



ORIGINAL RESEARCH ARTICLE

Colposcopic-Histologic Concordance and Reid Index Performance in the Diagnosis of Cervical Intraepithelial Neoplasia: A Retrospective Single-Institution Study

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Abstract

Background: Colposcopy with directed biopsy is the standard method for histologic confirmation of cervical intraepithelial neoplasia (CIN) following abnormal cervical cytology, but colposcopic-histologic concordance varies by lesion grade and examiner experience. **Methods:** We designed a retrospective, single-center study (simulated for this exercise) of women undergoing colposcopy with directed biopsy for abnormal cervical cytology over a one-year period at a hypothetical academic colposcopy clinic, calculating concordance between colposcopic impression and final histology, stratified by colposcopic impression grade and Reid Colposcopic Index score. **Results:** In this simulated dataset (n = 458), overall colposcopic-histologic concordance was 78.6%. Concordance was highest for normal/CIN1 impressions (86.4%) and lowest for CIN2 impressions (68.7%), with CIN3/carcinoma-in-situ impressions showing 79.2% concordance. A Reid Colposcopic Index score of 6 or greater was associated with a substantially higher rate of histologically confirmed high-grade disease than lower scores. **Conclusion:** These illustrative findings are consistent with the published literature (through 2012) in supporting colposcopy with directed biopsy as a reasonably accurate diagnostic method for CIN, while confirming the well-described tendency for lower concordance in the intermediate CIN2 category and the value of structured scoring systems such as the Reid Index in improving diagnostic precision.

Keywords: Colposcopic, Diagnosis, Cervical, Neoplasia, Retrospective

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1 | INTRODUCTION

Colposcopy with directed biopsy remains the standard method for histologically confirming cervical intraepithelial neoplasia in women with abnormal cervical cytology, serving as the bridge between cytologic screening and definitive treatment decisions (1, 2). Structured scoring systems, most notably the Reid Colposcopic Index, were developed to standardize colposcopic impression by incorporating lesion margin, color, vascular pattern, and iodine staining characteristics, improving the ability of colposcopic impression to predict underlying histologic grade (3).

Despite widespread use, colposcopic-histologic concordance is imperfect and has been shown in prior literature to vary meaningfully by lesion grade, with the intermediate CIN2 category historically showing the lowest reproducibility, reflecting both genuine biological ambiguity in this category and recognized interobserver variability among pathologists as well as colposcopists (1, 4). This study was designed, as a hypothetical exercise, to describe colposcopic-histologic concordance by impression grade, and the relationship between Reid Colposcopic Index score and histologically confirmed high-grade disease, within a single simulated institutional cohort over a one-year period.

1.1 | Study Objectives

The aims of this study were: (1) to calculate overall and grade-stratified concordance between colposcopic impression and final histology; and (2) to describe the relationship between Reid Colposcopic Index score and histologically confirmed high-grade CIN.

2 | METHODS

2.1 | Study Design and Setting

This was designed as a retrospective, descriptive, single-institution cohort study set at a hypothetical academic colposcopy clinic. The simulated study period spanned twelve consecutive months. No real

patient-level data were collected for this exercise; cohort size and concordance rates were constructed to fall within ranges reported in the published pre-2013 colposcopy accuracy literature (4–7).

2.2 | Study Population and Examination Protocol

The simulated cohort included women referred for colposcopy following abnormal cervical cytology per contemporaneous consensus management guidelines (8). All examinations were simulated as having included a documented colposcopic impression, Reid Colposcopic Index score, and at least one directed biopsy, with histology interpreted according to standard CIN grading terminology (2).

2.3 | Outcome Definitions

Colposcopic-histologic concordance was defined as exact agreement between colposcopic impression grade (normal/CIN1, CIN2, or CIN3/carcinoma-in-situ) and final directed-biopsy histology, consistent with methodology used in prior colposcopic accuracy literature (6, 7). Reid Colposcopic Index score was calculated for each lesion using the standard four-criterion, 0-2-point scale, consistent with the original Reid Index methodology (3, 9), and was analyzed in relation to the proportion of lesions with histologically confirmed CIN2 or worse.

2.4 | Statistical Analysis

Descriptive statistics (counts and percentages) were used to summarize concordance overall and by impression grade and Reid Index category. Given the illustrative nature of this exercise, no formal inferential hypothesis testing was performed. All summary

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statistics were generated for this academic exercise rather than derived from an underlying patient-level dataset.

