Colposcopic Evaluation Using Swede Score as a Tool to Screen Suspicious-looking Cervix and its Correlation to Histopathological Findings

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ABSTRACT

Background: Cancer cervix is one of the leading causes of female mortality in India. Different methods are used for its screening as it has a long latent phase. Colposcopic-directed cervical biopsy of an unhealthy-looking cervix is taken as the gold standard in the diagnosis of cervical intraepithelial lesions. However, a relatively new colposcopy scoring system known as the Swede score has a high specificity and can omit the need of biopsy in preinvasive cervical lesions.

Objective: To evaluate the efficacy of colposcopy using Swede score as a screening modality in unhealthy cervix and to correlate its finding with histopathology.

Materials and methods: The present study has been conducted in the Department of Obstetrics & Gynaecology at a tertiary care facility of North India from 1st June 2020 to 31st May 2021. Among 99 patients who fulfilled the inclusion and exclusion criteria, colposcopy was done, and cervical biopsy was taken from the suspicious sites. The findings of colposcopy and histopathology were correlated.

Result: About 23% (23/99) of the total patients had a Swede score of 5 or more, out of whom 43.47% (10/23) were found to have preinvasive or invasive lesions (p-value < 0.001).

Using a Swede score >8, 80% (8/10) patients had preinvasive or invasive lesions with a significant p-value of <0.001. Swede score of 8 or above had an excellent specificity of 100% for high-grade lesions, although the sensitivity was 80%. However, on lowering the cutoff to 5, the sensitivity improved to 100% at the cost of specificity (85.23%).

Conclusion and clinical significance: It was evident that colposcopy, using Swede score of >5 and even of >8 as cutoff, is definitely more sensitive and accurate in screening of unhealthy-looking suspicious cervix in Indian population and can be considered to use for treating the patients directly by excision or cryotherapy as a "see and treat" method, avoiding the need for cervical biopsy for histopathological confirmation.

Keywords: Cervical biopsy, Cervical cancer, Colposcopy, Screening, Swede score, Visual examination using acetic acid.

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INTRODUCTION

Cervical carcinoma is one of the major causes of female mortality in developing countries, with India alone accounting for one-fourth of the cases worldwide. It is observed that during their lifetime, 1 in every 53 Indian women have a threat of developing cervical cancer as compared to 1 in every 100 women in the developed world.[1] The transformation zone is represented by the squamo-columnar junction, and it is in this area where abnormal nuclear changes occur leading to malignant transformation of the cells. Human papilloma virus (HPV) has been detected in almost all cases of cervical cancers and hence is said to play a crucial role in its development.[2] Squamous cell carcinoma is the most common type of cervical cancer on histology accounting to 70% of all cases, followed by adenocarcinoma.

Although cervical cancer has a long latent phase, it continues to have a high incidence and prevalence in resource-poor countries like India, as the health system is not well organized along with the added disadvantage of lack of effective screening programs aimed at detecting premalignant and malignant lesions. Methods like Pap smear, HPV DNA test, visual examination using acetic acid (VIA), and Lugol's iodine (VILI) are routinely used for screening.[3] In low-resource settings, it is difficult to execute screening programs that are based on cytology as they are laboratory dependent

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and require not only the expensive instruments, but also good support of trained technicians and skilled personnel to prepare and interpret the slides. Also, cytology needs to be repeated at regular intervals for effective results.[4] Due to a lack of adequate cytology screening facilities super added by large number of cervical cancer cases in developing countries, VIA has been taken as an alternative screening method to cervical cytology. It has the advantage of being inexpensive and the results are available immediately. However, the accuracy and reliability of VIA have been doubted

over recent years.[5,6] Hence, colposcopy as the screening procedure still remains the reference gold standard.[7] It is a simple, noninvasive OPD procedure that takes into account the location, size, margins, vascularity, and extent of abnormal cervical lesions. The limitation of colposcopy is that its accuracy is related to the experience of the performing personnel. Hence, few scoring systems have been proposed to make diagnosis by colposcopy less subjective and to grade the severity of premalignant lesions.

