

A comparative study between Reid's colposcopic index score and Swede score in women suspected of cervical cancer

Swati Priya, Raghunandan Kumar, Gauri Gandhi, Suhagini Murmu, Krishana Agarwal

Corresponding author: Dr. Swati Priya, 4D, Supriya Rajdulari Apartments, Ranjan Path, New Baily Road, Patna: 801503 (Bihar), India; Email : drswatipriya6801@gmail.com

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ABSTRACT

Objectives: This prospective study was conducted to compare the two widely used colposcopic indices: Reid Colposcopic Index (RCI) score and Swede score. **Materials and Methods:** This study was conducted on 567 women aged more than 21 years who had a positive screening test or were having symptoms of postcoital / postmenopausal bleeding or unhealthy looking cervix. Colposcopic examination was done in all such patients. RCI score and Swede score were calculated from the colposcopic findings. Biopsy was taken and HPE results were recorded. **Results:** The mean age was 38.6 ± 9.95 years. There was an excellent correlation between the RCI and Swede scores (correlation coefficient: 0.94 and P value <0.0001). However, the sensitivity and NPV of Swede score (P value <0.0001) was more than RCI score (P value <0.0001) for a cut-off of 5+ for both the scores for detection of CIN-II+. Larger size of lesions (score 2) was associated with malignant cases. **Conclusion:** Swede score and RCI score have good correlation in detecting cervical cancer. However, Swede score is better than RCI score. Swede score of 5+ for CIN-II+, is a good screening tool, with sensitivity and NPV of 100%. The inclusion of lesion size in Swede score makes it better than RCI score.

Keywords: Cervical cancer, Reid's colposcopic index, Swede score.

With 5,70,000 new cases every year, cancer cervix is the fourth most common cause of cancer in women worldwide. It accounts for more than 3,00,000 deaths annually.¹ One-fourth of the total worldwide burden of cervical cancer cases are reported from India.² Carcinoma cervix has a long progression period from the premalignant lesions to the invasive cervical cancer.³ With early detection, the cure rates of carcinoma cervix approach 100%.⁴ Hence, many screening methods have been developed like Pap(Papanicolaou) smear⁵ and aided visual methods [Visual inspection with acetic acid (VIA)⁶ and Visual inspection with lugol's iodine (VILI)].⁷

Colposcopy was developed by Hans Hinselmann in

1925.⁸ Colposcopic biopsy and histopathological examination (HPE) remains the gold standard for the diagnosis of cervical cancer. Colposcopy enables precise biopsies from abnormal/dysplastic areas and from obvious growths. However, taking biopsy in every patient is not possible in a developing country with limited resources. Also, generally advanced cancer is detected on biopsies taken from cases having obvious growths.

Therefore, scoring systems were developed for making the colposcopy more objective and to screen the high risk cases. One such scoring system is the Reid's colposcopic index (RCI). It was developed by Reid and Scalzi in 1985.⁹ It is based on histological characteristics of the lesion like

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margin, color, type of vascularity and iodine staining.¹⁰ Another widely used index developed by Strander et al, in 2005, was the Swede score.¹¹ This score consisted of 5 features: acetouptake, margin and surface, vessels, lesion size, and iodine.¹² This study was conducted to compare these two popularly used indices.

Materials and methods

This prospective, observational, analytical study was conducted after obtaining approval from the institutional ethics committee. All women attending the gynaecology out patient department (OPD) of Lok Nayak Hospital, New Delhi from November 2015 to January 2018 and who met the inclusion and exclusion criteria, were included in the study. Pap smear was done in all women attending the OPD during this period.

Inclusion criteria:

1. Sexually active women aged more than 21 years
2. Having symptoms of postcoital/postmenopausal bleeding or unhealthy looking cervix
3. Positive pap smear/VIA/VILI.

Exclusion criteria:

1. Pregnant women
2. Women having frank visible growth on cervix
3. Previously treated for cervical intraepithelial neoplasia (CIN) or cancer cervix
4. Patients not consenting to participate in the study

A total of 567 patients were included in the study. A written informed consent was obtained from all the patients. Demographic details, relevant clinical history and details of routine examination were recorded. Per vaginal and per speculum examination were carried out.

