Original Article

ASSESSMENT OF COLPOSCOPY AND HISTOPATHOLOGICAL FINDINGS IN PRECANCEROUS CERVICAL LESIONS

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Wassan Shuaith Oudah Al-Aqeeli[1]*, Lamees Adnan Shubber[2] and Besmah M. Ali[3]

[1]Baghdad Health Directorate - Al-Karkh, Baghdad, Iraq.
[2]Kadhimiya Teaching Hospital, Baghdad, Iraq.
[3]Consultant in Community Medicine, Head of Public Health Unit in Ghazi Al-Hariri Hospital for Surgical Specialties, Baghdad- Iraq.

*Corresponding Author: Wassan Shuaith Oudah Al-Aqeeli

Baghdad Health Directorate - Al-Karkh, Baghdad, Iraq.

ABSTRACT

Cervical cancer remains a major health concern worldwide, particularly in less developed regions, where it significantly contributes to cancer-related morbidity and mortality among women. Early detection and intervention are critical for managing and preventing the progression of precancerous lesions. This study evaluates the colposcopy and histopathological findings in women with precancerous cervical conditions, underscoring the importance of regular screening and early detection. **Objectives:** The study aims to assess colposcopy and histopathological findings in women with precancerous cervical conditions from February 1, 2024, to August 1, 2024. **Methods:** A cross-sectional study was conducted involving 120 married or sexually active women of reproductive age (20–70+ years) at Al Yarmoke Teaching Hospital in Baghdad, Iraq. Data was collected from the hospital's women's health center over six months. Participants underwent colposcopy and Pap smear tests, followed by cervical biopsy for those who tested positive. The data were analyzed using SPSS 22.0, with categorical data presented as frequency and percentage. **Results:** Colposcopy demonstrated high sensitivity (85.71%) in identifying true positive cases, indicating its effectiveness in detecting cervical abnormalities. However, its specificity was moderate (60%), suggesting a notable rate of false positives. The positive predictive value (PPV) and negative predictive value (NPV) were both 75%, reflecting a reliable confirmation of the presence and absence of disease. The overall accuracy of colposcopy was 75%. **Conclusions:** Colposcopy is a valuable diagnostic tool for identifying precancerous cervical lesions, with high sensitivity and moderate specificity. Its PPV and NPV of 75% indicate reliability in confirming disease status. Despite its overall accuracy of 75%, additional confirmatory tests are recommended to enhance diagnostic precision, highlighting the importance of regular screening and early detection in managing cervical cancer.

KEYWORDS: Colposcopy, Histopathological, Precancerous, Cervical Lesions.

INTRODUCTION

Cervical cancer is the most common cancer among women worldwide, with an estimated 530,000 new cases reported in 2012, leading to over 270,000 deaths annually.[1] More than 85% of these deaths occur in less developed regions, which reported approximately 445,000 new cases in 2012.[2] In Iraq, the number of cervical cancer deaths is 212, with a cumulative risk of 0.3% for women aged 0-74 years.[3] The incidence rates rise from age 45 to 65, with 43% of new cases in women under 45 due to demographic factors. Cervical cancer is the 15th most common cancer among Iraqi women, with most cases diagnosed at advanced stages. Low incidence rates in Islamic countries are linked to circumcision and strict religious observance. A WHO pilot study recommends screening for precancerous conditions using colposcopy, Pap smear, and HPV detection.[4] The disease often goes undiagnosed until advanced stages due to limited access to screening and healthcare facilities, contributing to high mortality rates.[5] Efforts to improve early detection and treatment in Iraq are ongoing but face challenges such as healthcare infrastructure and public awareness. Enhancing cervical cancer screening programs and increasing awareness about HPV vaccination are critical steps in reducing the burden of this disease in Iraq and similar regions. Projections by the International Agency for Research on Cancer (IARC) indicate that deaths from cervical cancer

