EVALUATION OF COLPOSCOPY USING SWEDE SCORE IN SCREENING OF CERVICAL CANCER

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ABSTRACT

BACKGROUND

Cervical cancer is a global health problem. It ranks as the 4th leading cause of female cancer in the World,(1) the 2nd leading cause of female cancer in India and the 2nd most common female cancer in the women aged 15 to 44 years in World(1) and India. About 527,624 new cases are diagnosed and 265,672 cervical cancer deaths occur annually in the World. Incidence and prevalence of cervical cancer remains high in developing countries due to lack of resources, lack of effective screening programmes and poorly organised health system aimed for detecting precancerous condition before they progress to invasive cancer.

Colposcopy remains the reference standard for assessing the validity of all the screening procedures for cervical cancer. Colposcopy scoring systems provide an objective diagnosis to grade the severity of premalignant lesions and select patients who require treatment. A new scoring system, Swede score, has added lesion size as a parameter.

Objective- This study aimed to evaluate the diagnostic efficacy of colposcopy using Swede score and to determine the degree of correlation between colposcopy impression and histopathology.

MATERIALS AND METHODS

This prospective study carried out in Rajiv Gandhi Government Women and Children Hospital (RGGWCH), Puducherry from February 2016-January 2017; 220 women aged 20 to 65 who met the selection criteria were included in the study. All women underwent colposcopy; the findings were scored by Swede score, biopsy taken from the abnormal areas. Patients in whom colposcopy was normal, biopsy was taken from the cervix within the transformation zone.

RESULTS

According to the Swede scoring system, 133 (60.45%) were benign cases, 64 (29.1%) women were diagnosed as LGL, 23 (10.45%) were diagnosed as HGL. As far as histologic results were concerned, 144 (65.45%) were benign showing chronic cervicitis, whereas 52 (23.64%), 24 (10.9%) were diagnosed as CIN 1 (LGL), HGL (CIN 2, CIN 3) respectively.

CONCLUSION

The 'k' value for the strength of correlation between colposcopy impression for CIN using Swede score and histopathology was k=0.73, for CIN 2+ it was k=0.92. Colposcopy by Swede score had a satisfactory sensitivity of 89.47% and specificity of 86.81% in the detection of CIN. Whereas in the detection of high-grade CIN (CIN 2+), Swede score colposcopy had a sensitivity of 91.67% and specificity of 99.49%.

KEYWORDS

Colposcopy, Swede Score, Cervical Screening, CIN (Cervical Intraepithelial Neoplasia).

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BACKGROUND

Cervical cancer is a global health problem. It ranks as the 4th leading cause of female cancer in the World(1), the 2nd leading cause of female cancer in India and the 2nd most common female cancer in the women aged 15 to 44 years in World(1) and India. About 527,624 new cases are diagnosed and 265,672 cervical cancer deaths occur annually in the World (estimations for 2012).(1)

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In India about 122,844 new cases are diagnosed and about 67,477 cervical cancer deaths occur annually (Estimations for 2012). It ranks as the 4th leading cause of female cancer deaths in the World(1) and 2nd leading cause in India. Incidence and prevalence of cervical cancer remains high in developing countries due to lack of resources, lack of effective screening programmes and poorly organised health system aimed for detecting precancerous condition before they progress to invasive cancer.(2) Cervical cancer has a long latent phase and methods including Pap smear, HPV testing, cervical examination using acetic acid and Lugol's iodine can be used for screening.(3)

In low-resource settings, it has been difficult to implement Cytology-based screening programmes because it is laboratory based and requires expensive equipment with technician support and needs a skilled personnel to prepare and interpret the slides.(4) Cytology needs to be repeated regularly to be effective.(5,6) Unaided VIA has been

suggested as an alternative to cervical cytology due to inadequate or suboptimal cytology screening and high burden of cervical cancer in developing countries.[5,6] VIA is inexpensive, its results are immediately available. However, the reproducibility and accuracy of VIA is questioned during the recent years.[7,8] However, for assessing the validity of all the screening procedures, colposcopy remains the reference standard.[9] It is an OPD procedure, simple, non-invasive, helps in determining the location, size and extent of abnormal cervical lesions. Colposcopy-guided biopsy of suspicious areas is taken as the gold standard in diagnosis of intraepithelial lesions.[10] The limiting factor is its accuracy which is directly related to the experience of its operator. Reid Colposcopic Index (RCI) proposed by Reid and Scalzi, is the well-known scoring system to grade the severity of premalignant lesions and to make colposcopy diagnosis less subjective.[11] It includes colour of acetowhiteness, margins, vascular pattern and iodine staining.