Pap smear was done in all women. After confirming the women is not in menstrual phase, has maintained abstinence and has not used vaginal douche or spermicidal cream or jelly in the last two days; per speculum examination was done. Long end of the Ayre’s spatula was rotated at external os, keeping the short end inside and smear is obtained. Endocervical cytology smear was taken using endocervical brush. After preparing the smear on the glass slide, it was fixed in 95% ethyl alcohol. The sample was graded as per the Bethesda system of classification as follows:¹³

0: Negative for intraepithelial lesion or malignancy (NILM)

1: Other non-neoplastic findings - reactive cellular changes associated with inflammation (includes typical repair), radiation, intrauterine contraceptive device (IUD); glandular cells status post hysterectomy; atrophy

2: ASCUS: Atypical squamous cells of undetermined significance

3: ASC-H: Atypical squamous cells cannot exclude HSIL

4: AGC: Atypical glandular cell

5: LSIL: Low grade squamous intraepithelial lesion

6: HSIL: High grade squamous intraepithelial lesion

7: Malignant

Screening by VIA was done by smearing the cervix using a cotton swab dabbed with 5% acetic acid solution and the

Table 1: Reid’s Colposcopic index¹⁴

Colposcopy sign	Score 0	Score 1	Score 2
Margin	Condylomatous or micropapillary contour. Flocculated or feathered, jagged, angular, satellite lesion, AWA beyond original squamo-columnar junction	Regular lesion with smooth indistinct borders.	Rolled, peeling edges, sharp margins.
Color	Shiny, snow white, areas of faint (semi-transparent) whitening	Intermediate shade (shiny but grey white)	Dull, oyster grey
Vessels	Uniform, fine calibre non-dilated capillary loops fine punctuation or mosaic	Absence if surface vessels	Definite, coarse punctuation or mosaic
Iodine staining	Any lesion staining Mahogany brown; mustard yellow stains by a minor lesion (by first three criteria)	Partial iodine uptake (mottled pattern)	Mustard yellow staining of a significant lesion (an acetowhite area scoring 3 or more points by first three criteria)

findings were reported after one minute. A distinct acetowhite area within the transformation zone was considered as VIA positive. After 1-2 min of VIA, normal saline was applied to the cervix and then, Lugol’s iodine was applied over the cervix using cotton swab. The iodine uptake was noted as brown (positive uptake), yellow-brown (partial uptake) and canary yellow (no uptake). Areas of no uptake (canary yellow) were considered as VILI positive while areas of partial uptake and positive uptake were considered VILI negative.

All the patients testing positive for either papsmear, VIA or VILI or having suggestive history or unhealthy/suspicious looking cervix were sent for colposcopy.

Colposcopy was performed using a video colposcope (Digital colposcope with workstation, Goldway). The cervix was inspected in good light. Saline was applied to remove any discharge or mucus. After that cervical examination was done using green filter. Any area of leucoplakia present was noted. Then, 5% freshly prepared acetic acid was applied

Table 2: Swede score¹⁵

Colposcopy sign	Score 0	Score 1	Score 2
Aceto uptake	Zero or transparent	Shady, milky. Neither transparent nor opaque	Distinct, opaque, white
Margins/surface	Diffuse	Sharp but irregular, jagged, geographic satellites	Sharp, even difference in surface level, includes cuffing
Vessels	Fine, regular	Absent	Coarse or atypical
Lesion size	Less than 5 cm	5–15 cm or two quadrants	More than 15 cm or three to four quadrants or undefined endocervically
Iodine staining	Brown	Faintly or patchy yellow	Distinct yellow

liberally over the cervix using a cotton swab. Then after one minute of acetic acid application, the entire cervix was examined under magnification ranging from 5 – 25 times. Angio-architecture was noted. Then, cervix was dabbed with normal saline gently and Lugol’s iodine was smeared on cervix using soft cotton balls. Iodine uptake of the cervix was noted. Vaginal walls were also inspected carefully for any lesion while withdrawing the speculum. The colposcopic

findings were recorded and graded for acetouptake, margin surface, vessels, lesion size, iodine staining. RCI score and Swede score were calculated for each patient, based on the collective scores (as per Tables 1 and 2).^{14, 15}

Biopsy was taken from the most abnormal looking area. It was taken in lithotomy position under anesthesia. The samples were labelled and sent for HPE. The results of the HPE were recorded as: normal, inflammation, CIN-I, CIN-II, CIN-III and invasive cervical cancer (ICC). The HPE results of normal, inflammation and CIN-I were grouped as ‘Benign’ and CIN-II, CIN-III and ICC were grouped under ‘Malignant’.

