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Eureka Journal of Health Sciences & Medical Innovation (EJHSMI)

ISSN 2760-4942 (Online) Volume 2, Issue 8, August 2026

https://eurekaoa.com/index.php/5

CORRELATION OF TWO COLPOSCOPIC INDICES FOR PREDICTING PREMALIGNANT LESION OF THE CERVIX

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Abstract

Background: Cervical cancer is #4 when it comes to female cancers. Globally, incidence and mortality rates are driven by screening programs for cervical precancer and cancer, and by human papillomavirus (HPV) vaccine. The use of grading systems makes colposcopy a lot more accurate. The most commonly utilised systems are the Reid Colposcopic Index (RCI) and the Swede score. **Objective:** Two colposcopic indices for prediction of premalignant lesion of cervix: How strong they are?

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Patient and Methods: This cross-sectional study included 60 women with a clinical suspicion of cervical lesions. The study was carried out in the department of obstetrics and gynaecology in Baghdad teaching hospital for a period of one calendar year from February 2019 to January 2020. Histopathology was compared with Reid's colposcopic index and the swede score after each patient had colposcopic examination and colposcopically directed biopsy.

Results: Most of the women in this study (43.3%) were in the 40 to 49 age groups, and the mean age of the 60 women was 39.7 ± 7.7 years. The most common presenting sign was abnormal pap smear (71.7%). There was a sufficiently strong association between RCI and swede score ($r = 0.708$, p-value <0.001). Of the 50 patients, low-grade lesions were observed in 83.3% and high-grade lesions in 10.7%. The connection of RCI with Swede score was high and statistically significant (kappa of Cohen between 0.61 and 0.8). Higher RCI and swede scores are associated with higher histopathology grades, with high-grade lesions showing significantly higher mean values than low-grade lesions.

Conclusion: We were able to assess the cervical lesions by both procedures, thus both methods are effective. Alternatively, we may assume that these scores are valid for Iraqi women and make colposcopy easier.

Aim :1. Assess the reliability of two colposcopic indices in detecting cervix premalignant lesions. 2. Determine which score is more practical in practice

Keywords: premalignant, colposcopic, cervix, Cervical cancer, human papillomavirus (HPV).

Introduction

Background Cervical cancer ranks as the fourth most prevalent malignancy among women. In 2018, approximately 570,000 women globally were diagnosed with cervical cancer, leading to 311,000 fatalities from the illness. In 2018, around 570,000 women globally were diagnosed with cervical cancer, resulting in

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311,000 fatalities from the illness. Cervical cancer exhibits a reduced occurrence and mortality rate compared to various other cancers, such as those affecting the uterine corpus and ovaries. Nonetheless, cervical cancer continues to be a predominant factor in cancer-related morbidity and mortality in nations without screening and preventive measures. Cervical neoplasia and nearly all (99.7 percent) cervical malignancies The human papillomavirus (HPV) is responsible for cervical neoplasia and nearly all (99.7 percent) cases of cervical cancer. by the human papillomavirus (HPV) (3). Cervical cancer is comprised of 70% squamous cell carcinoma and 25% adenocarcinoma (4). Health promotion incidence and mortality statistics Cervical cancer ranked as the second most prevalent cancer with an incidence of 15.7 per 100,000 women and the third leading cause of cancer-related deaths at 8.3 per 100,000 in developing nations. The significance of health screenings Access to screening initiatives and human papillomavirus (HPV) immunization, which is more prevalent in developed nations, influences the occurrence and mortality of cervical cancer (6, 7). These initiatives have led to a 75% reduction in cervical cancer incidence in these nations over the last fifty years (6, 7). Age-related distribution The subsequent (8) risks had amassed concerning the progression and fatality of cervical cancer by the age of 74: The prevalence in industrialized nations was 0.9%, while the fatality rate was 0.3%. - Emerging nations (incidence: 1.6%, fatality rate: 0.9%). Cautionary indicators exist among several prevalent risk factors during the preinvasive phases of the two primary histological types of cervical cancer, namely squamous cell carcinoma and adenocarcinoma. Infection with the human papillomavirus (HPV) is responsible for nearly all cases of cervical cancer. Certain risk determinants for HPV-associated malignancies encompass: 1. Initiating sexual activity at an early age increases the risk by 1.5 times for individuals aged 18-20 and by 2 times for those under 18 compared to those who commence sexual relations at 21 or older. Two sexual partners increase the risk twofold, while six or more partners elevate the risk threefold. A sexual partner

