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Cervical Cancer Screening By Cytology, Colposcopy and Their Correlation with Histopathology.

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I. Introduction

Cervical cancer being the leading cause of cancer deaths among women inIndia has a major impact on their lives. Although screening programmes in the developed nations are well established, it is estimated that 30% of cervical cancer cases will occur in women who never had a pap test. In developing countries this percentage approaches 60%. Every year in India, 122,844 women are diagnosed with cervical cancer, of which 70-80% are diagnosed in the advanced stage and 67,477 die from the disease .[1]

Also studies show that in developing countries 80%cases are incurable at the time of detection due to lack of screening.

Pap smear and colposcopy are the widely used screening techniques for cervical cancer worldwide.Pap smear detects abnormal cells while colposcopy locates the abnormal lesion and indicates the site of biopsy.

Colposcopy has a sensitivity of 60-75% for the detection of intraepithelial disease and when combined with exfoliative cytology, this sensitivity can be increased to >90%.[2]

Therefore, in the present study we had done cervical cancer screening in women with suspicious and unhealthy cervix by cytology, colposcopy and correlated them with colposcopy guided biopsies and calculated the sensitivity, specificity of each modality and intended to know whether the combination of both these techniques would be complementary to each other.

II. Materials And Methods

This was a cross sectional study carried out on 100 eligible women in the department of Gynecology, Siddhartha Medical College, Vijayawada from May 2018 to November 2018. We included married women aged between 18 – 55 years presenting with symptoms of leucorrhoea, pain lower abdomen, dyspaerunia, irregular menses, post coital bleeding, post menopausal bleeding and clinically unhealthy looking cervix in thestudy. Women with pregnancy, oral contraceptive pill usage, post hysterectomy and clinically evident cervical growth were excluded from the study.

After adequate counseling and obtaining informed consent, socio demographic data, clinical history were collected and a detailed clinical gynaecological examination performed including conventional pap smear using Ayre's spatula at the time of speculum examination. Subsequently colposcopy and guided biopsy was taken in all these cases. The specimens were sent to our Pathology laboratory and the reporting done as per modified Bethesda classification.

The results were analysed and the sensitivity, specificity of pap smear and colposcopy were calculated taking histopathological examination as the confirmatory method of either the abnormal smear or colposcopy.

III. Results And Analysis

Table -1.Age distribution of cases

Age group(years)	No. of cases	Percentage
<19	4	4%
20-29	32	32%
30-39	43	43%
40-49	16	16%
>=50	5	5%

Figure -1 Presenting complaints of cases

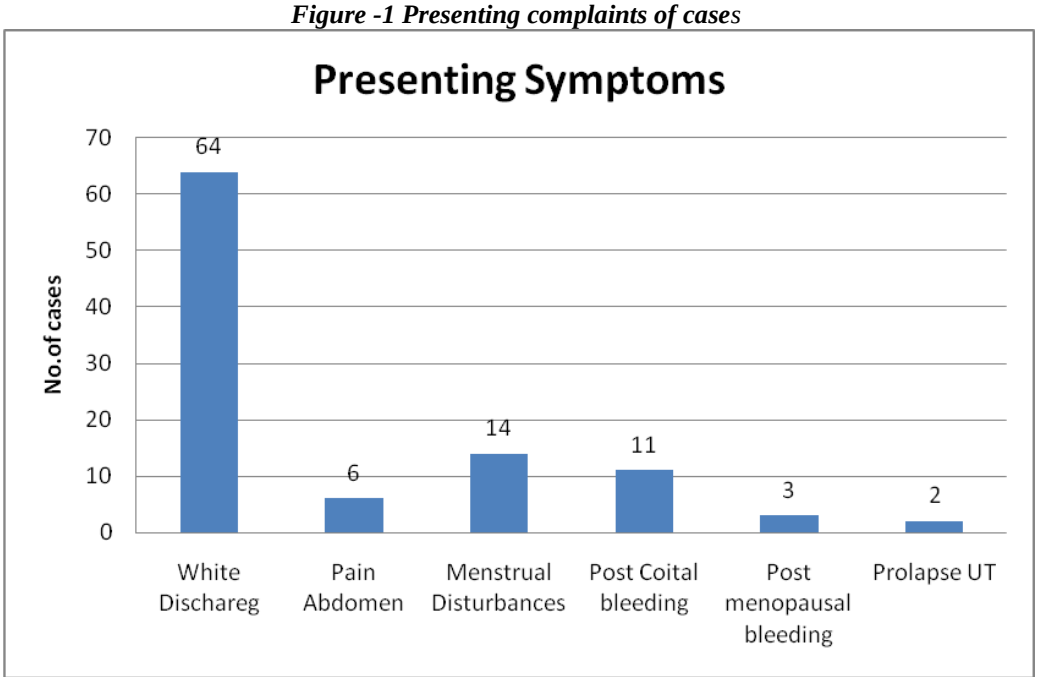

Table -2. Cytology reports

Observations	No. of cases	Percentage
Normal Smear	7	7%
Inflammatory	75	75%
Mild Dysplasia	12	12%
Moderate Dysplasia	2	2%
Severe Dysplasia	4	4%

