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Editorial

The Critical Role of Universal Colposcopy Triage and Genotyping for HPV16/18 Severity Based on Cyto-Colpo-Histological Correlation

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Abstract

Objective: To analyze the correlation between cytology, colposcopy, and histology in HPV-positive women, focusing on high-risk genotypes 16 and 18.

Methods: A cross-sectional study of 174 hr-HPV-positive women. All underwent cytology, colposcopy (with biopsy if needed), and genotyping. Analysis focused on 96 patients with confirmed histological lesions.

Results: The overall cytology-colposcopy-histology correlation was 87.5%. Overall Sensitivity: Cytology (95.83%), Colposcopy (91.67%). HPV16 (23 cases): 100% correlation for all tests. HPV18 (15 cases): 93.33% correlation (100% cytology, 93.33% colposcopy).

Conclusion: The combination of cytology, universal colposcopy, and HPV genotyping is a highly effective triage strategy. The near-perfect correlation for HPV16/18 confirms their high oncogenic risk and supports using genotyping for risk stratification. This integrated approach enables early identification of high-risk patients, optimizes resources, and guides personalized management to prevent cervical cancer.

Keywords: *Cytology; Colposcopy; HPV16; HPV18; Cervical Cancer; High-Risk Human Papillomavirus (hr-HPV)*

Introduction

Cervical cancer remains a significant global health burden, with persistent infection by high-risk human papillomavirus (hr-HPV) being its necessary cause [1]. Among the hr-HPV genotypes, HPV16 and HPV18 are the most oncogenic, accounting for approximately 70% of all cervical cancers worldwide [2]. While cytology has been the cornerstone of cervical screening, its variable sensitivity has led to the adoption of more reliable triage strategies, including HPV genotyping and colposcopy, for women testing positive for hr-HPV [3]. This study analyzes the correlation between cytology, colposcopy, and histological findings in a cohort of HPV-positive women, emphasizing the performance of these tests for the high-risk genotypes 16 and 18.

Methods

A cross-sectional analysis was conducted at the Mariana Grajales Maternity Hospital in Santa Clara from 2020 to 2024. The study included 174 women positive for any hr-HPV type. All participants underwent cervical cytology, colposcopy with directed biopsy if abnormalities were detected, and viral genotyping. The analysis focused on the 96 patients with histologically confirmed cervical lesions, evaluating the diagnostic correlation between the tests.

Results

Out of 174 HPV-positive women, 96 (55.17%) had histologically confirmed cervical lesions. The overall correlation between a positive cytology and a positive colposcopy (cyto-colpo-histological correlation) was 87.5%.

- Positive cytology: 92/96 cases (95.83%).
- Positive colposcopy: 88/96 cases (91.67%).

When stratified by the most oncogenic genotypes, the results demonstrated exceptional diagnostic accuracy:

- For HPV16 (23 cases):
- Positive cytology: 100% (23/23).
- Positive colposcopy: 100% (23/23).
- Cyto-colpo-histological correlation: 100%.
- For HPV18 (15 cases):
- Positive cytology: 100% (15/15).
- Positive colposcopy: 93.33% (14/15).
- Cyto-colpo-histological correlation: 93.33%.

Discussion

Our findings underscore the high concordance (87.5%) between cytology and colposcopy for detecting cervical lesions, supporting their complementary use in the triage algorithm [4]. Cytology showed high sensitivity (95.83%), while colposcopy, by allowing magnified visualization and directed biopsy, confirmed its indispensable role in diagnostic confirmation and management [5].

HPV genotyping is critical for risk stratification. The perfect correlation (100%) observed in patients infected with HPV16 confirms the known high aggressivity and lesion potential of this genotype, where both diagnostic tests were unequivocal [2]. For HPV18, the high correlation (93.33%) reinforces its high-risk category, though the minor discordance highlights the need for a high clinical suspicion even with apparently normal colposcopies in these patients, a finding consistent with literature noting that HPV18 is sometimes associated with endocervical lesions less visible colposcopically [1].

Implementing a strategy of universal colposcopy triage for all hr-HPV-positive women, complemented by specific genotyping for HPV16/18, would allow for:

1. Accurate and early identification of patients at the highest risk of neoplastic progression.
2. Resource optimization by prioritizing more intensive management and follow-up for those with the most severe genotypes.
3. Reduction of patient anxiety for those with lower-risk genotypes who may be managed with less frequent follow-up [3,5].

Conclusion

This study demonstrates that combining cytology, universal colposcopy, and HPV genotyping forms a highly effective triage strategy. The excellent cyto-colpo-histological correlation, which is nearly perfect for genotypes HPV16 and HPV18, confirms the utility of this integrated approach. We recommend implementing this protocol to improve detection, classify severity, and guide personalized clinical management for HPV-positive patients, thereby advancing the prevention of cervical cancer.

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