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with a high risk profile, such as one who is known to have multiple partners or to be infected with HPV. 4. Record of prior sexually transmitted disease infections (e.g., genital herpes or Chlamydia trachomatis). The likelihood of early parenthood (under 20 years) and experiencing multiple full-term pregnancies (three or more) is likely attributable to sexual exposure to HPV. 6. A recorded history of squamous intraepithelial neoplasia or carcinoma affecting the vulva or vagina, predominantly linked to HPV infection. 7. Immune system suppression (for instance, HIV) Women residing in economically disadvantaged areas exhibit elevated rates of incidence and mortality from cervical cancer compared to those in affluent regions. This is likely attributable to inadequate access to healthcare and screening initiatives in these populations (11). Cervical cancer estimates are elevated across all racial demographics, with non-Hispanic Black women exhibiting the highest incidence and mortality rates. The utilization of oral contraceptives: a meta-analysis encompassing 24 epidemiological studies revealed that the likelihood of invasive cervical cancer escalated with prolonged usage among current oral contraceptive users. The risk diminished following cessation of use and resembled that of non-users after a decade or more. Cigarette consumption elevates the likelihood of developing squamous cell carcinoma of the cervix, but not adenocarcinoma (10).

Table 1.1: Human papillomavirus: High- and low-risk types for causing cervical cancer [23]

High-risk (oncogenic or cancer-associated) types
Common types: 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68, 69, 82
Low-risk (non-oncogenic) types
Common types: 6, 11, 40, 42, 43, 44, 54, 61, 72, 81

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Factors associated with persistence of HPV:

- Older age – 50 percent of high-risk HPV infections persist in patients older than 55 years of age compared with a 20 percent rate of persistence in patients under age 25 [33].
- Duration of infection – The longer an HPV infection has been recognized, the longer it will take to clear [22].
- High oncogenic HPV subtype – High-oncogenic-risk HPV subtypes are more likely to persist than low oncogenic types [34].

Sexual transmission

HPV is transmitted through sexual contact. Cervical cancer and its precursors are almost nonexistent in patients who have not had any sexual relationships [35]. HPV infection is endemic among sex workers. The risk correlates with the lifetime number of sex partners but is relatively high (4 to 20 percent) even in those with one partner. At least (75 to 80 percent) of sexually active patients will have acquired a genital HPV infection by age 50. HPV infection of the cervix or lower female genital tract is asymptomatic and is only clinically apparent if genital warts or neoplastic lesions develop [36].

Nonsexual transmission

Infection by nonsexual contact, autoinoculation, or fomite transfer appears possible. This is supported by reports of non-genital HPV types in a significant minority of pediatric and adolescent genital wart cases [37].

Congenital HPV infection from vertical transmission (mother to fetus/newborn) beyond common, transient skin colonization is rare. Conjunctival, laryngeal, vulvar, or peri-anal warts that are present at birth or that develop within 1 to 3 years of birth are most likely due to perinatal exposure to maternal HPV Infection is not linked to presence of maternal genital warts or route of delivery, Accordingly, cesarean delivery is not recommended solely for maternal HPV

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infection. Exceptions include cases of large genital warts that could obstruct delivery or avulse and bleed with cervical dilation or vaginal delivery [38].

Anatomy Uterine cervix

The cervix is a tubular structure that serves as the conduit between the endometrial cavity and the vagina. The superior portion is continuous with the uterus [39].

The inferior portion of the cervix protrudes into the vagina. In some women (eg, postmenopausal, following pelvic radiation), the cervix may appear flush with the vagina on examination rather than protruding [39].

The cervical canal opens into the endometrial cavity at the internal os and the vagina at the external os. The ectocervix is the surface of the cervix that protrudes into the vagina [39].

The cervix is composed of dense fibrous connective tissue with a minimal amount of smooth muscle located on the periphery that forms a continuous layer between the myometrium and the muscle in the vaginal wall [39].

Squamocolumnar Junction

During embryogenesis, upward migration of stratified squamous epithelium from the urogenital sinus is thought to replace mullerian epithelium. This process usually terminates near the external cervical os, forming the original (congenital) squamocolumnar junction (SCJ) [40].

When visible on the ectocervix, the SCJ is seen as a pink. smooth, squamous epithelium juxtaposed against the red, velvety, columnar epithelium surrounding the external cervical os. Rarely this migration is incomplete, and the SCJ forms in the upper vaginal fornixes. The columnar epithelium is commonly referred to as “glandular” It does produce mucus, and its deep in folding appear histologically similar to glandular tissue. However, true glands, which consist of acini and ducts, are not present on the cervix [40].

