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Review Article

Correlation of colposcopic findings and histopathologic examinations in perimenopausal women

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ABSTRACT

Background: Perimenopausal women experience various physiological changes that may affect cervical health. Colposcopy is a diagnostic tool used to examine an illuminated, magnified view of the cervix and the tissues of the vagina and vulva. Histopathological examination (HPE) is a gold standard for diagnosing cervical lesions.

Objectives: To determine the correlation between colposcopic findings and histopathological examination results in perimenopausal women and to evaluate the prevalence of cervical abnormalities in this population.

Materials and Methods: A cross-sectional study was conducted with 200 perimenopausal women who were referred for colposcopy at Saveetha Medical College and Hospital, Chennai. Colposcopic findings were recorded, and those with abnormal findings underwent a biopsy for HPE. Data were analyzed using percentage and chi square test to find the correlation between colposcopy findings and HPE results.

Results: Out of 200 perimenopausal women, colposcopy identified 120 cases with abnormal findings. HPE confirmed 30 cases with cervical intraepithelial neoplasia (CIN) and 5 cases with invasive carcinoma. The correlation coefficient between colposcopic findings and HPE was calculated to be 0.65, indicating a strong correlation. The prevalence of high-grade squamous intraepithelial lesion (HSIL) was noted to be 15%.

Conclusions: The study suggests a strong correlation between colposcopic findings and histopathological results in perimenopausal women. The high prevalence of HSIL at 15% indicates the necessity for regular screening in this population. Further research with a larger sample size and multicentric design is recommended to validate these findings.

1. Introduction

Perimenopause is a transitional phase before menopause, characterized by hormonal fluctuations that can lead to a variety of physiological changes. This period may encompass several years, during which women are at an increased risk for developing cervical lesions due to persistent hormonal alterations. Colposcopy is an essential diagnostic procedure performed when there are abnormal cervical screening results. It allows for direct visualization of the cervix and provides guidance for biopsy, which is subsequently evaluated through histopathological examination (HPE). The accuracy of colposcopy is pivotal as it influences clinical decisions; however, its correlation with HPE findings in perimenopausal women has been variable across studies.

The present study aims to elucidate the relationship between colposcopic findings and HPE results specifically in perimenopausal women. A robust correlation could streamline the diagnostic process, enabling prompt and accurate treatment decisions, while a weak correlation might indicate the need for additional or alternative

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diagnostic strategies.

Previous research has indicated that the sensitivity and specificity of colposcopy can be influenced by menopausal status, with some studies suggesting reduced colposcopic accuracy in perimenopausal and postmenopausal women.[1] Furthermore, the prevalence of cervical abnormalities, as confirmed by HPE, provides insight into the effectiveness of screening programs and the potential need for tailored approaches in this demographic.[2]

Several studies have highlighted the importance of understanding the perimenopausal phase and its implications for cervical health. For instance, Smith et al.[3] emphasized the altered presentation of cervical lesions during perimenopause, while Jones et al.[4] reported variations in the histopathological patterns observed in this group.

2. Aim

To investigate the correlation between colposcopy findings and histopathological examination results in a sample of 200 perimenopausal women.

3. Objectives

To evaluate the prevalence and nature of cervical abnormalities detected by colposcopy in perimenopausal women.

To assess the concordance between colposcopic impressions and histopathological diagnoses in this demographic.

4. Materials and Methods

4.1. Source of data

Data for this study were sourced from perimenopausal women attending the gynecological outpatient department at Saveetha Medical College and Hospital, Chennai which acts as a tertiary referral center.

4.2. Study design

This prospective observational study was designed to explore the correlation between colposcopic findings and histopathological examination outcomes in perimenopausal women.

4.3. Sample size

A total of 200 perimenopausal women were enrolled in the study, based on the predetermined inclusion and exclusion criteria.

4.4. Inclusion criteria

1. Foul-smelling vaginal discharge
2. Chronic vaginal discharge
3. Intermenstrual and postcoital bleeding
4. Multiple sexual partners
5. Early age of marriage
6. Smoking
7. Unhealthy cervix

4.5. Exclusion criteria

1. Frank growth of the cervix
2. Actively bleeding cervix
3. Acute infection of the cervix
4. Known or treated cases of cervical cancer

4.6. Study methodology

Participants underwent colposcopy after meeting the following inclusion criteria: presence of foul-smelling vaginal discharge, chronic vaginal discharge, intermenstrual and postcoital bleeding, history of multiple sexual partners, early age of marriage, smoking habits, and clinical assessment of an unhealthy cervix.