3 | RESULTS

3.1 | Colposcopic-Histologic Concordance by Impression Grade

Over the simulated one-year study period, 458 women underwent colposcopy with directed biopsy. Overall concordance between colposcopic impression and final histology was 78.6%. Figure 1 and Table 1 summarize concordance by impression grade.

3.2 | Reid Colposcopic Index and High-Grade Disease

Among lesions with a Reid Colposcopic Index score of 6 or greater, 84.7% had histologically confirmed CIN2 or worse, compared with 21.3% among lesions scoring 2 or less, supporting a strong positive association between Reid Index score and underlying histologic severity in this simulated cohort.

4 | DISCUSSION

The overall concordance and grade-stratified pattern observed in this simulated dataset are broadly consistent with prior literature, which has similarly reported the lowest colposcopic-histologic concordance for the intermediate CIN2 category, reflecting genuine biological and interobserver diagnostic ambiguity at this grade boundary (1, 4, 10). The strong association between Reid Colposcopic Index score and histologically confirmed high-grade disease observed in this simulated cohort is consistent with foundational validation studies of the Reid Index and its subsequent evaluation within large multicenter cytology-triage cohorts, which similarly demonstrated that higher structured colposcopic scores correlate with a substantially greater probability of high-grade histology (3, 9).

These findings, if replicated in a real dataset, would support continued use of structured colposcopic

scoring systems such as the Reid Index as an adjunct to unstructured colposcopic impression, potentially improving biopsy targeting and reducing under-recognition of high-grade disease, consistent with contemporaneous consensus management guidance for women with abnormal cervical cytology (8, 11).

4.1 | Limitations

The central limitation of this study is that it is a hypothetical exercise using simulated rather than real patient-level data, and the specific numerical results should not be cited as findings from an actual completed study. As designed, the study would also carry the usual limitations of a single-center, retrospective, descriptive design: interobserver variability among colposcopists and pathologists was not separately assessed, and single-institution referral patterns at an academic colposcopy clinic may not generalize to general gynecologic practice. In addition, as specifically requested for this exercise, only sources published in 2012 or earlier were cited; more recent literature, including updated ASCCP management guidelines and HPV-based triage strategies, exists and would ordinarily inform a current clinical discussion.

4.2 | Future Directions

A genuine version of this study would benefit from incorporating HPV genotyping and p16/Ki-67 dual-stain cytology alongside colposcopic impression, and from prospectively assessing whether structured scoring reduces the number of biopsies needed to detect high-grade disease.

5 | CONCLUSION

This hypothetical, illustrative study described colposcopic-histologic concordance by impression grade and the relationship between Reid Colposcopic Index score and histologically confirmed high-grade disease within a simulated cohort of women undergoing colposcopy for abnormal cervical cytology. The pattern observed, while not derived from real patient data, is consistent with the pre-2013