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The location of the SCJ varies with age and hormonal status. During the reproductive years, it everts outward onto the ectocervix in response to estrogen (especially during adolescence, pregnancy, and combination hormonal contraceptive use). It regresses into the endocervical canal with the process of squamous metaplasia and low-estrogen states like menopause, lactation, and progestin-only contraceptive use [40].

Squamous Metaplasia

At puberty, the rise in estrogen levels leads to greater glycogen formation within nonkeratinized cervical and vaginal squamous epithelia. In providing a carbohydrate source, glycogen allows vaginal flora to be dominated by lactobacilli, which produce lactic acid. The resultant acidic vaginal pH is the suspected [41].

Stimulus for squamous metaplasia, which is the normal replacement of columnar by squamous epithelium on the cervix. Undifferentiated reserve cells underlying the SCJ are the likely precursor of the new metaplastic cells, which differentiate further into squamous epithelium. This normal process creates a progressively widening band of newer metaplastic and maturing squamous epithelium that lies between the original squamous epithelium and the columnar epithelium and is termed the transformation zone (TZ) [41].

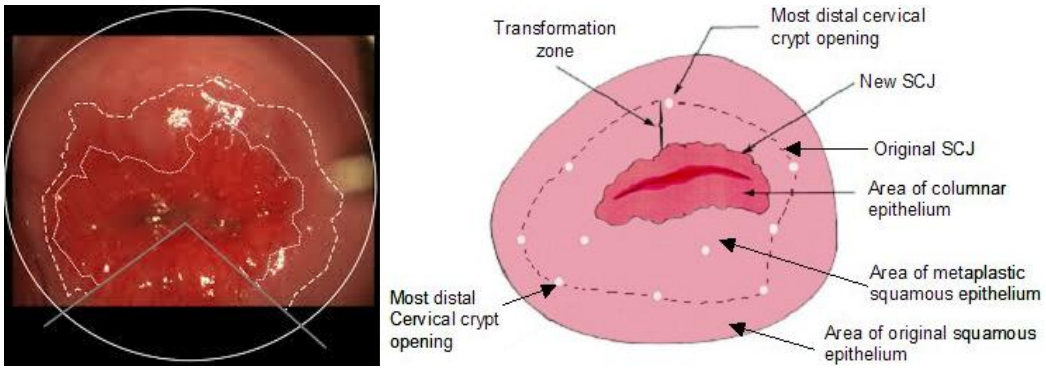

Figure 1.4: topographical presentation of the cervix [41]

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Patient and Methods:

This cross-sectional study involved women with a clinical suspicion of cervical lesions.

The RCI and Swede scores were compared with cervical histopathology. Cervical pathology was obtained via colposcopically directed biopsy. All findings were separated into two categories for comparison:

1. Damaged or low-grade inflammation
2. a high-grade lesion

2.2 Study Setting Lesions of CIN1 (low grade) and lesions of CIN2 (high grade) were included.

This study was conducted in the period from February 2019 until the end of January 2020 in the gynecological oncology clinic and department of obstetrics and gynecology, Baghdad Teaching Hospital.

Ethical factors

The study was approved by the scientific council of the obstetrics and gynecology specialization of the Arabic Board of Medical Specializations. The study was conducted in accordance with the Helsinki Declaration criteria for clinical trials, which require telling participants about the aim of the study and any related procedures or tests before allowing them to decide whether to participate or not. Verbal consent was obtained from all subjects before the trial. All research data were kept confidential to protect the privacy and independence of the participants.

Data collection from the participants

The investigation was performed on 60 women who met the inclusion and exclusion criteria.

Criteria for inclusion

Age range: 20-60

• Bleeding post-sex

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Your pap smear is not normal.
• Bleeding from the vagina
• A cervical tumor that appears bad (suspicious lesion, bleeds on contact, ulcer, erosion, etc.)

Exclusion Criteria
• Cervical history (including excisional biopsy, cryotherapy, and cone biopsy).
• Substantial growth.
• Colposcopy normal.
2.7 ZEISS Optimi® Pico Colposcopy System

Clinical Assessment
Once the indication of colposcopy has been established and consent acquired. The patient was told what was going to happen. We may obtain relevant medical documentation and medical history.
Previous acts, including:
- The gynaecological and obstetrical history given in the first appendix.