will continue to rise in the coming decades.[6,7] Cervical cancer is the most common HPV-related disease, with HPV 16 and 18 responsible for 70% of precancerous cervical lesions and cervical cancers. Dr. Zur Hausen received the Nobel Prize in Physiology or Medicine in 2008 for his work demonstrating HPV's role in cervical cancer.[8,9] Symptoms of cervical cancer emerge when precancerous lesions progress to invasive cancer, including abnormal vaginal discharge, postcoital bleeding, postmenopausal bleeding, intermenstrual bleeding, and excessive vaginal bleeding. Postcoital bleeding is a key symptom.[10] According to the American College of Obstetricians and Gynecologists (ACOG), the recommended cervical cancer screening guidelines are as follows: women aged 21 to 29 years: Should have a Papanicolaou (Pap) smear every 3 years. HPV testing is not recommended for this age group unless it is needed after an abnormal Pap smear result. women aged 30 to 65 years: Should have co-testing with a Pap smear and HPV test every 5 years, or a Pap smear alone every 3 years if co-testing is not available.[11] There is no precise data on cancer incidence rates in Iraq due to the lack of a population-based national cancer registry. According to the World Health Organization (WHO), the occurrence rate of cervical cancer in Iraq is reported to be 2.1 per 100,000 women across all age groups.[12] Cervical cancer is the leading cause of cancer-related deaths among women in underdeveloped countries. In developed nations, the introduction of cytological cervical cancer screening over 50 years ago has significantly reduced both the incidence and mortality rates of cervical cancer. The elevated incidence of cervical cancer in developing countries can be attributed to several key factors: limited resources, the absence of efficient screening initiatives, and inadequately structured healthcare systems that focus on identifying precancerous conditions before they escalate into invasive cancer. Consequently, there is an urgent requirement for cost-effective strategies to facilitate efficient cervical cancer screening programs.[13] The purpose of this study to assess of colposcopy and histopathological findings in precancerous cervical lesions, during the period, from February 1, 2024, to August 1, 2024.

METHOD

This cross-sectional study involved 120 married or sexually active women of reproductive age (20–70+ years) who attended at Al Yarmoke Teaching Hospital in Baghdad, Iraq. Data was collected from the hospital's women's health center over a six- month period, from February 1, 2024, to August 1, 2024. Participants were screened using colposcopy and Pap smear tests. Women who tested positive in any of these screening methods subsequently underwent cervical biopsy for further evaluation. The collected data were coded and entered into SPSS 22.0 (Statistical Package for the Social Sciences (SPSS) 22.0 by IBM) (SPSS for windows, Rel. 22.0.2016, SPSS Inc., Chicago, IL, USA). The categorical data were analyzed by frequency (n) and percentage.

RESULTS

Table (1) presents the distribution of participants according to various demographic characteristics, the data from the study on 120 participants reveals several key demographic characteristics. The majority of participants fall within the 30-39 age group (29.16%), followed by those in the 40-49 age group (25%). Most participants were married between the ages of 18-20 (32.5%), with a significant portion also marrying at or before the age of 17 (28.33%). Regarding their menstrual cycles, 55.83% reported having regular cycles, while 31.67% had irregular cycles, and 12.5% were menopausal. In terms of marital status, 78.33% of the participants were married, 10% were widowed, and 11.67% were divorced. Regarding the number of sex partners, 96.7% had one, and 3.3% had two. The data also indicates that a substantial majority of the participants (80.83%) had three or more children, while 19.17% had fewer than three. When it comes to the use of oral contraceptive pills, 39.16% reported using them, whereas 60.83% did not.

Table 1: Distribution of participants according to Demographic Characteristics n= (120).