A new scoring system, devised by Strander et al, the Swede score, which includes lesion size as a variable[12] in addition to the above four colposcopic signs along with modifications to definitions of the scores for the remaining variables. The Swede score is simple to use, with no major learning curve; it can also be used by any grade of colposcopist. Their results showed that the specificity for a total score of 8 or higher was 90% and that no lesion of CIN 2 or higher resulted in a score of less than 5. The purpose of this study was to evaluate the diagnostic efficacy of colposcopy using Swede score and to determine the degree of correlation between colposcopic impression and histopathology.

MATERIALS AND METHODS

This prospective, observational study was carried out in Rajiv Gandhi Government Women and Children Hospital (RGGWCH), Puducherry From February 2016-January 2017; 220 women aged 20 to 65 years with complaints of intermenstrual bleeding, postcoital bleeding, excessive discharge per vaginum, recurrent urinary tract infection, recurrent sexually transmitted infections, suspicious cervix on naked eye examination, abnormal Pap smear were studied. Exclusion criteria were as follows: Diagnosed and treated cases of cervical cancer, obvious cervical growth on per speculum examination, Status post total hysterectomy women, pregnant women, Menstruating women, untreated vaginal infection, unsatisfactory colposcopy, the study protocol was approved by the ethics committee of the institute. All subjects were included in the study after an informed and written consent was obtained.

A detailed history was taken, and complete general physical and pelvic examination was performed. First, a naked eye examination of the cervix was done to look for any obvious findings. The note was made of any abnormal discharge. After this, excess mucus was removed gently from the cervix with saline-soaked cotton swabs. Normal saline solution was used to examine details of cervical capillaries and surface blood vessel aided by the use of a green filter and by use of higher levels of magnification (15X). 3 percent freshly prepared glacial acetic acid was gently applied over the cervix using a cotton swab for 2 minutes. After 45 seconds the epithelial changes were noted and recorded. Four colposcopic variables, acetowhiteness, margins plus surface, vessel pattern, lesion size were analysed and scored with 0, 1, 2 points using Swede score. Lugol's iodine was applied and the iodine uptake was noted and scored using Swede score. Findings were documented on an Odell's diagram and colposcopic impression was noted using Swede score. Colposcopy-directed punch biopsies were obtained from the abnormal areas. Patients in whom colposcopy was normal, biopsy was taken from the cervix within the transformation zone. Patients with unsatisfactory colposcopy were excluded from the study. Biopsy samples were sent for histopathological examination in 10% formalin. Histology is compared with colposcopic Swede score. The Swede Score has a total score of 0–10. A score of ≥5 is reported to identify all high-grade lesions (HGL).[13] Data entry was done by using MS Excel 2013 and Analysis was done by using SPSS version 21.0. Proportions were calculated for categorical variables. Chi-square test was used to test the statistical significance between two categorical variables. Kappa Values were calculated. A p value less than 0.05 was considered statistically significant. Sensitivity, Specificity and predictive values were calculated to measure the accuracy and validity of the test.

RESULTS

A total of 220 women were recruited in the study. The mean age was 43.6 ± 7.47 years with the majority (n= 170, 77.3%) between 30-49 and the minimum age among the participants was 23 years. The mean age at marriage was 19.2 years, 76.8% (n=169) had their marriage by 20 years of age. 50.5% (111) had >25 years of married life. Most women were with a para 2 (n=94, 42.7%) followed by para 3 (n=85, 38.6%). Nearly 16.8% (n=37) had a parity index of more than 3. 73.2% (161) had a birth spacing ranging from 2-3 years. Colposcopy was done for leucorrhoea in 132 women, comprising 60%. Further reasons for which colposcopy was done were unhealthy cervix 26.8% (59), abnormal Pap 9.1% (7), postictal bleeding 3.2% (2), and intermenstrual bleeding 0.9% (20). 95 had inflammatory Pap smear contributing 43.25%, followed by ASCUS in 64 (29.1%) of the study participants. 18 had LSIL, 6 had HSIL, 4 had ASC-H findings in the Pap smear contributing 8.2%, 2.7%, 1.8% respectively. In 33 participants, Pap report was not available.

