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Comparison of Visual Inspection with Acetic Acid Directed CervicalBiopsyand Endocervical Curettage to Colposcopy Directed Biopsy and Endocervical Curettage in Cervical Cancer Screening.

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Abstract:*A prospective observational study included 100 women with unhealthy cervices who attended outpatient department in 150 bedded Government Victoria Hospital a maternal hospital affiliated to Andhra medical College, Visakhapatnam, from January 2016 to December 2016.*
In the present study maximum patients (48%) were in the age group of 30-39 years,67% belonged to the Hindu religion and 78 % belonged to Class IV and Class V socioeconomic status,54% were Multi and Grandmulti Parous.69% got married below the age of 19 years, most common presenting symptom was leucorrhoea (65%)most common cytological observation was inflammatory smear (73%),most common colposcopic finding was aceto white epithelium(70%).most common vascular pattern was punctuation, and most common ECC observation was inflammatory (52%),and most common histological observation was chronic nonspecific cervicitis.14% of subjects positive for malignancy in group A and where as 18% were positive for malignancy in group B.
In Group-A *(Endocervical curettage +Visual inspection with acetic acid directed biopsy+visual random biopsy) Sensitivity is 69.23%. Specificity is 86.49%. Positive predictive value is 64.2%. Negative predictive value is 88.89%.*
In Group-B *(Endocervical curettage +colposcopic directed biopsy)*
Sensitivity is 76.92%. Specificity is 78.38%. Positive predictive value is 55.56%. Negative predictive value is 90.62%.
Key words: *Carcinoma Cervix, Visual inspection, Cytology, Colposcopy, Biopsy.*

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I. Introduction:

Cancer of cervix is the second most common cancer in woman worldwide and is the leading cause of cancer-related death among women in developing countries, where more than 80% of new cases occur. Cervical cancer continues to be the most common genital tract malignancy in India. Cancer of cervix is preceded by recognizable precancerous histological and cytological changes which provides opportunity for early detection of cervical neoplasm (1, 2).

In urban areas, cancer cervix account for over 40% of cancers while in rural areas it accounts for 65% cancers as per the information from cancer registry in Barshi.Invasive cancer of the cervix is considered preventive because of its easy visualization and it has got long pre-invasive state and availability of cervical screening programs and effective treatment for pre-invasive lesions (5).

At present, in the developing countries, 80-85% of women with cervical cancer present to the treatment centers at advanced stages, when treatment no matter how sophisticated, fails to improve survival time. The objective of the downstaging approach is to improve the stage distribution of cervical cancer at the time of diagnosis with the aim of improving prognosis.

Detection of cancer cervix is easily possible by screening methods like Pap smears, endocervicalbrush, and visual inspection with acetic acid, colposcopy and colposcopy guided biopsies. These methods are simple OPDbased proceduresand can be done without anesthesia.

Cervical cytology is the accepted method of screening for cervical cancer all over the world but it has low sensitivity. In the presence of an abnormal Pap smear, a tissue diagnosis is essential before proceeding with definitive therapy. Although cytology is accurate in predicting severity of cervical lesion, it cannot determine

their location or extent. A random cervical biopsy in the absence of visible lesion may result in a false negative histologic diagnosis (3).

With the introduction of colposcope, comparative studies substantiated that it was possible by colposcopic examination to accurately localize the area of abnormal cervical epithelium for the selection of biopsy site. Colposcopy as an adjunctive screening test has high sensitivity and can provide immediate results for evaluation of cervical lesions. Executing targeted biopsy, colposcopy can be useful in defining diagnosis of preinvasive lesions and carcinoma of cervix (4, 5).

II. Materialsand Methods:

The present study was conducted at Government Victoria Hospital for Women and Children, Department of obstetrics and gynecology, Andhra Medical College, Visakhapatnam, Andhra Pradesh.

100 women with unhealthy cervices who fulfilled inclusion criteria were studied. The study period was from January 2016 to December 2016.

All married women between age group of 18-60 years, whoattended the outpatient department of OBG with symptoms of leucorrhea, pain abdomen, dyspareunia, irregular periods, post coital bleeding, and prolapse uterus were examined in post menstrual period and were subjected for concurrent Pap smear examination, colposcopy and directed biopsy following informed consent. Teenage girls and Women on oral contraceptive pill usage, pregnant women and women without cervix were excluded from the study.

