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Analysis of Screening and Diagnostic Techniques for Abnormal Cervices

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Abstract | **Original Research Article**

Introduction: Cervical cancer continues to consume lives of millions. The realization that early detection can lead to cure has imbued research in screening and diagnostic techniques: the result -3 marvelous tools for early cancer detection, namely Pap test, Colposcopy and HPV Test. ***Materials & methods:*** A cohort study was conducted in the Department of Obstetrics and Gynaecology at North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS) during the period from June 2013-2014. A total number of 100 women who attended Gynaecology outdoor of NEIGRIHMS were evaluated for unhealthy cervix. First patient was subjected to Pap test, followed by colposcopy and HPV test. HPV Test was done on tissue samples obtained through colposcopy directed biopsies and endocervical curettage in suspected cases. *Results & Observations:* The sensitivity and specificity of Pap test in our study was 45.45% and 92.3% respectively. The sensitivity and specificity of the colposcopic directed biopsies in this study was 90.9% and 65.71%. HPV testing in our study yielded a sensitivity and specificity of 81.82% and 97.44%. ***Conclusion*:** Although HPV testing in women older than 30 year has an average sensitivity and specificity of 89 and 90 per cent, the cost of the test bounds its use as a primary screening tool for cancer cervix. Hence, it can be reserved for high resource settings and cytology still remains the choice in poor resource settings.

Keywords: Abnormal cervix; cytology; colposcopy; HPV.

INTRODUCTION

Science is the magic wand that has made birth easy and death difficult. Yet even in this era of science the news of cancer comes as an annihilating storm. Cancer cervix is an ogre that can tarnish the joys of womanhood. It is a slow-to-develop disease in an easy-to-examine part of the body. It gives early warning signs—abnormal cell changes, for several years before an invasive and potentially fatal cancer develops. This long phase of pre-invasive disease is characterised microscopically as a spectrum of events progressing from cellular atypia to various grades of dysplasia or Cervical Intraepithelial Neoplasia (CIN) before progression to invasive carcinoma. The proportion of severe dysplasia and carcinoma in situ that progress to invasive cancer is approximately 10-30% in 5-10 years time. [1]Although there are inadequate data pertaining to the incidence rate of cancer cervix in Meghalaya, it would not be overzealous to expect a handsome number of cervical cancer patients in this population as early marriage and multi parity is common in Meghalaya. Cervical cancer is a horrible disease that continues to consume lives of millions. The realization that early detection can lead to cure has imbued research in screening and diagnostic techniques: the result-3 marvelous tools for early cancer detection, namely Pap test, Colposcopy and HPV Test.

MATERIALS & METHODS

This was a cohort study conducted in the Department of Obstetrics and Gynaecology at North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS) during the period from June2013-2014. A total number of 100 women who attended gynaecology outdoor of NEIGRIHMS were evaluated for unhealthy cervix. They were selected at random on the basis of the following criteria: Age > 30years, sexually active, presenting with gynaecological complaints and abnormal cervix on per speculum examination. Women<30 years already diagnosed with cancer cervix, hysterectomised women and pregnant women were excluded from the study. Women fulfilling the inclusion criteria were invited to participate in the study. Subject information material and consent forms were read out to the subjects before obtaining their signature or left thumb impression. A

detailed socio-demographic (including the Kuppuswamy socio-economic scale) and reproductive history was obtained in a structured questionnaire. Patient was explained about the procedures. Privacy was maintained during the examination. First patient was subjected to Pap test, and then colposcopy and HPV test were done successively. Pap results were reported according to the Bethesda System. Colposcopy was performed employing Reid's Colposcopic Index. HPV Test was done on tissue samples obtained through colposcopy directed biopsies and endocervical curettage in suspected cases. The technique employed was Polymerase Chain Reaction (PCR). Samples were tested only for HR-HPV 16 and 18.

