 and 29 years old have a Pap test once every three years and that women between the ages of 30-65 years old have a Pap test every 3 years or have Pap and Human Papilloma Virus testing every 5 years [1] A recent article surveyed women in the southern U.S. and reported that 88% of women had received a Pap test within the past 3 years. [4] More recently there have been concerns with over screening women for cervical cancers in the U.S. Contrary to the current guidelines recommending screening every 3 years, a study by Cooper et al. in 2015 stated that 48% of women

reported annual cervical cancer screening. [5]

The most common Pap test utilized in the U.S. is Thin prep. [6] Thin prep is a liquid based cytology, which is considered to be more sensitive and more specific in screening for cervical cancer than conventional cytology. [7] For most women in the U.S. a gynecologic visit consists of undressing and having a metal speculum, with a small amount of water-soluble lubricant added, inserted into the vaginal vault then dilated for the physician to visualize the cervix. The Thin prep spatula is rotated around the exocervix 360 degrees and then rinsed in the Preservcyt solution vial. The end cervical brush is then inserted slightly into the cervical os and turned ¼ to ½ rotation then rinsed in the Preservcyt vial. The vial with the collected cells is then sent off to a lab where the contents are filtered through a semi permeable membrane then smeared onto a slide. Thin prep recommends using either warm water or water-soluble lubricants prior to the procedure and needs to have greater than 5000 epithelial cells present in order to be considered a representative sample. [6,8]

Two major differences between the United State's protocols and Nicaragua's are that lubrication of any type is not a standard for speculum insertion and they utilize conventional cytology techniques. A study by Soneji et al. revealed only 35.8% of women in Nicaragua reported having a pap test in the past year. [9] Although the U.S. guidelines suggest Pap testing every 3 years there are no reports in the literature of that data for women of Nicaragua. Vastbinder et al. performed a study in Leon, Nicaragua, which is the largest city near Chacraseca, reporting that the coverage of pap testing was 60% of patients and obtaining Pap testing was not as much of a concern as the lack of follow up care with the patients. [10] However, trying to relate Vastbinder's work to the women of Chacraseca is not without flaw,

as there are more healthcare facilities available in Leon in comparison to Chacraseca.

The local physicians of Chacraseca use the conventional cytology approach to Pap testing. First, inserting a dry metal speculum into the vaginal vault and dilating the speculum until the cervix is visualized. Using a tongue depressor the exocervix is scraped and then materials are smeared onto the top half of a glass slide. A cotton tip applicator is then inserted slightly into the cervical os and rotated several times to collect the endocervical cells, then smeared onto the bottom half of the same glass slide, being careful not to mix the two samples. The slide is then sprayed with an aerosol fixative and allowed to dry for 10 minutes. Once dry the sample is wrapped in the respective patient's paper chart, stapled shut and sent off to the lab for cytological analysis.

The concern with pain associated with not using lubrication during speculum insertion is that it may lead to decreased compliance with Pap testing. Kahn et al.'s study suggests that fear of pain associated with pap testing is the number one barrier of adolescents seeking Pap testing. [11] There are numerous other studies comparing pain associated with not using lubricants during speculum insertion. [2,12] Uygur et al. compared pain scales during speculum insertion and Pap testing accuracy using a water-soluble gel group and a control group using only warm water and their effects on the accuracy of both conventional cytology and liquid based cytology. The results indicated that there were significant increases in pain amongst the control groups versus the gel groups and that there were no significant changes in number of inconclusive Pap test results between these groups. [2] Simvali et al. performed a similar study however instead of using water for the control group they used a dry speculum, assessing pain scales during speculum insertion and dilation. One drawback of Simvali's study is that

they only looked at the effects of water-soluble lubricants on liquid based pap testing; although this may not prove beneficial to Nicaraguan physicians as they use conventional cytology methods it was telling of pain associated with speculum insertion. Simvali's work also indicated significant increases pain in control groups during both insertion and dilation of the speculum and with no significant difference in liquid based Pap test accuracy. [12] It is important to note that Simvali's work reported pain was rated the worst in the post-menopausal age groups, which may be attributed to vaginal atrophy symptoms commonly seen in that population. [13] More recent literature is investigating the use of topical anesthetics such as lidocaine prior to speculum insertion in post-menopausal women, due to the pain associated with the significant lack of lubrication. [14]

Uygur et al.'s work is of particular importance as it illustrated that the use of water-soluble lubricants does not negatively impact the Pap test results. In Uygur's methods they describe only using a "dime-sized amount" of the lubrication applied to the external surface of the speculum. [2] Furthermore a number of other studies support that modest lubrication applied to the external surface of the speculum does not impair cytologic and infectious evaluation of the cervix. [3,15]

In regard to liquid based pap testing, the Thin prep cells and Preservcyst fluid are filtered through a semi permeable membrane filter in order to collect the aforementioned 5000 epithelial cells for adequate cytology. However the filter is unable to detect the difference between epithelial cells and debris. Consequently, if non-water soluble lubricants containing carbomers are used this may affect the cell counts, as the filter cannot detect the difference between the carbomer compounds and epithelial cells. [8] Thus, the use of non water-soluble lubricants is

not recommended prior to Pap testing. To further investigate the effects of water-soluble lubricants on liquid based Pap testing, Hathaway et al. directly contaminated Thinprep specimen vials and assessed the effects on Pap testing. There was no significant difference in the accuracy of contaminated versus non-contaminated Thinprep samples. [16] Therefore, there is mounting evidence that suggests using water-soluble lubricants for liquid based or conventional Pap testing does not affect the efficacy of the test results. [2,3,12,16]

There are obviously drastic differences illustrated between Pap testing methods and availability of testing between the women of the United States versus that of Chacraseca, Nicaragua. This serves to clarify any misunderstandings regarding the use of lubricants on the effects of pap testing. For the women of Nicaragua this may change their experience by implementing the use of lubricants, thus making a less painful pap test. Less pain associated with this screening test may lead to increased compliance with screening amongst the women of Nicaragua, particularly those of post-menopausal age groups. The implementation of Pap testing in the United States over the past years proves that continued screening can significantly change the number of women devastated by cervical cancers. Early and consistent screening may save many lives and the first step is getting those women into the clinics, discussing the importance of having a Pap test, and performing a more comfortable procedure.

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