Detailed history regarding age, age at marriage, religion, parity, age at first pregnancy, menstrual history, history of presenting symptoms was taken. A complete clinical gynecological examination was performed in all women including Pap smear and were divided into two groups each 50 patients. **Group A (50)** Visual inspection of cervix with acetic acid directed biopsy plus visual random biopsy plus endocervical curettage and **Group B (50)** colpocsopic guided biopsy plus endocervical curettage done and results were analyzed. Histology of colposcopically directed biopsy was taken as gold standard to evaluate the performance of the test.

Aims and Objectives:

1. To evaluate the performance of visual inspection of cervix with acetic acid plus random cervical biopsy and endocervical curettage to colposcopy guided biopsy and endocervical curettage in cervical cancer screening by comparing the findings of 100 women with unhealthy cervix
2. To assess the utility of visual inspection of cervix with acetic acid in detecting the pre malignant and malignant lesions of the cervix in low resource settings

III. Observation and Results

The descriptive analysis of the study group is done and the results of the study are as follows:

100 women with unhealthy cervices on speculum examination included in this study were subjected to Pap smear, visual inspection with 3% acetic acid, endocervical curettage, and colposcopy guided biopsy.

Table 1: Distribution of Cases by Age

AGE GROUP	Number of Patients	Percentage
Less than 19	3	3%
20-29	24	24%
30-39	48	48%
40-49	19	19%
50-59	6	6%
TOTAL	100	100%

48% of the patients belonged to the age group between 30-39 years, 24% of the patients belonged to 20-29 years of age, 19% of the patients were between 40-49 yrs. 6% of the patients were between 50-59 yrs. and 3% of the patients were less than 19 years of age.

Table 2: Distribution of Cases by Religion

RELIGEON	Number of Patients	Percentage
HINDU	67	67%
MUSLIM	18	18%
OTHERS	15	15%
TOTAL	100	100%

67% of the patients were Hindus, 18% were Muslims and 15% of the patients were from other religions.

Table 3: Distribution of Cases by Socio-Economic Class:

CLASS	Number of Patients	Percentage
CLASS –I PROFESSIONALS	NIL	-
CLASS- II WHITE COLLORED JOB HOLDERS	4	4%
CLASS-III SKILLED WORKERS	18	18%
CLASS –IV SEMI SKILLED WORKERS	32	32%
CLASS V UNSKILLED	46	42%
TOTAL	100	100%

Majority of the patients were Class V who constituted 46%, followed by Class IV who constituted 32%. 18% were Class III, and 4% were Class II.

Table 4: Distribution of Cases by Age at Marriage

	Number of Patients	Percentage
Less than 19	69	69%
20-29	30	30%
More than 30	1	1%
TOTAL	100	100%

69% of the patients got married at an age of less than 19 years, 30% got married between 20- 29 years of age and only one patient got married at an age of more than 30 years.

Table 5: Distribution of Cases by Parity

PARITY	Number of Patients	Percentage
Nulliparous	6	6%
Less than 2	40	40%
2 and 4	48	48%
5 and above	6	6%
TOTAL	100	100%

48% of the women were between para 2 to 4, 40% of the patients were those who were less than 2 para, 6% of the women were para 5 and above, while 6% were nulliparous women.

Table 6: Distribution of Cases by Presenting Symptoms

SYMPTOMS	Number of Patients	Percentage
Leucorrhea	65	65%
Menstrual irregularities	18	18%
Pain abdomen/ dyspareunia	6	6%
Post coital bleeding	9	9%
Prolapse uterus	2	2%
TOTAL	100	100%

65% of the patients presented with Leucorrhoea, 18% presented with menstrual disturbances, 9% gave history of post –coital bleeding, 6% presented with pain abdomen and 2% had prolapsed uterus. Some of these patients had more than one complaint, in whom the major symptom was taken into consideration.

Table 7: Distribution of Cases by Cytology Observations (Pap Smear)

OBSERVATIONS	Number of Patients	Percentage
Normal smear	5	5%
Inflammatory	73	73%
Mild dysplasia	16	16%
Moderate dysplasia	1	1%
Severe dysplasia	5	5%
Positive for malignancy	0	0
TOTAL	100	100%

73% of the patients showed inflammation on cytology, 16% showed Mild Dysplasia, 5% had normal smears, 5% showed severe dysplasia.