RESULTS& OBSERVATIONS

Table-1: Descriptive diagnosis (cytopathology)

Cytological diagnosis	No. of cases
Infection(bacterial vaginosis) Inflammation	4(4%) 78(78%)
Epithelial cell abnormality (a)squamous cell ASCUS	 6(6%)
LGSIL HGSIL	4(4%) 4(4%)
Frank squamous carcinoma	2(2%)
(b) glandular cell Non epithelial malignant neoplasm	0 0

Table-2: Colposcopic and histopathological findings correlation

Diagnosis	Colposcopy	Histopathology
CIN I	28(30.43%)	6(6.52%)
CIN II	4 (4.34%)	4(4.34%)
CIN III	4 (4.34%)	4(4.34%)
Invasive carcinoma	8 (8.69%)	8(8.69%)

Table-3: Detection of HPV 16/18 in the study subjects

HPV 16/18 status	No.of cases
HPV detected	20(20%)
HPV not detected	80 (80%)

Table-4: Detection of HPV in pre-cancerous or cancerous lesions

Condition of cervix	No. of cases	HPV detected	Percentage
Pre-cancerous/cancerous	22	18	81.82
Non pre-cancerous/ non-cancerous	78	2	2.5

Table-5: Statistical analysis of the study data

Parameter (95%CI)	Pap test	Colposcopy	HPV test
Sensitivity	45.45% (16.92 - 17.50)	90.91% (58.67 - 98.49)	81.82% (48.24 - 97.18)
Specificity	92.31% (79.11 - 98.30)	65.71% (47.79 - 80.85)	97.44% (86.47 - 99.57)
Positive predictive value	62.5% (24.70 - 91.03)	45.45% (24.42 - 67.77)	90.00%% (55.46 - 98.34)
Negative predictive value	85.71% (71.45 - 94.54)	95.83% (78.81 - 99.30)	95% (33.02 - 99.24)
Likelihood ratio positive	5.91 (1.67 - 20.94)	2.65 (1.62 - 4.35)	31.91 (4.52 - 225.33)
Likelihood ratio negative	0.59 (0.34 - 1.02)	0.14 (0.02 - 0.91)	0.19 (0.05 - 0.65)
Relative Risk	4.3 (1.75 - 10.92)	10.9 (1.51 - 78.46)	18 (4.58 - 70.61)

The present study was undertaken in Dept. of Obstetrics and Gynaecology, NEIGRIHMS involving 100 cases. Our idea was to evaluate abnormal looking cervices on per speculum examination using the three

tests- Pap smear, Colposcopy and HPV test. In the present study, cytopathology detected ASCUS 6 cases, LGSIL 4cases (4%), HGSIL 4(4%) and 2 detected to be malignant giving a point prevalence of 2% i.e. 20 per 1000. 2 case smear were not satisfactory. Colposcopic examination could not be done in 8 cases due to non visibility of entire squamo-columnar junction due to narrow cervical canal. After application of 5% acetic acid solution, indistinct aceto-whitening was seen in 64 cases, off white or intermediate whitening in 16 cases and oyster whitening in 12 cases. After application of Lugol's iodine solution, there was iodine uptake in 48 cases. There was partial iodine uptake in 30 cases and no iodine uptake in 14 cases. On colposcopic examination28 (30.43%) cases diagnosed to be CIN I, 4(4.34%) CIN II, 4(4.34%) cases CIN III and 8 (8.69%) cases frank carcinoma. Histopathological examination detected 6(6.52%) CIN I, 4cases (4.34%) CIN II, 4cases (4.34%) CIN III and 8cases (8.69%) frank carcinoma. 24 cases of cervicitis, 6 cases of LG SIL, 8 cases of HG SIL and 8 cases of invasive carcinoma were detected. In rest 46 cases biopsy/endocervical curettage was not done.

In the present study, HPV was detected in 9 out of 11 cases of dysplasia and cancerous lesions was detected in 2 out of 3 cases of CIN I(66.67%), 3 out of 4 cases of CIN II & III(75%) and all 4 cases of invasive cancer(100%).1case of HPV was detected in non dysplastic lesion.