Statistical Analysis: Analysis was carried out using SPSS. The prevalence of all the relevant qualitative parameters were expressed as number of cases and percentages. Quantitative parameters were described in terms of mean and standard deviation. The sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) for RCI and Swede scores were calculated separately. The P value was calculated by ‘unpaired t test’ for quantitative data and ‘chi square test’ for qualitative data (‘fisher’s exact test’ was used when any cell value was less than 5). P value of less than 0.05 was considered to be ‘statistically significant’.

Results

The mean age of the study population was 38.6 ± 9.95 years (range 22 to 65 years). Most of the women were multiparous (Para 3: 35.8% and Para 2: 30.5%). Table 3 shows the RCI score according to the type of pathology on HPE. RCI score of less than 5 was mostly associated with benign pathologies (>90%) whereas score of 6 or more is

associated with malignant pathologies. Table 4 shows the Swede score according to the type of pathology on HPE. Swede scores of less than 5 were associated with benign pathologies whereas scores of 5 or more were associated with malignant

pathologies. Table 5 shows the sensitivity, specificity, positive predictive value and negative predictive values of the RCI and Swede scores with a cut off of 5 for the

Table 3: RCI score according to the type of pathology on HPE

RCI Score	Benign		Malignant		Total
	Number	Percentage	Number	Percentage	
0	28	100.0%	0	0.0%	28
1	36	100.0%	0	0.0%	36
2	206	94.5%	12	5.5%	218
3	80	92.0%	7	8.0%	87
4	42	87.5%	6	12.5%	48
5	39	90.7%	4	9.3%	43
6	31	64.6%	17	35.4%	48
7	7	31.8%	15	68.2%	22
8	9	24.3%	28	75.7%	37
Total	478	84.3%	89	15.7%	567

detection of high grade lesions (CIN-II+). There was an excellent correlation between the RCI and Swede scores (correlation coefficient: 0.94 and P value <0.0001).

Table 4: Swede score according to the type of pathology on HPE

Swede Score	Benign		Malignant		Total
	Number	Percentage	Number	Percentage	
0	27	100.0%	0	0.0%	27
1	5	100.0%	0	0.0%	5
2	53	100.0%	0	0.0%	53
3	170	100.0%	0	0.0%	170
4	109	100.0%	0	0.0%	109
5	30	56.6%	23	43.4%	53
6	22	100.0%	0	0.0%	22
7	35	87.5%	5	12.5%	40
8	13	31.0%	29	69.0%	42
9	7	25.0%	21	75.0%	28
10	7	38.9%	11	61.1%	18
Total	478	84.3%	89	15.7%	567

However, the sensitivity and NPV of Swede score (P value <0.0001) was more than RCI score (P value <0.0001) for both the scores for detection of CIN-II+.

Table 5: RCI score and Swede score of 5+ for CIN II+

Parameters	RCI score (5+)	Swede Score (5+)
Sensitivity	71.9%	100.0%
Specificity	82.0%	76.2%
PPV	42.7%	43.8%
NPV	94.0%	100.0%
P value	<0.0001	<0.0001

the variation of lesion size with the type of pathology on HPE. The lesion size was scored as 0 (less than 5 mm), 1 (5 to 15 mm) and 2 (more than 15 mm). Larger size of lesions (score 2) was associated with malignant cases. 2.2% of the cases having score 0 were malignant on HPE, 15.0% of cases

Table 6: Lesion size and HPE results

Score Lesion size	Normal		Inflammation		CIN I		CIN II		CIN III		ICC		Total
	N	%	N	%	N	%	N	%	N	%	N	%	
0	23	51.1%	13	28.9%	8	17.8%	0	0.0%	0	0.0%	1	2.2%	45
1	222	44.4%	164	32.8%	39	7.8%	21	4.2%	21	4.2%	33	6.6%	500
2	0	0.0%	2	9.1%	7	31.8%	0	0.0%	8	36.4%	5	22.7%	22
Total	245	43.2%	179	31.6%	54	9.5%	21	3.7%	29	5.1%	39	6.9%	567

with score 1 were malignant and 59.1% cases having score 2 were found to be malignant.