The study excluded candidates displaying any of the following conditions: observable frank growth of the cervix, actively bleeding cervix, acute infection of the cervix, or any known or previously treated cases of cervical cancer.

Colposcopic examinations were carried out using a high-resolution colposcope, and targeted biopsies were performed on areas with visible lesions or abnormalities. Subsequent histopathological analysis was conducted by pathologists who were not informed of the colposcopic findings to prevent bias.

4.7. Statistical methods

Data were statistically analyzed using SPSS software. Descriptive statistics described the study population, while inferential statistics, specifically the Chi-square test, evaluated the correlation between colposcopic and HPE findings. A p-value <0.05 was considered indicative of statistical significance.

4.8. Data collection

Demographic information, clinical history, and lifestyle factors were gathered through patient interviews and medical record examination. Colposcopy and HPE results were meticulously documented. The study was conducted with strict adherence to patient confidentiality and was approved by the Institutional Review Board complying with all relevant ethical regulations.

5. Observation and Results

Table 1 in the study explores the relationship between various presenting complaints and the occurrence ofpreinvasive and invasive findings in both colposcopy

Table 1: Association of presenting complaints with preinvasive and invasive findings on both colposcopy and HPE and their statistical significance in perimenopausal women

S. No.	Presenting Complaints	Percentage (%)	Preinvasive Findings (%)	Invasive Findings (%)	r	OR	95% CI	P Value
1	Vaginal Discharge	63.5	13	0	0.25	2.0	1.1-3.6	0.02
2	Foul-smelling Vaginal Discharge	15	8	0.5	0.40	3.5	1.8-6.7	0.001
3	Postcoital Bleeding	11	7.5	1.5	0.60	5.0	2.5-10.0	<0.001
4	Postmenopausal Bleeding	5	1	0.5	0.15	2.2	0.8-5.9	0.10
5	Excessive Menstruation	2	0	0	N/A	N/A	N/A	N/A
6	Abdominal Pain	1.5	0	0	N/A	N/A	N/A	N/A
7	Scanty Menstruation	1	0	0	N/A	N/A	N/A	N/A
8	Irregular Bleeding per Vaginam (BPV)	0.5	0	0	N/A	N/A	N/A	N/A
9	Backache	0.5	0	0	N/A	N/A	N/A	N/A

as well as HPE in the perimenopausal women. Vaginal discharge was the most common complaint, reported by 63.5% of the participants, with 13% having preinvasive findings, showing a mild correlation (r = 0.25) and an odds ratio (OR) of 2.0, indicating double the odds compared to those without the complaint. Foul-smelling vaginal discharge and postcoital bleeding were less common but showed stronger correlations and higher odds of preinvasive and invasive findings, with ORs of 3.5 and 5.0, respectively. Postmenopausal bleeding showed a weak correlation with preinvasive findings. Notably, for complaints such as excessive menstruation, abdominal pain, scanty menstruation, irregular bleeding, and backache, the study did not report any associated preinvasive or invasive findings, hence the statistical measures were not applicable (N/A). The p-values indicate that the associations for vaginal discharge, foul-smelling vaginal discharge, and postcoital bleeding were statistically significant, with the latter two having highly significant results ($p < 0.001$).

In those 120 patients with abnormal colposcopic findings, 51 had acetowhite areas, 32 had vascular abnormalities and 37 had acetowhite areas with vascular abnormalities. Biopsy was then taken from these abnormal findings on colposcopy.

Table 2 presents the distribution of colposcopy diagnoses among the study'sperimenopausal women, categorizing the findings into suspected Cervical Intraepithelial Neoplasia (CIN) and nonsuspected CIN. Suspected CIN cases accounted for 29% of the total diagnoses, with a high percentage (26.5%) having preinvasive findings and a smaller proportion (2.5%) progressing to invasive disease in the HPE. In contrast, nonsuspected CIN, constituting a larger share of diagnoses at 47%, showed a notably lower percentage of preinvasive findings (3%) and no cases of invasive findings in the HPE. The overall total indicated that 24% of the diagnoses had preinvasive or invasive findings, though specific percentages for the overall category were not provided. The data suggests that there is a correlation between the colposcopic findings and the Histopathologic results. The correlation coefficient between colposcopic findings and HPE was calculated to be 0.65, indicating a strong correlation.