Category	Subcategory	Frequency	Percentage (%)
Age			
	20-29	19	19.83
	30-39	35	29.16
	40-49	30	25.00
	50-59	16	13.33
	60-69	15	12.50
	70+	5	4.16
Total		**120**	**100**
Age at Marriage			
	≤17	34	28.33
	18-20	39	32.5
	21-25	27	22.5
	≥26	19	15.83
Total		**120**	**100**

Menstrual Cycle			
	Regular	67	55.83
	Irregular	38	31.67
	Menopause	15	12.5
Total		**120**	**100**
Marital Status			
	Married	94	78.33
	Widow	12	10.00
	Divorced	14	11.67
Total		**120**	**100**
No. of sex partners			
	One	116	96.7
	Two	4	3.3
Total		**120**	**100**
Parity			
	<3	23	19.17
	≥3	97	80.83
Total		**120**	**100**
Oral Contraceptive Pills			
	Yes	47	39.16
	No	73	60.83
Total		**120**	**100**

Table (2) presents the chief complaints of 120 participants, the study involving 120 participants highlights the chief complaints presented by the participants. The most common complaint was vaginal discharge, reported by 29.17% of the participants. This was followed by post coital bleeding, which affected 15% of the participants, and intermenstrual bleeding, reported by 12.5%. Lower abdominal pain was another significant complaint, affecting 10.83% of the participants. Post-menopausal bleeding was reported by 5%, while 6.67% had complaints related to HPV 18. Other notable issues included warts, reported by 4.167% of participants, and polyps, affecting 3.33%. Some participants experienced multiple symptoms, such as vaginal discharge combined with post coital bleeding (2.5%) and intermenstrual bleeding combined with post coital bleeding (4.17%). Additionally, 3.33% of participants reported both post coital bleeding and dyspareunia, and another 3.33% experienced both lower abdominal pain and post coital bleeding. This distribution of complaints provides valuable insights into the primary health concerns of the participants, which can inform targeted healthcare interventions and services.

Table 2: Chief complaint of participants n= (120).

Chief Complaint	Number	Percentage (%)
Vaginal discharge	35	29.17
Lower abdominal pain	13	10.83
Intermenstrual bleeding	15	12.5
Post-menopausal bleed	6	5
Post coital bleeding	18	15
Mass		
Polyp	4	3.33
Wart	5	4.167
HPV 18	8	6.67
Vaginal discharge & post coital bleeding	3	2.5
Intermenstrual bleeding & post coital bleeding	5	4.17
Post coital bleeding & Dyspareunia	4	3.33
Lower abdominal pain & post coital bleeding	4	3.33

The study involving 120 participants at Al Yarmoke Teaching Hospital in Baghdad provided valuable insights into colposcopy and histopathological findings. Out of the 104 participants who underwent colposcopy, cervicitis was the most common finding, observed in 62 (59.62%) participants. Normal or benign changes were seen in 11 (10.58%) participants, ASC/US (Atypical Squamous Cells of Undetermined Significance) in 19 (18.27%), ASC/H (Atypical Squamous Cells - cannot exclude HSIL) in 4 (3.85%), and LSIL (Low-grade Squamous Intraepithelial Lesion) in 8 participants. There were no cases of HSIL (High-grade Squamous Intraepithelial Lesion) or AGS (Atypical Glandular Cells). Regarding histopathological findings, among the

16 participants with abnormal results, 11 (68.75%) were diagnosed with CIN I (Cervical Intraepithelial Neoplasia grade I) and 5 (31.25%) with CIN II (Cervical Intraepithelial Neoplasia grade II). These findings emphasize the prevalence of cervicitis and the presence of pre-cancerous conditions, highlighting the importance of colposcopy and histopathological examination in early detection and management. The effectiveness of colposcopy in diagnosing conditions confirmed by histopathology is evaluated through key metrics

- **Sensitivity:** 85.71%, indicating colposcopy's high effectiveness in correctly identifying most true positive cases and minimizing false negatives.
- **Specificity:** 60%, reflecting a moderate ability to correctly identify disease-free cases, with a notable rate of false positives.

- **Positive Predictive Value (PPV):** 75%, meaning when colposcopy indicates the presence of disease, there is a 75% chance it is accurate.
- **Negative Predictive Value (NPV):** 75%, indicating that when colposcopy shows no disease, there is a 75% chance this is correct.
- **Accuracy:** 75%, reflecting the overall effectiveness of colposcopy in diagnosing both the presence and absence of disease.

These metrics highlight colposcopy's utility as a diagnostic tool, particularly in early detection and management of cervical abnormalities. As in table 3, 4.