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- Lower genital tract medical history includes pap test, HPV infection, genital warts, and results of cervical, vulvar, or vaginal biopsies.
- Immune-depressing conditions: corticosteroids, chemo, autoimmune diseases, transplant history, cancer, and inherited or acquired immune deficiencies.
"Smoking" (tobacco use)
- Recent history of vaginal medication use or sexual activity is included.
Patients on anticoagulant medication, with bleeding problems, or with an iodine allergy will be unable to have the procedure.

Methodology:
The patient is positioned in the routine dorsal lithotomy position, lying on his back with his legs in stirrups and his buttocks at the edge of the table.
The vulva is visually examined for any irregularities that may need further research to assess the need for a biopsy or colposcopic evaluation.

Simultaneous view of both hands:
First, if you have cervical swelling or fixation (which could be a sign of malignancy) or pelvic pain (which could be a sign of infection of the vaginal system), you should have a colposcopy.

Examine the speculum:
For the optimal inspection of the cervix, a bivalve speculum (Cusco's speculum) was introduced into the vagina. The patient was requested to use the widest speculum that could be accommodated so that the whole cervix and vaginal fornices could be seen.

The examination found
The cervix and vagina are first examined under a bright light for gross visibility with no solutions being used.

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Saline-soaked cotton was used to cleanse the cervix of any blockages such as mucus, blood, discharge, or debris.

When the colposcopy was adequate, all 4 corners of the cervix were seen, and the distal and proximal borders of the transformation zone identified, the following findings were defined: erosion, ulceration, leukoplakia, pigmented lesions, and exophytic growth. If the transformation zone could not be seen, a Kogan endocervical speculum was used to dilate the cervical canal.

Acetic acid

This mucolytic solution, delivered to the wound with a cotton swab, has aceto-whitening effects that are apparent 30 to 60 seconds after application. The squamous cells with large or dense nuclei reflect light and look white because the acidic acid solution dehydrates the cells. 'Acetowhite change' is the white area under consideration for biopsy.

Distribution in arteries

Aberrant vascular patterns such as punctuation, mosaicism, and atypical arteries can be recognized using the red-free (green filter) technique.

There are two basic factors for ranking the punctate and mosaic patterns, which are the consistency and the size of the vessels. Low-grade lesions are marked by small veins and capillaries, mosaicism, and small holes in the skin.

When the vessels are large and irregular, it creates a coarse pattern, indicating serious trouble. Atypical vessels with irregularity in diameter, shape, course, and arrangement suggestive of invasive cancer.

Schiller Assessment

Detection was aided by the use of a diluted Lugol's solution on the cervix. Lugol's iodine is made from 5 grams of iodine and 10 grams of potassium iodide dissolved

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in 100 milliliters of distilled water. If the stain is taken up evenly, then the colposcopist's original suspicion of no lesion would be confirmed.

Lugol's iodine solution stains mature glycogen-rich squamous epithelium dark brown in women of reproductive age with normal serum estrogen levels.

Dysplastic epithelium contains less glycogen content, stains poorly, and appears yellow in color because of poor maturation. The administration of Lugol's iodine is highly effective when aberrant tissue is not identified using acetic acid. This approach is typically used to outline the limits of the active TZ, because the adult squamous epithelium stains more intensely than the juvenile squamous metaplasia cells, which lack glycogen.

Assessment of lesion size

Before the biopsy, the lesion size is estimated with the 3 mm tip of the kevorkian forceps. The locations of the anomalies are designated as they appear on the clock face, for example, 2:00 or 10:00.

Colposcopic Assessment and Scoring

The symptoms noted on the colonoscopy The evaluation results recorded in Appendix I were based on scores obtained from the colposcopic examination using the modified RCI and the Swede score.

Biopsy

The abnormal region was biopsied using the Kevorkian cervical biopsy forceps with a bite size of 8X3 mm. The biopsies were taken in the best possible order to prevent bleeding obscuring the other biopsy sites, from posterior to anterior.

To maximize sensitivity, two to four biopsies of abnormalities should be obtained and stored in a conservative solution. Samples should be tagged with the patient's name and date before being sent to the Histopathology Department or Teaching Laboratories at Medical City for histopathological investigation.

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The lateral fornices and upper third of the vagina are examined after the cervix has been examined.
If the bleeding is little, you can apply continuous pressure with a cotton swab. If the bleeding is heavy, you can use a vaginal pack.

The Policies

We recommend refraining from sexual intercourse for the first 48 hours after cervical biopsies to avoid the risk of bleeding due to stress on the cervix. Patients are given verbal instructions on how to obtain their results.