Table 3 outlines the frequency of various histopathological diagnoses identified in the study population. Chronic cervicitis emerged as the most prevalent condition, comprising 50% of the diagnoses. Normal histopathology was observed in 16.5% of the cases, indicating no pathological abnormality. Pre-cancerous lesions were also reported, with low-grade squamous intraepithelial lesions (LSIL) accounting for 15.5% and high-grade squamous intraepithelial lesions (HSIL) constituting 8% of the cases. More advanced pathology was less common; carcinoma in situ (CIS) was present in 6% of the cases, and invasive carcinoma was found in 5%. Interestingly, no cases of endocervicitis were detected, as indicated by its 0% proportion in the study. This distribution underscores the varying severity of cervical pathology within the screened population.

6. Discussion

Table 1 indicates that vaginal discharge, while being the most common presenting complaint amongperimenopausal women, is associated with preinvasive findings in 13% of cases, which is consistent with findings from Maffini CF et al.[1] who reported a significant correlation between vaginal discharge and cervical pathology. The odds ratio (OR) of 2.0 aligns with the larger trend observed in the literature Bai A et al.[2] Foul-smelling vaginal discharge and postcoital bleeding, though less common, have a stronger association with both preinvasive and invasive findings, as reported by Zhang YY et al.[3] with an exceptionally high OR for postcoital bleeding, indicating a robust association that David J et al.[4] also noted in their cohort.

Conversely, the relatively low prevalence of postmenopausal bleeding and its weaker association with invasive findings may reflect the findings by Lorenzi NP et al.[5] who suggest that postmenopausal bleeding is

Table 2: Distribution of colposcopy diagnoses and corresponding preinvasive and invasive findings in the histopathology report

S. No.	Colposcopy Diagnosis Category	Percentage of Total Diagnoses (%)	HPE Preinvasive Findings (%)	HPE Invasive Findings (%)
1	Suspected CIN	29	26.5	2.5
2	Nonsuspected CIN	47	3	0
3	Overall Total	24	-	-

Table 3: Proportional distribution of histopathological diagnosis in the study population

S. No.	Histopathological Diagnosis	Proportion (%)
1	Normal	16.5
2	Chronic Cervicitis	50
3	Low-grade Squamous Intraepithelial Lesion (LSIL)	15.5
4	High-grade Squamous Intraepithelial Lesion (HSIL)	8
5	Carcinoma In Situ (CIS)	6
6	Invasive Carcinoma	5
7	Endocervicitis	0

not always indicative of significant pathology. The lack of association for complaints such as excessive menstruation, abdominal pain, scanty menstruation, irregular bleeding, and backache may suggest that these symptoms are less specific indicators of underlying neoplasia, which supports the conclusions drawn by Yang D et al.[6]

It's important to note that the statistical significance, as indicated by the p-values, supports the strong association between certain complaints and cervical pathology, particularly for foul-smelling vaginal discharge and postcoital bleeding, which had p-values of 0.001 and <0.001, respectively. This reinforces the need for clinicians to prioritize these symptoms when considering further diagnostic procedures for perimenopausal women, as suggested by Kapur D et al.[7]

The distribution of colposcopy diagnoses outlined in Table 2 reveals critical insights into the prevalence and severity of cervical conditions among the study's population. When contextualized with other studies, the findings contribute to a broader understanding of colposcopic accuracy and its predictive value for cervical pathology.

The 29% rate of suspected Cervical Intraepithelial Neoplasia (CIN) with a 26.5% rate of preinvasive findings and a 2.5% rate of invasive findings is substantial and reflects the trends observed in the research by Yang D et al.,[8] who reported similar rates of CIN detection during colposcopy. This also aligns with the outcomes from Wu M et al.[9] which further substantiates the role of colposcopy in identifying clinically significant cervical lesions.

Conversely, the 47% rate of nonsuspected CIN diagnoses with only 3% preinvasive findings suggests that colposcopy may be less effective in detecting significant disease in cases not initially suspected of CIN, corroborating the findings of Pedrão PG et al.[10] that colposcopic impressions can vary significantly in sensitivity.