Discussion

Cervical cancer is the fourth common cancer in women. With early detection, it is the most treatable type of cancer.¹⁶ Therefore, effective screening methods play an important role. After being screened positive, the patient undergoes colposcopy, which is an invasive and painful procedure. In a limited resource setting, the biopsy of every patient may not be possible. Therefore, the scoring systems devised on the basis of characteristic of the lesion on colposcopy aid in further screening of the patients. This study was conducted to compare two such popularly used scoring systems: the RCI score and the Swede score.

In the present study, the mean age was 38.6 ± 9.95 years. This was similar to the study by Usmani K et al, where the mean age was 37.53±8.98 years.¹⁷ In another study by Kushwah B and Kushwah S, they observed that the majority of the women (56.25%) were in the age group of 30 to 39 years, with a mean age of 40.05 ± 7.84 years.¹⁸ In another study by Ranga R et al, the mean age 40.3 ± 8.1 years. This was similar to the present study, indicating that women nearing 40 years are at high risk for cervical cancer.¹⁹ In the study by Suwanthananon C and Inthasorn P, the mean age was 40.65 years (range: 20 to 73 years).²⁰ In the study by Karya U et al, the mean age was 41.64 years, with the majority of the women (41.6%) belonging to the age group of 31 to 40 years.²¹ This was similar to the previous studies.

In the present study, 84.3% were benign lesions (squamous metaplasia, inflammation and CIN-I) and 15.7% were malignant lesions (CIN-II, CIN-III and malignant). This was similar to the study by Usmani K. et al, where 77.2% lesions were benign and 22.8% lesions were malignant.¹⁷ In another study by Kushwah B and Kushwah S, 70.7% of the lesions were found to be benign.¹⁸ In another study by Suwanthananon C and Inthasorn P, where the majority of the lesions were benign (73%).²⁰ In the study by Karya U et al, only 8.4% of the lesions were found to be malignant.²¹ This was a little higher than the previous studies. Thus, it can be effectively concluded that the majority of the lesions are benign.

Variation of scores according to the type of lesion on HPE: In the present study, 37.8% of the cases had RCI score of 2. RCI scores of 0 to 3 were mostly associated with benign lesions (more than 90%). This was similar to the study by Kushwah B and Kushwah S, where most of the cases (26.25%) had RCI score of 2.¹⁸ Similarly in the study by Usmani K et al, it was observed that RCI scores of 0 to 2 were associated with benign lesions (cervicitis and CIN-I).¹⁷ In another study by Suwanthananon C and Inthasorn P, it was observed RCI scores of 0 to 3 were mostly associated with benign lesions (more than 90%).²⁰ In another study by Ranga R. et al, it was observed that the RCI scores of 0 to 2 were mostly associated with benign changes.¹⁹

Also, in the present study, majority of the cases had a Swede score of 3 (30%). Swede scores of 0 to 4 were associated with benign lesions. In the study by Usmani K et al, it was observed that Swede scores of 0 to 4 were associated with benign lesions (cervicitis and CIN-I).¹⁷ This was similar to the present study. In another study by Kushwah B and Kushwah S, 26.15% of the cases had Swede score of 3.¹⁸ This was also similar to the present study. In the study by Suwanthananon C and Inthasorn P, they observed that Swede scores of 0 to 3 were associated with benign lesions,²⁰ which was almost similar to the present study.

RCI score vs Swede score: In the present study, the sensitivity, specificity, PPV and NPV of RCI score at the cut off of 5 to detect high grade lesions (CIN-II+) were 71.9%, 82%, 42.7% and 94% respectively. And of Swede score at the cut off of 5 to detect high grade lesions (CIN-II+) were 100%, 76.2%, 43.8% and 100% respectively. There was an excellent correlation between the Swede score and the RCI score, with correlation coefficient of 0.94 (P value <<0.0001). It was also observed that the sensitivity and NPV of Swede score was much more than the RCI score.