Data statistical analyses

The median and interquartile range (25–75% percentile range) will be used to present the data if the continuous variable is not normally distributed and the mean and standard deviation if it is. The Anderson-Darling test was used to decide the distribution. Numbers and percentages represent discrete variables.
In order to establish the nature of the correlations between the variables, linear regression analysis was performed. Regression analysis is shown in the scatter plot. The strength and direction of the link are described using a correlation coefficient or a standardized beta. A number of 0.00-0.29 indicates little or no connection; 0.30-0.49 suggests weak correlation; 0.50-0.69 indicates moderate correlation; 0.70-0.89 indicates strong correlation; and 0.90-1.00 indicates very strong correlation. A positive sign indicates that there is a direct association, whereas a negative sign indicates that there is an inverse relationship. Results are presented as kappa (k) values between -1 and +1. Kappa values of 0.40-0.59 are generally considered moderate, 0.60-0.79 are substantial, and 0.80 is excellent. This was performed using Cohen's kappa analysis of agreement, which estimates the probability of agreement or disagreement and the magnitude of agreement for two discrete variables.

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The sensitivity (or true positive rate) is displayed as a function of the specificity (or false positive rate) for different cut-off points on a receiver operating characteristic (ROC) curve. Each point on the ROC curve corresponds to a pair of sensitivity and specificity at a certain decision threshold. A ROC curve that passes through the upper left corner (100% sensitivity, 100% specificity) represents a test that perfectly discriminates, i.e., no overlap in the two distributions. The distance of a test from the upper left corner of the ROC curve is indicative of the overall accuracy of the test.

The statistical software utilized was SPSS 22.0.0 (Chicago, IL) and MedCalc 14.8.1 (Ostend, Belgium; MedCalc Software bvba) in 2014. A p-value <0.05 was judged significant.

Results:

The present study included 60 women, with a mean age of 39.7 ± 7.7 years, the majority of the women were in age groups 40 – 49 years (43.3%). The rest of the demographic data presented in table 2.1

Table 2.1: assessment of demographical data

Variable		Value
Number		60
Age (years), mean ± SD		39.7 ± 7.7
Age groups, n (%)		
20 – 29 years		6 (10%)
30 – 39 years		24 (40%)
40 – 49 years		26 (43.3%)
≥50 years		4 (6.7%)
Parity	**Nulliparity**	13 (21.7%)
	Multiparity	47 (78.3%)
Low income, n (%)		48 (80%)
Smoker, n (%)		7 (11.7%)
COC, n (%)		19 (31.7%)

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The details of the indications are illustrated in table 2.2, in summary, the most common indication was abnormal pap smear (71.7%).

Table 2.2: indications of colposcopy

Indication	N, (%)
Cytological indications	
Abnormal pap smear	43 (71.7%)
Clinical indications	
Unhealthy looking cervix	10 (16.7%)
Persistence discharge	4 (6.7%)
Post coital bleeding	3 (5%)

There was a highly significant correlation between RCI and swede score, r = 0.708 with p-value <0.001, as illustrated in figure 2.1

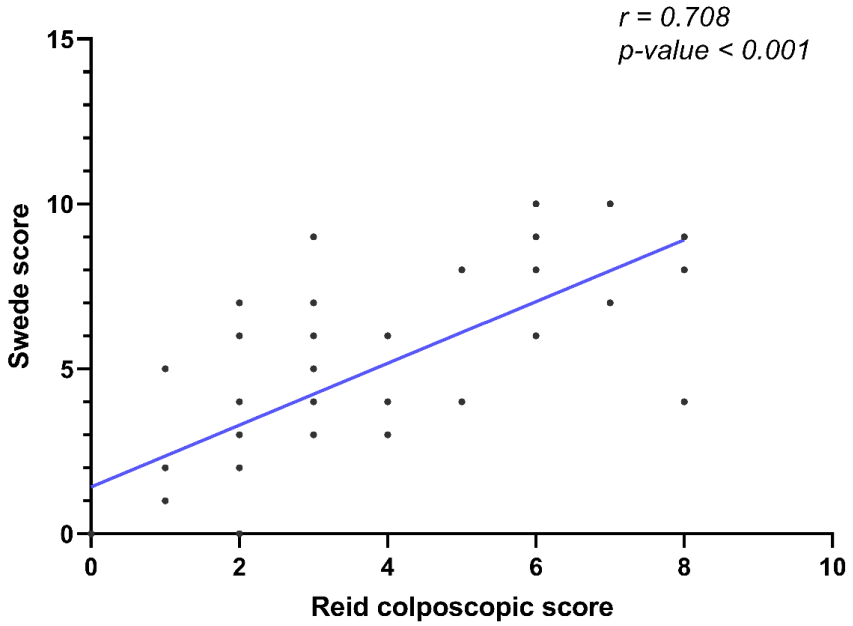

Figure 2.1: correlation between swede score and Reid colposcopic score

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There was substantial agreement (since kappa between 0.61 – 0.8) between both RCI and Swede score and it was significant (as illustrated in table 2.4)