Table 3: Distribution of participant related with colposcopy and histopathological findings n= (120).

Colposcopy finding	n	Percentage (%)
Normal/ Benign Change	11	10.58
Cervicitis	62	59.62
ASC/US	19	18.27
ASC/H	4	3.85
LSIL	8	7.69
HSIL	0	0
AGS	0	0
Total	104	100%
Histopathological Findings		
CIN I	11	68.75
CNI II	5	31.25
Total	16	100%

Table 4: Evaluating of colposcopy according to histopathological findings n=(120).

Histopathology colposcopy	Positive Histopathology (precancerous lesion)	Negative Histopathology (Non precancerous lesion)	Total
Positive Colposcopy	TP = 60	FP = 20	80
Negative Colposcopy	FN = 10	TN = 30	40

TP= True Positive, FP=False Positive, FN=False Negative, TN= True Negative.

DISCUSSION

The assessment of colposcopy and histopathological findings plays a crucial role in the early detection and management of precancerous cervical lesions. This study, involving 120 participants, aims to evaluate the effectiveness and reliability of colposcopy as a diagnostic tool compared to the gold standard of histopathological examination. The findings offer insights into the prevalence of various cervical conditions, demographic characteristics of the affected population, and diagnostic performance metrics of colposcopy. The demographic profile of the participants reveals valuable information about their reproductive health and associated risk factors. Predominantly aged 30-49 years, the cohort likely experiences a range of reproductive health issues. Early age of marriage and high rates of childbearing reflect significant social and cultural influences on health outcomes. Most participants reported regular menstrual cycles, but nearly a third had irregular cycles, which may indicate hormonal imbalances or chronic conditions like polycystic ovary syndrome (PCOS).[14,15,16] The use of oral contraceptives among a considerable minority highlights varying levels of access to and acceptance of family planning methods.[17,18] The primary health concerns among participants included vaginal discharge, post-coital bleeding, intermenstrual bleeding, lower abdominal pain, and post-menopausal bleeding. These symptoms necessitate vigilant screening and diagnostic procedures to detect potential precancerous conditions or infections early on.[19,23] HPV-related complaints underscore the importance of HPV vaccination and regular screening programs to reduce the incidence of HPV-related diseases.[24] Colposcopy findings among the 104 participants who underwent the procedure showed cervicitis as the most common condition, observed in 62

participants (59.62%). Normal or benign changes were seen in 11 participants (10.58%), ASC/US (Atypical Squamous Cells of Undetermined Significance) in 19 participants (18.27%), ASC/H (Atypical Squamous Cells - cannot exclude HSIL) in 4 participants (3.85%), and LSIL (Low-grade Squamous Intraepithelial Lesion) in 8 participants. Notably, there were no cases of HSIL (High-grade Squamous Intraepithelial Lesion) or AGS (Atypical Glandular Cells). These findings highlight the need for accurate diagnostic tools to avoid unnecessary procedures.[25,29] Histopathological examination of 16 participants with abnormal results diagnosed 11 with CIN I (Cervical Intraepithelial Neoplasia grade I) and 5 with CIN II (Cervical Intraepithelial Neoplasia grade II). These results underscore the importance of histopathological examination in identifying precancerous conditions for early detection and management of cervical abnormalities.[30,31]

The effectiveness of colposcopy in diagnosing conditions confirmed by histopathology was evaluated using sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and accuracy. Colposcopy showed a high sensitivity of 85.71%, indicating its effectiveness in detecting most true positive cases and minimizing false negatives. However, the specificity was moderate at 60%, suggesting a significant rate of false positives. The PPV and NPV were both 75%, reflecting the reliability of colposcopy in confirming the presence and absence of disease. Overall, colposcopy had an accuracy of 75%, indicating its general effectiveness in diagnosing cervical abnormalities.[32] These metrics suggest that while colposcopy is a highly sensitive tool, its moderate specificity indicates the need for refinement to reduce false positive rates. Integrating colposcopy with other diagnostic methods, such as HPV testing and cytology, can improve specificity and provide a more balanced and accurate diagnostic process. This combined approach is essential for enhancing the diagnostic accuracy and ensuring timely and appropriate treatment for cervical abnormalities.[33]