In the study by Karya U et al, the values of sensitivity, specificity, PPV and NPV of RCI score for a cut off of 5 for detecting high grade lesions were 95.2%, 98.7%, 86.9% and 99.6% respectively and of Swede score for a cut off of 5 were 100%, 91.6%, 52.5% and 100% respectively. Similar to the present study, the sensitivity and NPV of Swede score were 100% and was better than RCI score. They also found

an excellent correlation between the RCI score and Swede score (correlation coefficient: 0.879; P value <0.001).²¹

In the study by Kushwah B and Kushwah S, the values of sensitivity, specificity, PPV and NPV of RCI score for a cut off of 5 for detecting high grade lesions were 94.44%, 91.48%, 80.95% and 97.73% respectively and of Swede score for a cut off of 5 were 100%, 91.3%, 82.6% and 100% respectively. Similar to the present study, the sensitivity and NPV of Swede score were 100%. They also found an excellent correlation between the RCI score and Swede score (correlation coefficient: 0.92).¹⁸

In the study by Ranga R et al, the values of sensitivity, specificity, PPV and NPV of RCI score for a cut off of 5 for detecting high grade lesions were 96.97%, 95.35%, 88.89% and 98.8% respectively and of Swede score for a cut off of 5 were 100%, 88.37%, 76.74% and 100% respectively. Similar to the present study, the sensitivity and NPV of Swede score were 100%. They also found an excellent correlation between the RCI score and Swede score (correlation coefficient: 0.919).¹⁹

In the study by Suwanthananon C and Inthasorn P, the values of sensitivity, specificity, PPV and NPV of RCI score for a cut off of 5 for detecting high grade lesions were 83.7%, 89.7%, 75% and 93.7% respectively and of Swede score for a cut off of 5 were 88.4%, 87.1%, 71.7% and 95.3% respectively.²⁰ Similar to the present study, the sensitivity and NPV of Swede score was better than RCI score. In the study by Usmani K et al, the sensitivity, specificity, PPV and NPV of Swede score for a cut off of 5 for detecting high grade lesions were 100%, 86.4%, 68.4% and 100% respectively.¹⁷ This was similar to the present study.

Variation of size of lesion with type of lesion on HPE: In the present study, it was observed that increasing lesion size was associated with increasing number of malignant cases. 59.1% cases having a score of 2 (lesion size more than 15 mm) were found to be malignant on HPE. This was similar to the study by Kushwah B and Kushwah S, where increasing lesion size was associated with more number of malignant cases. 71.4% of the cases having a score of 2 on lesion size were found to be malignant on HPE. They also observed that all the cases of CIN-II had a score of 1 on lesion size.¹⁸ This was also similar to the present study.

In another study by Ranga R et al, they also observed that 62.5% of the cases having a score of 2 on lesion size were found to be malignant on HPE. This was similar to the present study. It was also found that all the cases of CIN-II

had a score of 1 on lesion size.¹⁹ Karya U et al, in their study, observed that lesion size of more than 15 mm are associated with high grade lesions and malignancy (CIN-II, CIN-III and ICC).²¹ This was similar to the present study.

Limitations: The study was limited by the OPD attendance of the patients screened positive for cervical cancer. Therefore, the results may not be generalised.

Conclusion

It can be effectively concluded from the study that women in late thirties are the high risk group for cervical cancer. Swede score and RCI score have good correlation in detecting cervical cancer. However, Swede score is better than RCI score. Swede score of 5+ for CIN-II+, is a good screening tool, with sensitivity and NPV of 100%. Larger lesions are mostly associated with malignancies. The inclusion of lesion size in Swede score makes it better than RCI score.

Conflict of interest: None. **Disclaimer:** Nil.

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**Swati Priya¹, Raghunandan Kumar², Gauri Gandhi³,
Suhagini Murmu⁴, Krishana Agarwal⁵**

¹ Senior Resident, Department of Obstetrics and Gynecology, AIIMS, Patna, Bihar, India; ² Senior Resident, Department of Anesthesia, JNKTMCH, Madhepura, Bihar, India; ³ Director-Professor, Department of Obstetrics and Gynecology, Maulana Azad Medical College and associated hospital, New Delhi, India; ⁴ Senior Resident, Department of Obstetrics and Gynecology, AIIMS, Patna, Bihar, India; ⁵ Associate Professor, Department of Obstetrics and Gynecology, Maulana Azad Medical College, New Delhi, India.