Table 2.4: assessment of agreement level between RCI and Swede score

RCI	Swede score		Kappa	p-value
	<8 (n=51)	≥8 (n=9)		
<5 (n=46)	45	1	0.618	<0.001
≥5 (n=14)	6	8		

In the present study, 10 patients (16.7%) had high-grade lesions, while 50 patients (83.3%) had low-grade lesions, as illustrated in figure 2.2

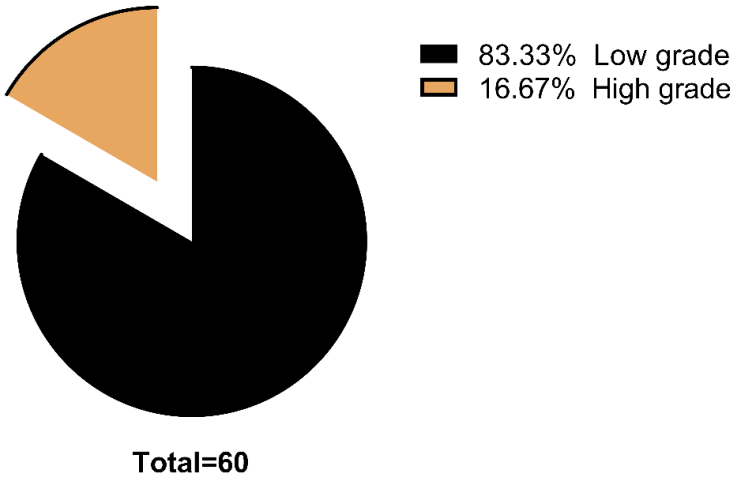

Figure 2.2: pie-chart of the histopathological findings

The mean value of both RCI and swede scores was significantly higher in high-grade lesions compared to low-grade lesions, which mean the higher the lesion was scored the higher grade of histopathology result was obtained, as illustrated in table 2.3.

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Table 2.3: assessment of the numerical mean value of various scores according to histopathological findings

	Low grade	High grade	p-value
Number	50	10	-
RCI	2.34 ± 1.48	6.2 ± 1.32	<0.001
Swede score	3.4 ± 2.11	8.3 ± 1.25	<0.001

It appears that RCI overestimates high-grade lesions, in which RCI score with value ≥5 were 14 cases from these 14 cases 9 cases were high grade according to histopathology indicating overestimation of high-grade lesions, with a substantial agreement with histopathological findings, and there is 1 high grade lesion missed by RCI and scored <5, while its histopathological result show high grade lesion (see table 2.5).

Table 2.5: assessment of agreement level between RCI and histopathological findings

RCI	Histopathology		Kappa	p-value
	Low grade (50)	High grade (10)		
<5 (n=46)	45	1	0.690	<0.001
≥5 (n=14)	5	9		

Swede score had a lower tendency to over-estimate (1/9) compared to RCI since 9 cases had Swede score ≥8 with only one case appeared to have low-grade lesions in histopathology, with an almost perfect agreement with pathological findings, but two cases with high grade histopathological result was missed by Swede and scored <8 (see table 2.6)

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Table 2.6: assessment of agreement level between Swede score and histopathological findings

Swede score	Histopathology		Kappa	p-value
	Low grade (50)	High grade (10)		
<8 (n=51)	49	2	0.812	<0.001
≥8 (n=9)	1	8		

Both scores showed excellent to predict high-grade lesions, as illustrated in table 2.7 and figure 2.3.

This table show excellent prediction to establish high grade lesion from low grade lesion (as the value of AUC is between 0.9-1), with slightly higher AUC for swede than RCI, perhaps indicate slightly better result.