Reid Colposcopic Index (RCI), proposed by Reid and Scalzi,[8] is a one such well-known scoring system that includes color of aceto-white areas, margins of lesion, vascular pattern, and iodine staining. A new scoring system, devised by Strander et al.,[9] called the Swede score, which includes lesion size in addition to the above four colposcopic indices, along with few modifications in the definition of already existing variables. Being simple to assimilate, it can also be used by colposcopist of any grade. Their results showed that no lesion of cervical intraepithelial neoplasia 2 (CIN 2) or worse were seen in a score of less than 5. Hence, this study was done with an aim to evaluate the efficacy of colposcopy using Swede score as a screening method in unhealthy cervix and to correlate its finding with histopathology as colposcopically-guided biopsy of unhealthy-looking areas on cervix is considered to be the gold standard in establishing a diagnosis of intraepithelial lesions.[10]

MATERIALS AND METHODS

The present cross-sectional study was conducted in the Department of Obstetrics & Gynaecology at a tertiary care facility of North India over 1 year duration from 1st June 2020 to 31st May 2021. Women who satisfied the inclusion and exclusion criteria were selected in the study.

Inclusion Criteria

- Women aged between 25 and 60 years
- Women having complaints of lower abdominal pain, persistent vaginal discharge, or abnormal bleeding patters (postmenopausal bleeding per vaginam or postcoital bleed)
- Patients with unhealthy looking cervix
- Patients with Pap smear reports of inflammatory, atypical squamous cells of undetermined significance (ASCUS), or low-grade squamous intraepithelial lesions (LSIL) after routine screening

Exclusion Criteria

- Unsatisfactory colposcopy
- Frank cervical cancer or obvious growth
- Post hysterectomy status
- Any procedure done on cervix in the past (e.g., biopsy, cryotherapy, and conisation)
- Severe debilitating disease
- Pregnancy

Methodology

After obtaining approval from the Ethical Committee of the University and informed consent from all subjects, all women were subjected to detailed history, general physical examination, per speculum, and bimanual examination. All were screened for cervical malignancy by VIA, VILI, and Pap smear. Patients exhibiting inflammatory, ASCUS, and LSIL on cytology were also subjected to colposcopy and biopsy was taken in the presence of abnormal sites. Patients with normal colposcopy findings were subjected to

Table 1: Distribution of the patients according to cervical biopsy findings

Cervical biopsy		Frequency	Percentage
Normal	Normal	14	14.2
	Chronic cervicitis	75	75.6
Abnormal	CIN	8	8.2
	SCC	2	2.0
Total		99	100.0
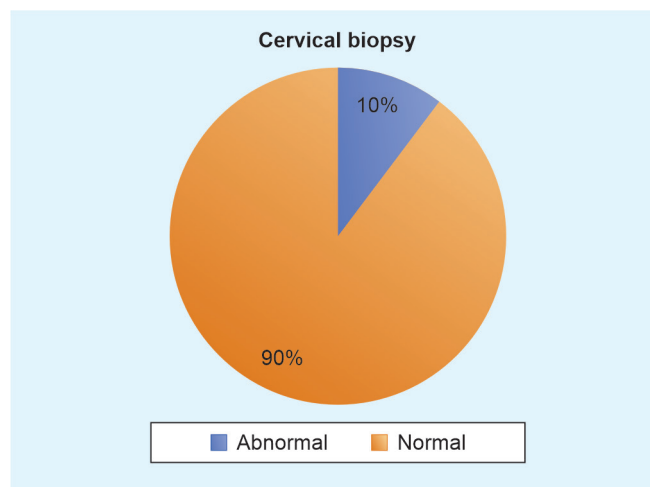
Fig. 1: Distribution of the patients according to cervical biopsy findings

biopsy from the transformation zone of the cervix. The findings of colposcopy and histopathology were correlated.

Statistical Analysis

In the statistical analysis, percentages (frequencies) of various parameters were calculated and subjected to statistical test using the Chi-square test and student's t test where applicable. The computation was done using the Microsoft Excel 2007. $p < 0.05$ was considered statistically significant.

RESULTS

Out of 103 women who were included as study participants, 4 lost to follow-up and hence 99 patients were studied. Abnormal cervical biopsy findings in the form of CIN or squamous cell carcinoma were found in 10% of cases (Table 1, Fig. 1).