In the present study, according to Swede score, there were 220 cases as shown in Table 1. On histopathology, 144 (65.45%) were benign showing chronic cervicitis, whereas 52 (23.64%) and 24 (10.9%) cases were diagnosed as CIN 1 (LGL) and HGL (CIN 2, CIN 3) respectively (Table 2).

High-grade lesions (CIN 2, 3) were more commonly found in the age group of 40-59. The proportion of participants with high-grade lesion are significantly more in older participants as compared to that of the younger participants. Also, this association was found to be statistically significant (p value – 0.041).

Swede score colposcopy was compatible with histopathology results for 86.81% of the subjects (Benign-125+CIN 1-44+CIN 2 -6+CIN 3-16) (Table 3). Out of 220 cases, number of patients diagnosed as having CIN based on the histopathological results and Swede score was 76(34.54%) and 87(39.55%). Out of the 144 (65.46%) biopsy negative cases using CIN 1 as the disease threshold, colposcopy could accurately confirm the absence of disease in

125 (56.81%) cases. In the remaining 19 biopsy negative cases, colposcopic diagnosis of LGL was made in 18 (8.2%) cases and HGL in one (0.45%) case.

Of the 52 (23.64%) cases of biopsy proven CIN 1, 44 (20%) were accurately diagnosed using Swede score in colposcopy and 8 (3.64%) were negative of CIN by Swede score colposcopy. None of the case was overestimated. Of the 24 (10.9%) cases of biopsy proven CIN 2 and above (CIN 2+), 22 (10%) were accurately diagnosed using Swede score colposcopy and 2 cases (0.9%) were reported as LGL (CIN 1) by Swede score colposcopy.

Colposcopy by Swede score had a satisfactory sensitivity of 89.47% and specificity of 86.81% in the detection of CIN. Whereas in the detection of high-grade CIN (CIN 2+), Swede score colposcopy had a sensitivity of 91.67% and specificity of 99.49%. The positive predictive value, negative predictive value, with CIN 1 as the disease threshold were 78.16 and 93.98 respectively. The positive predictive value, negative predictive value in the detection of high-grade CIN (CIN2+) were 95.65 and 98.98 respectively. The 'k' value for the strength of correlation between colposcopic impression for CIN using Swede score and histopathology was k=0.73, for CIN 2+ it was k=0.92.

Colposcopy Impression	Frequency	Percent
Benign	133	60.45
LGL	64	29.1
HGL	23	10.45
Total	**220**	**100.0**

Table 1. Distribution of Study Participants based on Colposcopy Impression using Swede Score (n=220)

Biopsy Findings	Frequency	Percent
Benign	144	65.5
CIN 1	52	23.64
CIN 2	8	3.6
CIN 3	16	7.3
Total	**220**	**100.0**

Table 2. Distribution of Study Participants based on Biopsy Findings (n=220)

Colposcopy Impression Based on Swede Score	Biopsy Findings				
	Chronic Cervicitis	CIN 1	CIN 2	CIN 3	Total
Benign	125 (56.81%)	8(3.6%)	0	0	133 (60.45%)
LGL	18 (8.2%)	44 (20.0%)	2 (0.9%)	0	64 (29.1%)
HGL	1 (0.45%)	0	6 (2.7%)	16 (7.3%)	23 (10.45%)
Total	144 (65.46%)	52 (23.64%)	8 (3.6%)	16 (7.3%)	220 (100.0%)

Table 3. Distribution of Study Participants based on Biopsy and Colposcopy Findings (n=220)

DISCUSSION

The main goal of cervical screening is to identify women with moderate – severely dysplastic lesions (HSIL) which are considered to be the true precursors of invasive cancer and require treatment, thus ultimately decreasing morbidity and mortality due to cervical cancer. The Swede score is a new scoring system in colposcopy with score values 0, 1, 2 as the RCI but includes lesion size as the additional variable. It is simple to use, with no major learning curve, can be used by any grade of colposcopist.