Table 2.7: assessment of the diagnostic performance of both diagnostic tests for high-grade lesions

Scores	AUC	p-value
RCI	0.959	<0.001
Swede score	0.969	<0.001
AUC: area under the curve		

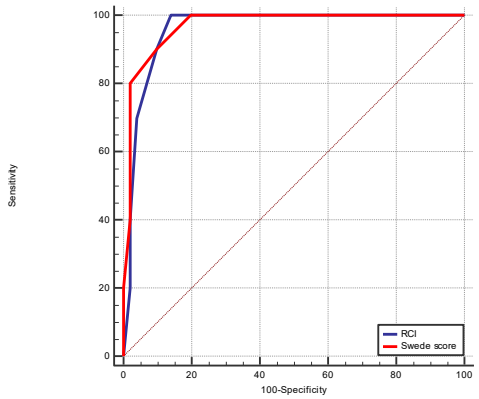

Figure 2.3: ROC curve for both RCI and Swede score to predict high-grade lesions

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RCI score showed higher specificity compared to its sensitivity, which also reflected in its higher PPV compared to its NPV, a similar finding shared by Swede score, as illustrated in table 2.8.

2.8 assessment of the diagnostic performance of selected criteria for both scores

Scores	Criteria	SN	SP	AC	PPV	NPV
RCI	>5	70	96	91.7	94.1	77.8
Swede score	>8	40	98	88.3	89.1	80
SN: sensitivity, SP: specificity, AC: accuracy, PPV: positive predictive value, NPV: negative predictive value						

As there is 3 cases missed , one by RCI (scored <5) and two swede (scored <8) and they were high grade lesion by histopathological study, in this study we tried to find the cut of value at which no such lesion can be missed, **Table 2.9** show an improvement in sensitivity to 100% for both RCI and Swede when lower criteria is used (RCI >3,Swede score >5) despite reduction in specificity, and increase the NPP to 100% for both score despite reduction in PPV.

Table 2.9: assessment of the performance of optimal cut off of both scores for assessing high-grade lesions.

Scores	Criteria	SN	SP	AC	PPV	NPV
RCI	>3	100	86	88.3	58.8	100
Swede score	>5	100	80	83.3	50	100
SN: sensitivity, SP: specificity, AC: accuracy, PPV: positive predictive value, NPV: negative predictive value						

Discussion

Colposcopy is a visual examination that requires the skills of a colposcopist. Assessment of colposcopic findings of cervical lesions is operator-specific. Hence, colposcopic scoring methods provide more objective and accurate

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assessments (57). The women in our sample ranged in age from 20 to 60 years with a mean age of 39.7 years; 47 were multiparous; 48 were from low-income groups; most were non-smokers, and 19 utilized COC. The commonest indication for referral to colposcopy was abnormal pap smears, which occurred in 43 cases. In the present study, the RCI and the Swedish score were shown to correlate strongly with each other, indicating a good alignment of the two scores. This is in agreement with previous studies, e.g., C. Suwanthananon and P. Inthasorn (2020), who investigated the diagnostic accuracy of both scores in 159 Thai women with abnormal pap smears and diagnostic colposcopy. The researchers found that the two scores were strongly correlated, with a correlation coefficient of 0.986 (61). Our findings, which revealed a very clear and statistically significant correlation between the two scores (r = 0.919; 57), were congruent with the results of a prospective study in India in 2017 by Ranga et al. in 150 women with suspicious lesions. The test of agreement (Kappa) showed that the Swedish score and the pathological report agreed better (0.812 vs 0.690) than the RCI and the pathological report.

Both ratings showed excellent predictive ability for high-grade lesions (AUC ≥0.9) in this study. These findings are in agreement with previous studies by writers such as C. Suwanthananon and P. Inthasorn, who obtained an area under the curve (AUC) of 0.906 for RCI and 0.902 for the Swedish score (61). The AUC for each score was ≥0.9 in our study, similar to the study by Ranga et al. (57) in 2017. Our investigation showed that the SWEDE score had lower sensitivity (80%), specificity (98%), AC (92), PPV (96.1%), and NPV (88.9%) than the RCI (90%) and swede score (97.8%). These findings were in agreement with the results of a prospective study conducted in India in 2017 by Ranga et al. on 150 women with suspicious lesions, which demonstrated a very direct and statistically significant correlation between the two scores (r = 0.919; 57). The AUC value of the SWEDE score was somewhat higher than that of RCI, which would suggest slightly better results, yet both scores showed excellent ability in predicting high-

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grade lesions in the present study (as AUC ≥ 0.9). And if we look at the sensitivity of the two scores (using 5 and 8 as cut-offs for assessing pathological lesions, respectively), we can see that the specificity is significantly larger. Our results are partially consistent with previous studies; for example, C. Suwanthananon and P. Inthasorn reported an AUC of 0.906 for the RCI and 0.902 for the swede score, respectively. Also, the sensitivity of RCI was less than the above studies, but its specificity was more. The PPV, NPV, and accuracy were 75.0%, 93.7%, and 88.1%, respectively. This result is in line with our findings for specificity. The swede score was also found to have a sensitivity of 88.4%, specificity of 87.1%, PPV of 71.7%, NPV of 95.3%, and accuracy of 87.4% (61).