Among the study group, 90% (9 out of 10) women who had abnormal cervical biopsy were in the age-group of 35 years and above. About 70% of the women with abnormal histopathological findings had a prolonged duration of marriage of at least 20–30 years which came out to be statistically significant with a p-value of 0.033. Incidence of CIN was found to be maximum among women having two or more children (Table 2).

The majority of patients with abnormal bleeding patterns per vaginam as a presenting complaint had abnormal histopathological findings, which was found to be a significant statistical finding (p-value < 0.001) (Table 3).

Out of the total 10 patients who had abnormal cervical biopsy findings on histopathology, 9 patients had lesion size >5 mm. A lesion size of >15 mm was found in four patients and all of these patients had abnormal cervical biopsy findings. No patient with a lesion size of >15 mm had normal cervical biopsy findings. This finding was highly statistically significant with a p-value of < 0.001 (Table 4).

Table 2: Correlation of sociodemographic parameters with cervical biopsy findings

| Variables | | Cervical biopsy | | | | Chi-square test p-value |
| | | | | Normal | | |
Variables	Abnormal	N	%	N	%	p-value
Age-group	≤30	1	10.0%	6	6.8%	0.429
	31–35	0	0.0%	7	8.0%	
	36–40	3	30.0%	28	31.8%	
	41–45	1	10.0%	27	30.7%	
	46–50	3	30.0%	13	13.6%	
	>50	2	20.0%	8	9.1%	
Socioeconomic status	Lower	0	0.0%	4	4.5%	0.244
	Upper lower	3	30.0%	14	15.9%	
	Lower middle	5	50.0%	24	26.1%	
	Upper middle	2	20.0%	39	44.3%	
	Upper class	0	0.0%	8	9.1%	
Duration of marriage	<5 years	1	10.0%	3	3.4%	**0.033**
	5–10 years	0	0.0%	15	17.0%	
	10–20 years	2	20.0%	44	50.0%	
	20–30 years	7	70.0%	27	29.5%	
Parity	P1	1	10.0%	5	5.7%	0.302
	P2	0	0.0%	24	26.1%	
	P3	5	50.0%	37	42.0%	
	≥P4	4	40.0%	23	26.1%	

Bold denotes statistically significant data ($p < 0.05$)

Table 3: Correlation of clinical features with cervical biopsy finding

| Variables | | Cervical biopsy | | | | Chi-square test p-value |
| | | | | Normal | | |
Variables	Abnormal	N	%	N	%	p-value
Bleeding PV	Yes	6	60.0%	12	12.5%	**<0.001**
	No	4	40.0%	77	87.5%	
Intermenstrual bleeding	Yes	5	50.0%	9	9.1%	**<0.001**
	No	5	50.0%	80	90.9%	
Postcoital bleeding	Yes	4	40.0%	3	3.4%	**<0.001**
	No	6	60.0%	86	96.6%	
Postmenstrual bleeding	Yes	2	20.0%	6	6.8%	0.149
	No	8	80.0%	83	93.2%	
Lower abdominal pain	Yes	8	80.0%	75	84.1%	0.740
	No	2	20.0%	14	15.9%	
Vaginal discharge	Yes	10	100.0%	84	94.3%	0.439
	No	0	0.0%	5	5.7%	
	No	8	80.0%	86	96.6%	

Bold denotes statistically significant data ($p < 0.05$)

Out of the total participants (99), 23 patients had a Swede score of 5 or above, with 10 of them having a Swede score of 8 or above (Table 5, Fig. 2).

About 23% (23/99) of the total patients had a Swede score of 5 or above, out of whom 43.47% (10/23) were found to have preinvasive or invasive lesions with a significant p-value of < 0.001. No women with Swede score of <5 had abnormal cervical biopsy findings.