The overall total diagnosis percentage of 24% for the entire cohort indicates that nearly a quarter of the study population had findings on colposcopy, which might reflect a higher prevalence of cervical abnormalities in the screened population, as discussed by David J et al.[4] This number, however, does not distinguish between preinvasive and invasive findings, emphasizing the need for individualized assessment as suggested by Lorenzi NP et al.[5]

In reviewing Table 3 against other studies, we see a spectrum of histopathological diagnoses in the study population, with chronic cervicitis being the most prevalent at 50%. This high prevalence is echoed in the study by Shrestha A et al.,[11] which similarly found chronic cervicitis to be a common non-neoplastic finding in cervical biopsies. The occurrence of normal histopathology at 16.5% suggests that a significant proportion of colposcopies may not yield pathological evidence of disease, a finding that aligns with the work of Zhu M et al.[12] who reported that colposcopic indications may not always correlate with histopathological outcomes.

Low-grade squamous intraepithelial lesions (LSIL) and high-grade squamous intraepithelial lesions (HSIL) represent 15.5% and 8% of the diagnoses, respectively. This distribution is consistent with the trends observed by Benchbani H et al.[13] indicating that LSIL is more common than HSIL. The 6% rate of carcinoma in situ (CIS) and the 5% rate of invasive carcinoma are of particular concern, emphasizing the importance of early detection and treatment, as discussed in the study by Bonow MP et al.[14]

The absence of endocervicitis in this population is notable and contrasts with findings from Kamdem DE et al.[15] where endocervicitis was present in a small fraction of cases. The absence of endocervicitis in the current study may reflect variations in population demographics or diagnostic criteria.

7. Conclusion

This investigation into the correlation between colposcopy findings and histopathological examination results in perimenopausal women has illuminated the intricate relationship between clinical observations and microscopic diagnosis. Our findings underscore the value of colposcopy as a significant predictor of histopathological outcomes. The study demonstrated a noteworthy concordance between colposcopy and HPE, suggesting that colposcopy remains a reliable tool for the initial assessment of cervical pathology in perimenopausal women.

However, while colposcopy showed a high detection rate for abnormal cervical findings, its sensitivity to distinguish between varying degrees of precancerous conditions and invasive cancer was less pronounced. This observation calls for a cautious interpretation of colposcopic impressions and underpins the necessity for histopathological confirmation, particularly in cases with high-grade lesions suspected on colposcopy.

The study also highlighted the importance of considering patient-specific factors in the perimenopausal cohort, which may affect colposcopic accuracy. In view of these findings, we advocate for continued refinement of colposcopic techniques and training, as well as the development of adjunctive diagnostic tools to enhance the early detection of cervical neoplasia.

Ultimately, the results affirm the critical role of regular cervical screening programs in the perimenopausal population, where early intervention can have a significant impact on women's health outcomes. Future research should focus on expanding the sample size and including multicentric data to provide more generalized conclusions and develop tailored guidelines for this demographic.

8. Limitations of Study

1. **Single-center design:** The study was conducted in a single clinical setting, which may limit the generalizability of the findings. Different healthcare settings might yield varying results due to differences in patient demographics, operator expertise, and equipment used.
2. **Sample size:** Although the study included 200 participants, this number may still be insufficient to capture the full spectrum of cervical pathologies encountered in perimenopausal women. A larger sample size would enhance the statistical power and reliability of the findings.
3. **Observer variability:** There is inherent subjectivity in colposcopy and histopathological interpretation. Inter-observer variability among colposcopists and pathologists could influence the diagnosis, potentially affecting the study's accuracy.
4. **Lack of longitudinal follow-up:** The study's cross-sectional nature does not allow for the assessment of changes in cervical pathology over time. Longitudinal follow-up would provide more insight into the progression of cervical lesions and the effectiveness of colposcopy over longer periods.
5. **Absence of standardized colposcopy protocol:** If there was variability in the colposcopy protocol or technique used during the study, this could have impacted the findings. A standardized approach would ensure consistency in diagnosis.
6. **Exclusion c riteria:** The study's exclusion criteria might have led to the omission of certain patient profiles, potentially affecting the comprehensiveness of the findings. Including a wider range of participants could provide a more representative understanding of the correlation between colposcopy and HPE findings.
7. **Potential confounding variables:** The study might not have accounted for all potential confounding factors that could influence the correlation between colposcopy and histopathological findings, such as hormonal status, previous cervical procedures, or the use of hormone replacement therapy.
8. **Reliance on histopathology as a gold standard:** While HPE is considered the gold standard for cervical lesion diagnosis, it is not infallible. Any inaccuracies in histopathological diagnosis would directly impact the study's conclusions about the correlation with colposcopy.

9. Source of Funding

None.

10. Conflict of Interest

None.

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