Our study had similar results with an AUC of 0.9 or better for all scores as reported by Ranga et al. (2017). In terms of SN and SP, the RCI was 96.97% sensitive and 95.35% specific, the PPV was 88.89%, and the NPV was 98.8%, similar in SP but disagreed in SN. The results for the SWEDE score (cutoff 8) are similar to ours: sensitivity 42.42%, specificity 100%, PPV 100%, and NPV 81.9% (57). In diagnostics both scores performed equally, but the present study found that RCI was easier to use than the Swedish score. First, Carriero et al. (62) showed that RCI performed better than the International Federation for Colposcopy and Cervical Pathology grading system. The Swedish score created by Strander et al. was very effective in recognizing high-grade lesions (63). RCI includes acetowhite lesions, edges, vessels, and iodine stains. Kierkegaard et al. suggest adding the size of the lesion in the grading system due to its predictive significance. Then, the lesion size was incorporated into the four prognostic indicators of RCI by the Swedish scoring system (63).

Our results and the linked research suggest that the addition of lesion size to the diagnostic preference marginally improves accuracy (not statistically significant), but it also complicates the scoring system, which will make it less useful in clinical practice and less reliable overall.

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We found decreased specificity (86% vs. 96% and 80% vs. 98%, respectively) and higher sensitivity (100% vs. 40% and 100% vs. 70%, respectively). So the new criteria, RCI (>3) and Swede score (>5), are better screening tests, and the original criteria will still be relevant as confirming tests. Here we found that the higher the sensitivity of the RCI and Swede scores, the lower were their cut-off points. This is in agreement with the previous work by Kushwah et al., who showed that increasing the sensitivity of the RCI and Swede scores enhanced their diagnostic performance (64). With a standard cutoff of 5, Reid's score performed slightly worse than the Swede score, but the difference was not statistically significant. Kushwah et al. found that for RCI scores, sensitivity climbed to 100% and specificity was 88.37% when a cutoff of 4 was used, which was comparable to the Swede score at a cutoff of 5. Similarly, Reid, Singla et al. also found similar results with a threshold score of 4. The sensitivity for low-grade lesions was 78.3%, and the specificity was 90.5%. However, the sensitivity for high-grade lesions was 92.9%, and the specificity was 86.5% (65). Strander et al. reported a specificity of 90% for a total score of 8 or higher on the Swede score, whereas a score of less than 5 did not show any lesions of CIN2 or worse. On the other hand, 70% of the larger lesions with two points or more presented at least CIN2 on histological diagnosis (63). Bowring et al. reported a specificity of 95% for CIN2 or worse and a sensitivity of 38% for scores of 8 or above. When the threshold was dropped to 6, however, there was a gain in specificity (65%) but a decrease in sensitivity (82%). Scores of 3 or less yielded a negative predictive value of 90% (60), showing that low scores were strongly negatively predictive. All of this research combined with our results suggests that the first cutoff for lesion severity determination is not necessarily the optimal decision for any population. Our investigation showed that decreasing the requirements for RCI (>3) and Swede score (>5) increases the sensitivity (100 vs. 90% and 100 vs. 80%, respectively) and decreases the specificity (86 vs. 90% and 80 vs. 98%, respectively). Thus,

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both scores are more appropriate as screening tests with lower criteria and as confirmatory tests with the original criteria.

Conclusions

It appears that both scoring methods work well because we were able to utilise them to assess the cervical lesions. Assuming the scores are applicable to Iraqi women and simplifying the colposcopy process is another possibility. Reducing the RCI score to 3 and the swede score to 5 will guarantee that no high-grade lesion will go unnoticed. The tool's performance as a screening test is enhanced by lowering the criteria, and the performance of both scores as confirmatory tools is enhanced by keeping the original criteria.

Recommendation

When screening Iraqi women for high-grade lesion, we can use either the RCI score or the Swede score.

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