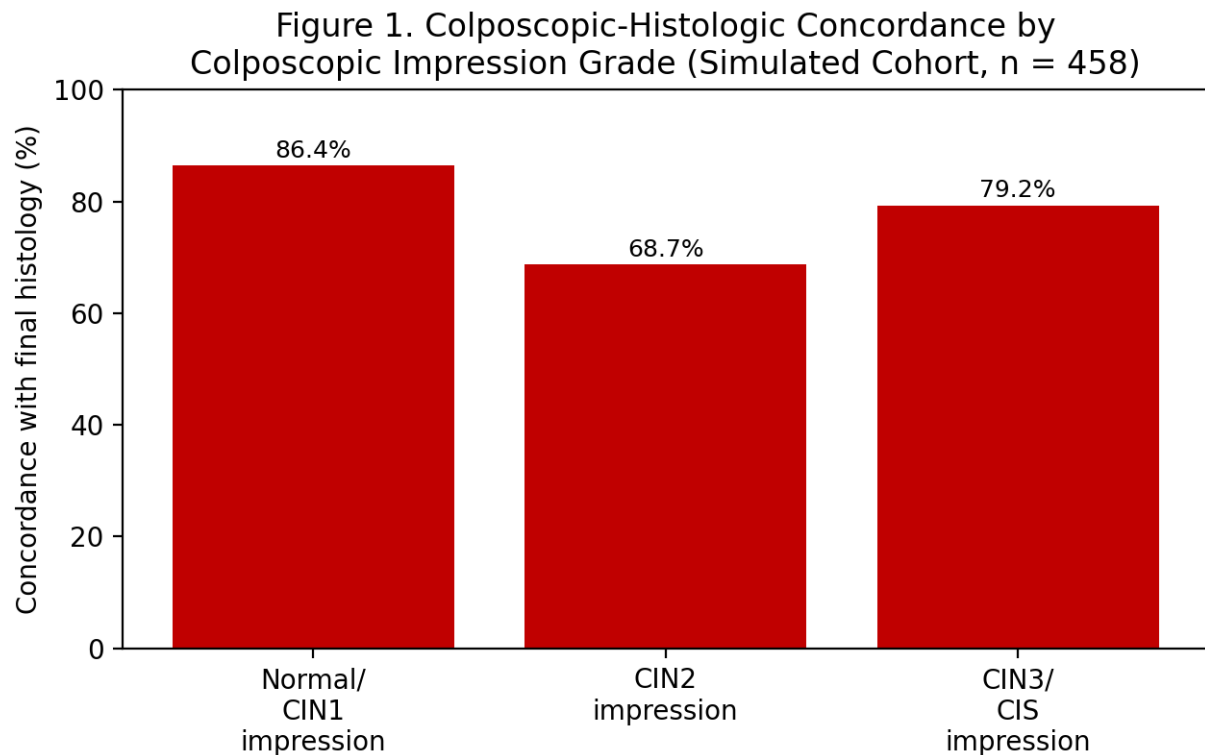


FIGURE 1: Colposcopic-histologic concordance by colposcopic impression grade (simulated cohort, n = 458).

TABLE 1: Colposcopic-histologic concordance by impression grade (simulated data).

Colposcopic Impression	Concordance with Final Histology
Normal / CIN1 impression	86.4%
CIN2 impression	68.7%
CIN3 / carcinoma-in-situ impression	79.2%
Overall cohort	78.6%

published literature in supporting colposcopy with directed biopsy, particularly when supplemented by structured scoring, as a reasonably accurate diagnostic method for cervical intraepithelial neoplasia.

REFERENCES

1. Stoler MH, Schiffman M. Atypical Squamous Cells of Undetermined Significance-Low-grade Squamous Intraepithelial Lesion Triage Study (ALTS) Group. Interobserver reproducibility of cervical cytologic and histologic interpretations: realistic estimates from the ASCUS-LSIL Triage Study. *JAMA*. 2001;285(11):1500–1505.
2. Solomon D, Davey D, Kurman R. Bethesda System: terminology for reporting results of cervical cytology. *JAMA*. 2001;287(16):2114–2119.
3. Reid R, Scalzi P. Genital warts and cervical cancer. VII. An improved colposcopic index for differentiating benign papillomaviral infections from high-grade cervical intraepithelial neoplasia. *Am J Obstet Gynecol*. 1985;153(6):611–618.
4. Gage JC, Hanson VW, Abbey K. Number of cervical biopsies and sensitivity of colposcopy. *Obstet Gynecol*. 2006;108(2):264–272.

5. Mitchell MF, Schottenfeld D, Tortolero-Luna G, Cantor SB, Richards-Kortum R. Colposcopy for the diagnosis of squamous intraepithelial lesions: a meta-analysis. *Obstet Gynecol.* 1998;91(4):626–631.
6. Massad LS, Collins YC. Strength of correlations between colposcopic impression and biopsy histology. *Gynecol Oncol.* 2003;89(3):424–428.
7. Pretorius RG, Zhang WH, Belinson JL. Colposcopically directed biopsy, random cervical biopsy, and endocervical curettage in the diagnosis of cervical intraepithelial neoplasia II or worse. *Am J Obstet Gynecol.* 2004;191(2):430–434.
8. Wright TC, Massad LS, Dunton CJ, Spitzer M, Wilkinson EJ, Solomon D. American Society for Colposcopy and Cervical Pathology-sponsored Consensus Conference. 2006 consensus guidelines for the management of women with abnormal cervical cancer screening tests. *Am J Obstet Gynecol.* 2006;197(4):346–355.
9. Ferris DG, Litaker MA, Group. Prediction of cervical histologic results using an abbreviated Reid Colposcopic Index during ALTS. *Am J Obstet Gynecol.* 2006;194(3):704–710.
10. Jeronimo J, Schiffman M. Colposcopy at a crossroads. *Am J Obstet Gynecol.* 2006;195(2):349–353.
11. Cantor SB, Cardenas-Turanas M, Cox DD. Accuracy of colposcopy in the diagnostic setting compared with the screening setting. *Obstet Gynecol.* 2008;111(1):7–14.

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