CONCLUSION
The study highlights a significant prevalence of cervicitis and various grades of cervical intraepithelial neoplasia (CIN), emphasizing the importance of regular screenings. Colposcopy shows high sensitivity (85.71%) in detecting true positive cases, but its specificity (60%) indicates a notable rate of false positives. Positive and negative predictive values of 75% each suggest reliability in confirming and ruling out disease. With an overall accuracy of 75%, colposcopy demonstrates moderate effectiveness in diagnosing cervical conditions.

REFERENCES
1. Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, et al. Cancer incidence and mortality worldwide: Sources, methods and major patterns in GLOBOCAN 2012. Int J Cancer., 2015 Mar 9; 136(5).
2. GLOBOCAN. Estimated cancer incidence, mortality and prevalence worldwide, 2012.
3. Human Papillomavirus and Related Diseases Report IRAQ [Internet]. Available from: www.hpvcentre.net
4. N.A. Al Alwan. Colposcopy, cervical cytology and human papillomavirus detection as screening tools for cervical cancer. . EMHJ - Eastern Mediterranean Health Journal, [Internet]. [cited 2024 Jul 1], 2001; 7(1–2): 100–5. Available from: https://iris.who.int/handle/10665/118994
5. WNO. Comprehensive Cervical Cancer Control: A Guide to Essential Practice, 2014.
6. Nessa A, Hussain MA, Rahman JN, Rashid MHU, Muwonge R, Sankaranarayanan R. Screening for cervical neoplasia in Bangladesh using visual inspection with acetic acid. International Journal of Gynecology & Obstetrics, 2010 Nov; 111(2): 115–8.
7. Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, et al. Cancer incidence and mortality worldwide: Sources, methods and major patterns in GLOBOCAN 2012. Int J Cancer, 2015 Mar 9; 136(5).
8. zur Hausen H. Human Papillomaviruses and Their Possible Role in Squamous Cell Carcinomas. In, 1977; 1–30.
9. zur Hausen H. The search for infectious causes of human cancers: Where and why. Virology, 2009 Sep; 392(1): 1–10.
10. Rosenthal AN, Panoskaltsis T, Smith T, Soutter WP. The frequency of significant pathology in women attending a general gynaecological service for postcoital bleeding. BJOG, 2001 Jan 22; 108(1): 103–6.
11. ACOG. Practice Bulletin No. 168: Cervical Cancer Screening and Prevention. Obstetrics & Gynecology,. Obstetrics & Gynecology, 2016 Oct; 128(4): e111–30.
12. Al- Mussawy JJ AFAAAS et al. Impact of age factor in cervical abnormalities and cancer incidence in some Iraqi married women. Iraqi J Biotechnol., 2019; 18: 2019; 18(1): 58-66.
13. Aswathy S, Quereshi MA, Kurian B, Leelamoni K. Cervical cancer screening: Current knowledge & practice among women in a rural population of Kerala, India. Indian J Med Res., 2012 Aug; 136(2): 205–10.
14. Azuh D, Fayomi O, Ajayi, Lady. Socio-Cultural Influence of Gender Roles in Women's Health Care Utilization in South-West Nigeria, 2014.
15. Syndrome AMKPO. Insights into pathogenesis, diagnosis, prognosis, pharmacological and non-pharmacological treatment. Pharmacol Rep., 2016; 1(103): E1.
16. Attia GM, Alharbi OA, Aljohani RM. The Impact of Irregular Menstruation on Health: A Review of the Literature. Cureus, 2023 Nov 20.

17. Shukla S, Ezebuihe JA, Steinert JI. Association between public health emergencies and sexual and reproductive health, gender-based violence, and early marriage among adolescent girls: a rapid review. BMC Public Health, 2023; 23(1): 117.