Table 4: Correlation of lesion size with cervical biopsy finding

| Variables | | Cervical biopsy | | | | Chi-square test p-value |
| | | | | Normal | | |
Variables	Abnormal	N	%	N	%	p-value
Lesion size	<5 mm	1	10.0%	78	87.5%	**<0.001**
	5–15 mm or 2 quadrants	5	50.0%	11	12.5%	
	>15 mm or 3–4 quadrants or endocervical undefined	4	40.0%	0	0.0%	
	Total	10	100%	89	100%	

Bold denotes statistically significant data ($p < 0.05$)

Table 5: Distribution of patients according to Swede score

Swede score	Frequency (n)	Percentage (%)
0–4	76	76.5
5–7	13	13.7
8–10	10	10.2
Total	99	100.0
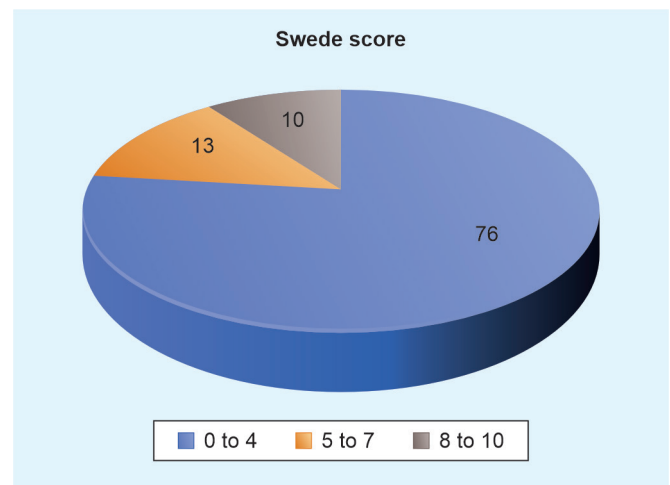
Fig. 2: Distribution of patients according to Swede score

Table 6: Correlation of Swede score with cervical biopsy finding

| Variables | | Cervical biopsy | | | | Fisher's exact test p-value |
| | | | | Normal | | |
Variables	Abnormal	N	%	N	%	p-value
Swede score	≥5	10	100.0%	13	14.8%	**<0.001**
	<5	0	0.0%	76	85.2%	
	Total	10	100.0%	89	100.0%	
Swede score	>8	8	80.0%	2	2.25%	**<0.001**
	≤8	2	20.0%	87	97.75%	
	Total	10	100.0%	89	100.0%	

Bold denotes statistically significant data ($p < 0.05$)

About 10% (10/99) of women had a Swede score of more than 8 and 80% (8/10) of them had preinvasive or invasive lesions. This finding was statistically significant with a p-value of < 0.001 (Table 6).

A Swede score of 8 or more had a specificity of 100% for high-grade lesions, with a sensitivity of 80% and accuracy rate of 97.96%,
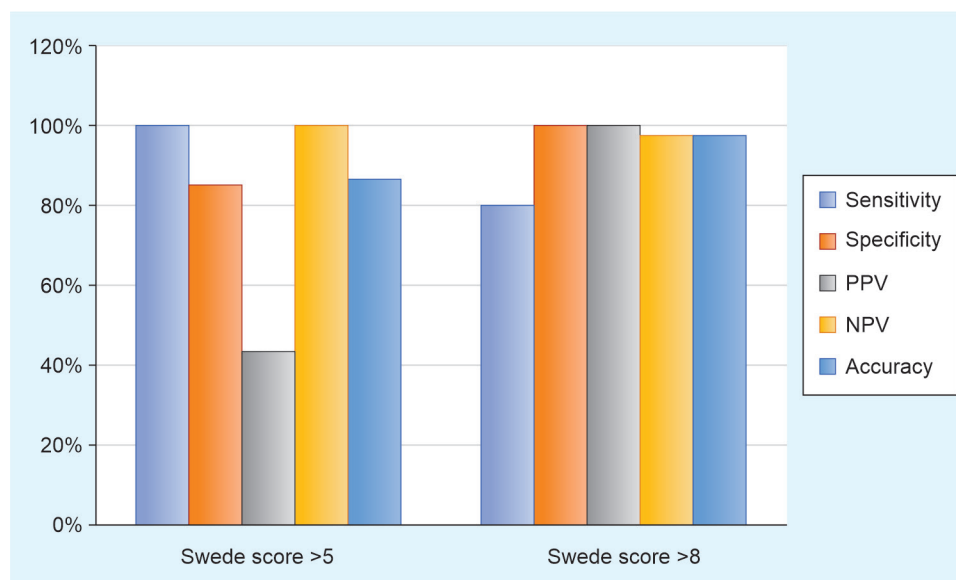
Fig. 3: Swede score analysis

whereas taking the cutoff as 5 improved the sensitivity (100%) at the cost of specificity (85.23%) and also lowered accuracy rate to 86.73% (Fig. 3).