Table 8: Histopathology Findings in Both Groups

Microscopic observations	GROUP – A Number of Patients	GROUP – B Number of Patients
Normal histology	10(20%)	5(10%)
Inflammatory	26(52%)	27(54%)
Mild/ Koilocytic changes	3(6%)	6(12%)

Moderate dysplasia	4(8%)	5(10%)
Severe dysplasia	4(8%)	2(4%)
Invasive carcinoma	3(6%)	5(10%)
TOTAL	50(100%)	50(100%)

IN GROUP-A Cervical biopsy revealed infection 52% of the cases, Normal histology in 20%, of cases, mild dysplasia in 6% of cases, moderate dysplasia 8% of cases, severe Dysplasia in 8% of cases, Invasive carcinoma in 6%.
IN GROUP-B Cervical biopsy revealed infection 54% of the cases, Normal histology in 10%, of cases, mild dysplasia in 12% of cases, moderate dysplasia 10% of cases, severe Dysplasia in 4% of cases, Invasive carcinoma in 10%.

Table 9: Distribution Of Patients by.Ecc Observation

GROUP-A			GROUP-B	
Observations	NUMBER	PERCENTAGE	NUMBER	PERCENTAGE
Normal smear	8	16%	6	12%
Inflammatory	28	56%	26	52%
Mild dysplasia	6	12%	6	12%
Moderate dysplasia	2	4%	6	12%
Severe dysplasia	4	8%	3	6%
Invasive carcinoma	2	4%	3	6%
TOTAL	50	100%	50	100%

IN GROUP-A 56% of the patients showed inflammation on cytology, 12% showed Mild Dysplasia,4% showed moderate dysplasia, 8% showed severe dysplasia, 4% showed invasive carcinoma,16% had normal smears,

IN GROUP-B 52 % of the patients showed inflammation on cytology, 12% showed Mild Dysplasia, 12% showed moderate dysplasia, 6% showed severe dysplasia, 6% showed invasive carcinoma, 12% had normal smears.

Table 10: Colposcopic Findings and VIA Findings

Appearances	COLPOSCOPY(GROUP-B)		VIA (GROUP-A)	
	Number	PERCENTAGE	Number	PERCENTAGE
Normal	2	4%	20	40%
Atypical TZ	27	54%	23	46%
Invasive carcinoma	2	4%	2	4%
Cervico vaginitis	10	20%	2	4%
Squamous metaplasia	6	10%	1	2%
Ectropy	2	4%	1	2%
Erosion	1	2%	1	2%
Total	50	100%	50	100%

IN GROUP- A 46% of the patients showed atypical TZ on VIA, 4% showed cervicovaginitis, 2% showed Squamous metaplasia; 40% had normal appearance on VIA, while 4% showed invasive carcinoma. Ectropion without metaplasia was seen in 2%, Erosion in 2.
IN GROUP- B 54% of the patients showed atypical TZ on colposcopy, 20% showed cervicovaginitis, 10% showed Squamous metaplasia; 4% had normal appearance on Colposcopy, while 4% showed invasive carcinoma. Ectropion without metaplasia was seen in 4%, Erosion in 2%.

Table 11: Analysis of Atypical TZ

	Colposcopic(GROUP-B)		**VIA (GROUP-A)**	
observation	NO OF PATIENTS	PERCENTAGE	NO OF PATIENTS	PERCENTAGE
Acetowhite epithelium	19	70.3%	20	86%
Punctuations	5	18.5%	2	8%
Mosaic	2	7.4%	1	4%
Atypical vessels	1	3.7%	0	0
TOTAL	27	100%	23	100%

Group-A Atypical Transformation zone was noted to be abnormal in 46% of the cases. In 86% of the cases Acetowhite epithelium was seen. In 8% of the cases, Punctations were seen, while mosaic pattern was seen in 4%, and atypical vessels were not seen.
Group-B Atypical Transformation zone was noted to be abnormal in 54% of the cases. In 70% of the cases Acetowhite epithelium was seen. In 18% of the cases, Punctations were seen, while mosaic pattern was seen in 7%, and atypical vessels were notice in another 3%. Some of the patients has multiple findings, which accounts

for the excess number in the above table. In 2% of the cases, there was no acetowhite epithelium, instead only atypical vessels were seen. This may be because of infection, which might have led to loss of epithelium.