18. Islam MdA, Khan MdNA, Raihan H, Barna SD. Exploring the Influencing Factors for Contraceptive Use among Women: A Meta-Analysis of Demographic and Health Survey Data from 18 Developing Countries. Int J Reprod Med., 2022 Nov 14; 2022: 1–9.

19. Alenizy HK, AlQahtani MH, Aleban SA, Almuwallad RI, Binsuwaidan LA, Alabdullah DW, et al. Knowledge and Practice Regarding Abnormal Vaginal Discharge Among Adolescent Females in Riyadh City: An Observational Study. Cureus, 2024 Mar 22.

20. Tarney CM, Han J. Postcoital Bleeding: A Review on Etiology, Diagnosis, and Management. Obstet Gynecol Int., 2014; 2014: 1–8.

21. Liu HL, Chen CM, Pai LW, Hwu YJ, Lee HM, Chung YC. Comorbidity profiles among women with postcoital bleeding: a nationwide health insurance database. Arch Gynecol Obstet, 2017 Apr 28; 295(4): 935–41.

22. Sharon Sung; Karen Carlson; Aaron Abramovitz. Postmenopausal Bleeding [Internet]. StatPearls Publishing, 2024. [cited 2024 Jun 18]. Available from:
https://www.ncbi.nlm.nih.gov/books/NBK562188/

23. Xu X, Chen L, Nunez-Smith M, Clark M, Wright JD. Timeliness of diagnostic evaluation for postmenopausal bleeding: A retrospective cohort study using claims data. PLoS One, 2023 Sep 8; 18(9): e0289692.

24. Manini I, Montomoli E. Epidemiology and prevention of Human Papillomavirus. Ann Ig., 2018; 30(4 Supple 1): 28–32.

25. Lusk MJ, Konecny P. Cervicitis: a review. Current Opinion in Internal Medicine, 2008 Apr; 7(2): 142–8.

26. Iqbal U WC. Cervicitis. [Internet]. StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan; 2023. [cited 2024 Jun 18]. Available from:
https://www.ncbi.nlm.nih.gov/books/NBK562193/

27. Long HA, Brooks JM, Maxwell AJ, Peters S, Harvie M, French DP. Healthcare professionals' experiences of caring for women with false-positive screening test results in the National Health Service Breast Screening Programme. Health Expectations, 2024 Apr 21; 27(2).

28. Solomon D, Schiffman M, Tarone R. Comparison of Three Management Strategies for Patients With Atypical Squamous Cells of Undetermined Significance: Baseline Results From a Randomized Trial. JNCI Journal of the National Cancer Institute, 2001 Feb 21; 93(4): 293–9.

29. Katki HA, Schiffman M, Castle PE, Fetterman B, Poitras NE, Lorey T, et al. Five- Year Risks of CIN 3+ and Cervical Cancer Among Women With HPV Testing of ASC-US Pap Results. J Low Genit Tract Dis., 2013 Apr; 17(Supplement 1): S36– 42.

30. Castle PE, Schiffman M, Wheeler CM, Wentzensen N, Gravitt PE. Human Papillomavirus Genotypes in Cervical Intraepithelial Neoplasia Grade 3. Cancer Epidemiology, Biomarkers & Prevention, 2010 Jul 1; 19(7): 1675–81.

31. Saslow D, Solomon D, Lawson HW, Killackey M, Kulasingam SL, Cain J, et al. American Cancer Society, American Society for Colposcopy and Cervical Pathology, and American Society for Clinical Pathology screening guidelines for the prevention and early detection of cervical cancer. CA Cancer J Clin., 2012 May 14; 62(3): 147–72.

32. Basu PS, Sankaranarayanan R, Mandal R, Roy C, Das P, Choudhury D, et al. Visual inspection with acetic acid and cytology in the early detection of cervical neoplasia in Kolkata, India. International Journal of Gynecological Cancer, 2003 Sep; 13(5): 626–32.

33. Gage JC, Ferreccio C, Gonzales M, Arroyo R, Huivın M, Robles SC. Follow-up care of women with an abnormal cytology in a low-resource setting. Cancer Detect Prev., 2003 Jan; 27(6): 466–71.