DISCUSSION

Cervical cancer is one of the most common cancers in females in developing countries like India, despite of the fact that it is associated with a long precancerous stage. This allows for sufficient time for screening and treatment thus making it a preventable condition. But as the health system in terms of available resources and effective screening programs to detect precancerous lesions is poorly organized in India, the mortality rates are very high making carcinoma cervix the major cause of cancer-related deaths in Indian females.

In our study, screening was done in 103 women, of which 4 were lost to follow-up and hence total 99 patients in the age-groups from 25 to 60 years with complaints of pain in the lower abdomen, discharge per vaginam, abnormal uterine bleeding, backache, and dyspareunia were included.

The sociodemographic profile of patients in present study was comparable to that of other studies. The mean age was 41.5 years which is comparable to all the other studies,[1,11–13] supporting the fact that as the age increases the incidence of preinvasive and invasive lesions also increases. It also supports that women who are in the reproductive age and sexually active have a higher incidence of unhealthy cervix.

Time period of marriage and sexual contact are directly related to the development of atypical metaplastic cells and hence CIN. In this study, the incidence of CIN was 70% among women who were married for more than 20 years which was comparable to other studies[1,13] who also demonstrated that the severity of CIN increased with the time period of marriage and early age of sexual contact and hence the exposure to HPV.

Strander et al.[9] and Bowring et al.[14] also utilized the Swede score as a useful marker for assessing the severity of the cervical lesion.

Strander et al.[9] found that no patients having a Swede score of <5 exhibited lesion of CIN 2 or worse, and that the specificity for a score of 8 or above was 90%. They also found that 70% of large-sized lesions which scored two points had CIN 2 or worse on histological diagnosis. In the present study, eight subjects of CIN 2 or worse were having more than 2 score for lesion size. Bowring et al.[14] found that a Swede score of 8 or above had a specificity of 95% for CIN 2 or worse with a sensitivity of 38%, whereas lowering the cutoff to 6 improved the sensitivity to 65% but at the cost of specificity (82%). Negative predictive values (NPPs) were higher in patients with lower scores; a score of 3 or less had a NPP of 90%. In the present study, specificity for Swede score at a score of 8 or above was 100% and sensitivity was 80% for high-grade lesions. Lowering the cutoff to 5 increased the sensitivity to 100%, while the specificity became 85.23%. On taking the cutoff value of Swede score as <5 and >5, the positive predictive value (PPV) was found to be 43.48% and NPV was 100% with an accuracy of 86.73%. Whereas, if the cutoff for Swede score was taken as a value of <8 or >8 the accuracy significantly increased to 97.96% with a PPV of 100% and a NPV of 97.78%. The results were comparable to those reported by Bowring et al.[14] and Strander et al.[9]

CONCLUSION

The best approach in the prevention of carcinoma cervix lies in its early diagnosis and subsequent treatment. Thus, it is desirous to make an early diagnosis of CIN by various screening modalities in women, as it is the most common preventable cancer because of its long preinvasive stage (CIN). It is concluded from this study that Swede score performed well as a screening modality on a selected patients coming to gynecology OPD with complaints of lower abdominal pain, discharge per vaginam, dyspareunia, abnormal uterine bleeding, etc. and were planned for colposcopy in view of unhealthy-looking suspicious cervix. From the present study, it is evident that Swede score of 5 and above has a sensitivity of 100%, specificity of 85.23% with an accuracy of 86.73%; Swede score of 8 or above has 100% specificity, 80% sensitivity with an accuracy of 97.96%. This can be used for treating the patients directly by excision or cryotherapy as a "see and treat" method, sparing the need for cervical biopsy. As the number of visits to the hospital is reduced, the chances of loss to follow-up cases are also minimized, thus considering this as a preferred method for the treatment of high-grade lesions.

The main strength of the present study is that cervical biopsies were performed in all patients irrespective of the Pap smear or colposcopy report and hence the verification bias was eliminated. However, for establishing population-based screening programs, a larger data could yield better information, but it could not be done in the present study due to prevailing COVID conditions.

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