DISCUSSION

In the present study, 2 cases were detected to be malignant giving a point prevalence of 2% i.e. 20 per 1000 whereas in Schneider's [2] study it was 1.2% i.e. 12 per 1000 and in Rao *et al*. [3] study it was 1.5% i.e 15 per 1000. The higher rate of cancer detection in our study may be because of the fact that it was targeted at symptomatic women who had unhealthy cervices on per speculum examination.

In our present study colposcopic examination could not be done in 8 cases due to non visibility of entire squamo-columnar junction due to narrow cervical canal. A similar result where the upper limit of the transformation zone was out of sight in the endocervical canal was observed by Joel Coste [5] and Coppleson *et al.* [6] in 1978.

Then after application of normal saline by using green filter we observed diffusely distributed fine punctuation in 34 cases, fine punctuation and mosaic in 2 case, coarse punctuation and mosaic in 6 cases and coarse punctuation with atypical vessels in another 2 case. Normal vascular pattern was seen in 27 cases. After application of 5% acetic acid solution, indistinct aceto whitening was seen in 64 cases, off white or intermediate whitening in 16 cases and oyster whitening in 24 cases. 24 cases of cervicitis, 6 cases of LG SIL, 8 cases of HG SIL and 8 cases of invasive carcinoma were detected. In rest 46 cases biopsy/endocervical curettage was negative. After application of Lugol's iodine solution, there was iodine uptake in 48 cases. There was partial iodine uptake in 30 cases and no iodine uptake in 14 cases.

The malignancy rate was high in our study probably due to the different parameters used in selection of cases such as patients presenting with symptoms like leucorrhoea, irregular bleeding, post - coital bleeding and unhealthy cervix on clinical examination. So the present study was on hospital attending patients who had some sort of gynaecological complaints. High frequency of vaginal infection encountered in the study population together with poor personal hygiene, early marriage, high parity etc may play a causative role in the high incidence of malignancy in the study subjects.

In the present study an effort was made to correlate the significant colposcopic findings with their histopathological findings. For this purpose cervical biopsy was performed for all suspicious lesions. In our study the commonest histopathological diagnosis was chronic cervicitis (40%) which is similar to Wills S, Azhagammai, Kanthamani PN [7].

In the present study, HPV was detected in 18 out of 22 cases of dysplasia and cancerous lesions i.e 81.82% and only in 2out of 78 cases of non dysplastic/cancerous lesions i.e 2.25% prevalence in normal. This is similar to the work of Castle P E [8] that showed that in India the prevalence of HPV infection are 6.6% in the general population and the prevalence of HPV 16 and 18 in women with cervical cancer 76.7%11. In the present study, HPV was detected in 4out of 6 cases of CIN I (66.67%), 6 out of 8 cases of CIN II & III(75%) and all 8 cases of invasive cancer(100%). In Bhatla N *et al*. [9] study, these percentages were 45.4%, 65.7% and 96.2%. The higher values in our study could be because of the fact that most women diagnosed with cancer in our study were less than 45 years.

In a meta-analysis of 12 studies with the least biased estimates, sensitivity ranged from 30% to 87% and specificity ranged from 86% to 100%. The sensitivity and specificity of Pap test in our study was 45.45% and 92.3% respectively.

The sensitivity and specificity of the colposcopic directed biopsies in this study was 90.9% and 65.71%, which was comparable to that of the study which was done by Sukhpreet L Singh *et al*. [10] i.e., 91% and 58.2%.

HPV testing in our study yielded a sensitivity and specificity of 81.82% and 97.44%. In Neerja Bhatla & Nidhi Moda's study [11], women older than 30 year

had an average sensitivity and specificity of 89% and 90%.

CONCLUSION

Cytology is an accepted method for screening for cervical neoplasia. Colposcopy may be utilized mainly in the evaluation of patients with abnormal smears because of the low sensitivity and false negative cytology and also poor compliance for follow up. Although HPV testing in women older than 30 year has an average sensitivity and specificity of 89 and 90 per cent, the cost of the test bounds its use as a primary screening tool for cancer cervix. Nevertheless, the high sensitivity of HPV test that allows prolongation of test interval is particularly important in settings of affluent societies. Hence, it can be reserved for high resource settings and cytology remains the choice in poor resource settings.

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