Swede score Colposcopy and directed biopsy provides a histopathological diagnosis and colposcopic impression provides information concerning the lesion size and location, which forms the basis for additional management. The use of this scoring and grading system may guide colposcopic interpretation so that higher grade lesions are not missed and trivial findings are not over interpreted.

Colposcopy was performed and impression was noted according to Swede score. Diagnostic efficacy of colposcopy using Swede score in the detection of CIN, high-grade CIN were estimated and the colposcopic impression using Swede score was correlated with histopathology. The main strength of the present study is the large sample size and the biopsies were performed in all participants irrespective of the presence or absence of a lesion on colposcopy. A single expert pathologist reviewed all biopsies. The mean age of study participants was 43.6 ± 7.47 years which is almost in relation to a study by Ranga et al.[13]

Colposcopy by Swede score had a satisfactory sensitivity of 89.47% and specificity of 86.81% in the detection of CIN. Whereas in the detection of high-grade CIN (CIN 2+) Swede score colposcopy had a sensitivity of 91.67% and specificity of 99.49%. When the threshold was raised to CIN 2, the specificity was more (99.49%) compared to that of CIN 1 as the disease threshold (86.81%). Confusion among CIN 1, cervicitis and HPV infection may account for inaccuracy of diagnosis of low grade lesion by colposcopy.

The positive predictive value, negative predictive value, with CIN 1 as the disease threshold were 78.16 and 93.98 respectively. Comparatively lower positive predictive value means that all such lesions should be confirmed by the diagnostic test. The positive predictive value, negative predictive value in the detection of high-grade CIN (CIN2+) were 95.65 and 98.98 respectively. The predictive value of colposcopy was also shown to be better with increasing grades of neoplasia and this implies that colposcopy performs better in the diagnosis of high-grade lesions. The 'k' value for the strength of correlation between colposcopic impression for CIN using Swede score and histopathology was k=0.73, for CIN 2+ it was k=0.92. The accuracy rate in detecting CIN was 87.7. The accuracy rate in detecting CIN2+ was 98.6. There was a good strength of correlation between colposcopic impression using Swede score and histopathology in our study. The degree of correlation with histopathology was excellent for HGL lesions as compared to LGL lesions.

Nessa et al[14] evaluated cervical lesions in women with abnormal VIA findings using Swede score by Gynocular and colposcope. The cut-off value of 5 and greater for Swede score by the colposcope had a sensitivity of 83.3% (95% CI, 65.3%–94.7%) and specificity of 24.2% (95% CI, 17.9%–31.5%)

Nessa et al[15] evaluated the accuracy in detecting cervical lesions by nurses versus doctors using a stationary colposcope and gynocular. Colposcope by doctors had a sensitivity of 83.3%, and specificity of 22% in detecting CIN

2+ lesions at a cut-off ≥ 5 for Swede score. Evaluation by gynocular also showed similar sensitivity and specificity.

Kallner HK et al[16] evaluated the diagnostic accuracy of cervical lesions by stationary and gynocular. At a cut-off 5 for Swede score, stationary colposcope had a sensitivity of 73.5% and specificity of 58.5%.

Ranga et al[13] evaluated cervical lesions in women with abnormal screening result (Pap smear with atypical squamous cells of undetermined significance (ASCUS) or worse, positive HPV deoxyribonucleic acid, positive VIA or visual inspection with Lugol's iodine, or suspicious-looking cervix). The Swede score at a cut-off 5 or higher had a Sensitivity 100% (95% CI, 89.6%–100%); specificity 88.37% (95% CI, 79.9%–93.6%); PPV 76.74% (95% CI, 62.2%–86.8%); NPV 100% (95% CI, 95.2%–100%) in detecting CIN 2+.

CONCLUSION

Colposcopy using Swede score has satisfactory diagnostic efficacy when CIN 1 is used as a disease threshold. Colposcopy impression using Swede score with high sensitivity and specificity is a good screening test in cervical cancer especially in detecting high-grade CIN.

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