Table 12: Analysis of abnormal cases in VDB+VRB+ECC group

S.NO	OBSERVATIONS	Number of patients (%)
1	ECC+HPE+	9(18%)
2	ECC+HPE-	5(10%)
3	ECC-HPE+	4(8%)
4	ECC-HPE+	32(64%)

- In 14 patients (28%) endocervical curettage positive for malignancy out of these 9 patients (18%) were also positive for malignancy by histopathological estimation.
- Remaining 5 patients (10%) were negative for malignancy in histopathological estimation.
- In 36 patients (72%) endocervical curettage negative for malignancy out of these 4 patients (8%) were positive for malignancy by histopathological estimation.
- Remaining 32 patients (64%) both endocervical curettage and histopathological estimation were negative for malignancy

Table 13: Analysis of abnormal cases in CDB+ECC group

S.NO	OBSERVATIONS	Number of patients (%)
1	ECC+HPE+	10(20%)
2	ECC+HPE-	8(16%)
3	ECC-HPE+	3(6%)
4	ECC-HPE+	29(58%)

- In 18 patients (36%) endocervical curettage positive for malignancy out of these 10 patients (20%) were also positive for malignancy by histopathological estimation.
- Remaining 8 patients (16%) were negative for malignancy in histopathological estimation.
- In 32 patients (64%) endocervical curettage negative for malignancy out of these 3 patients (8%) were positive for malignancy by histopathological estimation.
- Remaining 29 patients (58%) both endocervical curettage and histopathological estimation were negative for malignancy.

Table 14: Correlation of ECCwith**VDB+VRB** in The Diagnosis of Dysplasia and Malignancy (Group –A)

ECC	HPE POSITIVE	HPE NEGATIVE	TOTAL
POSITIVE CYTOLOGY	9	5	14
NEGATIVE CYTOLOGY	4	32	36
TOTAL	13	37	50

Statistics	Value	95% CI
Sensitivity	69.23%	38.57% to 90.91%
Specificity	86.49%	71.232% to 95.46%
Positive predictive value	64.29	35.142%to 87.24%
Negative predictive value	88.89	73.94% to 96.89%
P value <0.05		Statistically significant
False positive		30.77
False negative		13.51

Table 15: Correlation of**ECC**with**Colopscopic Directed Biopsies**in The Diagnosis of Dysplasia and Malignancy (GROUP-B)

ECC	HPE POSITIVE	HPE NEGATIVE	TOTAL
POSITIVE CYTOLOGY	10	8	18
NEGATIVE CYTOLOGY	3	29	32
TOTAL	13	37	50

Statistics	Value	95% CI
Sensitivity	76.92%	46.19% to 94.96%
Specificity	78.38%	61.79% to 90.17%
Positive predictive value	55.56	30.76%to 78.47%
Negative predictive value	90.62	74.98% to 96.02%
P value <0.05		Statistically significant
False positive		23.08
False negative		21.62

Table 16: Comparison of screening methods (VDB+VRB+ECC) and (CDB+ECC) in detecting cervical lesions

Screening method	Sensitivity (%)	Specificity (%)	PPV	NPV
VDB+VRB+ECC	69.23	86.49	64.29	88.29
CDB+ECC	76.92	78.38	55.56	90.62

Table 17: Comparison of demographic factors with other study

	M.Khan et., al	Present study
Age group(30-39 years)	41%	48%
Religion	87% Muslims	67%
Poor Economic status	79%	78%
Parity(more than 2)	51%	54%

IV. Summary

The present study was done over a period of 1year from Jan 2016 to Jan 2017. In the present study 100 women who attended the GynecologicalOutpatient Department Government Victoria Hospital for Women and Children Visakhapatnam and whose cervices were noted to be unhealthy clinically were subjected to cytology, colposcopy and directed biopsies.

Amongst these patients, majority (64%), who had abnormalities on cytology, colposcopy and colposcopic directed biopsies, belonged to 30—45 years of age, and they constitute 59% of the study group. In younger women, mild dysplasia with koilocytosis were observed and in older women with multi and grand- multi parity who constituted 54%. Severe dysplasia and malignancy were observed.

In patients who were between 30-45 yrs. of age severe dysplasia and malignancy were reported more in HPE in the presence of abnormal colposcopy and cytology 67% of the study group were Hindus, and 18% were Muslims. 15% of the study group belonged to other religions. Except on cytology, Colposcopy and HPE showed more abnormalities in Hindus. On Cytology out of 18% of Muslim study group, 21% showed dysplasia, where as in Hindus (67% of the study group), only 19% showed dysplasia. But on HPE, there was only 7% of dysplasia in Muslims. This may be because of infection.

Abnormalities on Cytology, Colposcopy and Colposcopic directed biopsies were more in Class IV and Class V socio-economic strata patients, who constituted 78% and in patients who were married at an early age, (<19 years), who constituted 69% of study group.

In patients who had leucorrhoea as the presenting symptoms (65%). Dysplasia on HPE was found in 25.4% and malignancy was found in 4.5%). Cytology was positive in 16% and abnormal colposcopy was seen in 55% of these patients.

Out of 9% of patients, who had Post-coital bleeding, 80% had abnormal colposcopy, 50% had positive cytology and 50% had dysplasia on HPE, and 33% had malignancy on HPE. This implies that patients with Post-coital bleeding and Leucorrhoea should be evaluated thoroughly

Patients with Menstrual disturbances constituted 18%, and they had more abnormal colposcopy (58%), but dysplasia on cytology 23% and HPE was 31.1%.

On histology, 13% had mild dysplasia with koilocyte change, 1% had moderate dysplasia and 6% had severe dysplasia and 3% had invasive carcinoma.

In 11 patients (22%) all three screening methods showed abnormal findings i.e., either dysplasia and / or malignancy.

In 2 patients (4%), only cytology and colposcopy were positive for dysplasia /malignancy. But biopsy reports were negative, which was taken as a reference for diagnosis.

In 15 patients (30%), though cytology was negative, colposcopic findings and biopsy reports were positive for dysplasia and/or malignancy.

In 5 patients (10%), cytology was positive for dysplasia but colposcopy and biopsy reports turned out to be negative.

In 26 (52%) women who had ATZ on colposcopy were negative for dysplasia malignancy on cytology and biopsy.

Only 2 patients (4%) had negative cytology and negative colposcopy but dysplasia was diagnosed by biopsy.

All the patients with normal colposcopic findings had normal histology, except for one patient, who was diagnosed as having cervico-vaginitis, the biopsy showed mild dysplasia with koilocyte atypia.

The colposcopy was more sensitive (87%) than the cytology (28%), whereas it's specificity was only 64% when compared to 89% on cytology.

A combined cytological, colposcopic evaluation is preferred, since it is highly accurate in predicting the degree of severity of the lesion. Cytology with colposcopy showed an accuracy of 28%, but cytology with colposcopic directed biopsies showed improved correlation of 39%, in detecting dysplasia and malignancy, thus cytology and colposcopy complement each other ideally.

V. Conclusion

In developing countries like India adequate coverage of the entire population by cytology-based screening programme is not at present feasible. Also, women generally are lost to follow-up.

Cervical cytology is the accepted method of screening for cervical cancer all over the world but it has low sensitivity. In the presence of an abnormal Pap smear, a tissue diagnosis is essential before proceeding with definitive therapy. Although cytology is accurate in predicting severity of cervical lesion, it cannot determine their location or extent. A random cervical biopsy in the absence of visible lesion may result in a false negative histologic diagnosis (3).

With the introduction of colposcope it was possible to accurately localize the area of abnormal cervical epithelium by colposcopic examination for the selection of biopsy site. Colposcopy as an adjunctive screening test has high sensitivity and can provide immediate results for evaluation of cervical lesions. Executing targeted biopsy, colposcopy can be useful in defining diagnosis of preinvasive lesions and carcinoma of cervix (4, 5). But in contrast to cytology, colposcopy has not achieved world-wide acceptance, as a screening modality, due to the inherent cost, and a need for wide availability of expertise. It is most often being used to evaluate patients with abnormal cytology.

In such a situation VIA is simple, inexpensive, low technology test that requires minimal infrastructure. VIA is a suitable primary screening alternative for a large population. Its high sensitivity, low costs and immediate results overcome the problem of loss-to-follow-up that occurs in cytology-based programme

Time has come to integrate VIA based screening program at the primary care level of health services and to down stage cancer cervix in our country. VIA directed biopsy when it is combined with visual random biopsy plus endo cervical curettage, the sensitivity and specificity increased. Thus can use in place of colposcopic guided biopsy plus endocervical curettage in detecting cervical lesions in low-resource settings.

Abbreviations

VIA	Visual inspection with Acetic acid
VRB	Visual random biopsy
CDB	Colposcopy directed biopsy
ECC	Endo cervical curettage
CIN	Carcinoma in situ
HPE	Histopathological examination
Pap smear	Papanicolaou's smear
TZ	Transformation Zone

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