Figure -2 Colploscopy findings

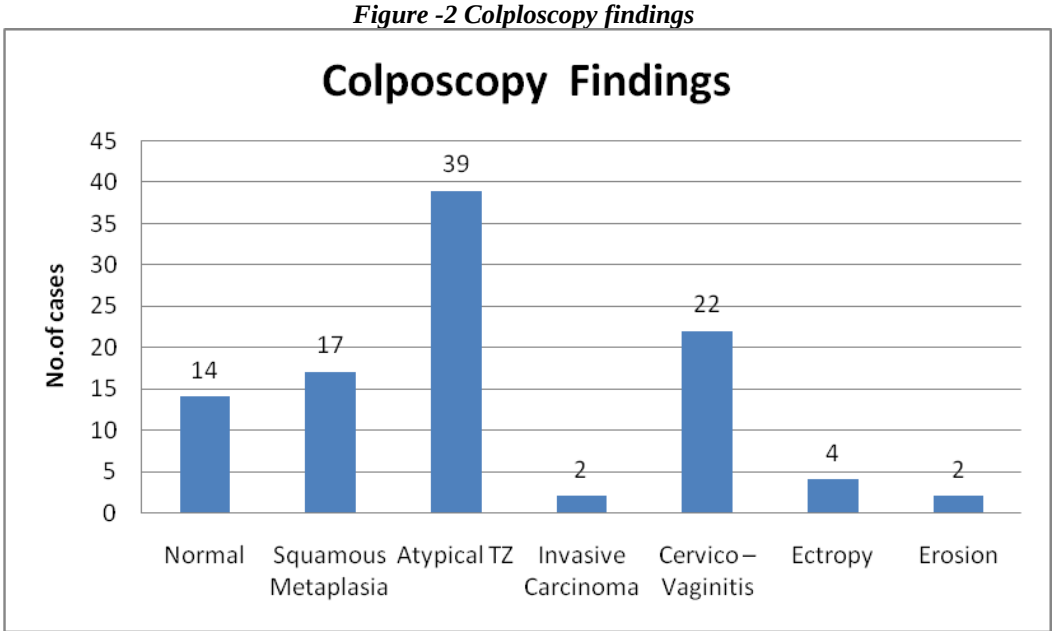

Figure -3. Analysis of atypical TZ

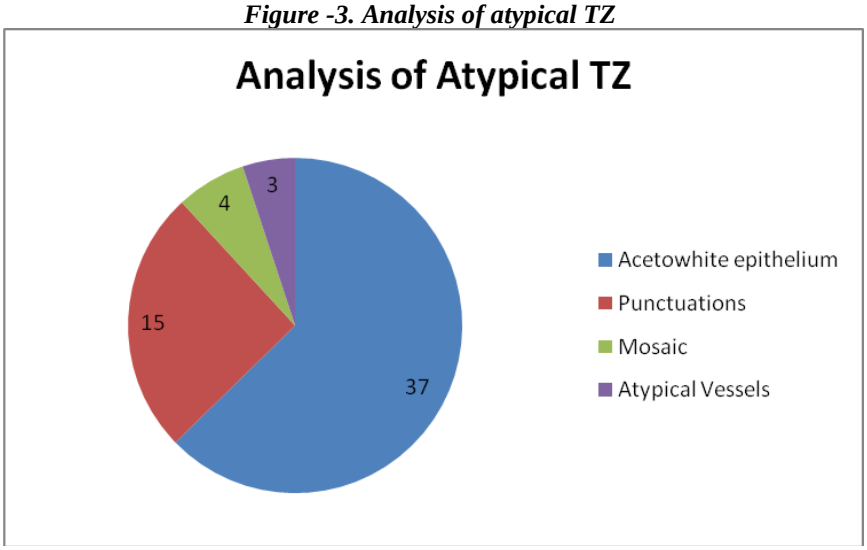

Table-3. Histopathologyobservations

Microscopic Observations	No. of cases	Percentage
Normal Histology	12	12%
Chronic non specific cervicitis	54	54%
Endocervicitis	1	1%
Mild Dysplasia /Koilocytic changes	15	15%
Moderate Dysplasia	6	6%
Severe Dysplasia	6	6%
Hyper plastic stratified squamous epithelium	4	4%
Invasive Cancer	2	2%

In this study 55 patients were found to be negative for dysplasia and malignancy while 45% of the patients had abnormalities of either positive cytology and /or ATZ and /or positive HPE as seen in Table -4

Table -4 Colpocytohistological correlation

S.No.		No.ofcases(%)
1	Cytology +ve Colposcopy +veHPE+ve	12 (26.6%)
2	Cytology +ve Colposcopy +ve HPE-ve	3(6.6%)
3	Cytology –ve Colposcopy +veHPE+ve	16(35.5%)
4	Cytology +ve Colposcopy -ve HPE-ve	3(6.6%)
5	Cytology –ve Colposcopy +ve HPE-ve	10(22.2%)
6	Cytology –ve Colposcopy -veHPE+ve	1(2.2%)
7	Cytology –ve Colposcopy -ve HPE-ve	55(55%)

Table – 5 .Validity of colposcopy with colposcopic guided biopsies (hpe) in the diagnosis of dysplasia and malignancy.

COLPOSCOPY	HPE POSITIVE	HPE NEGATIVE
POSITIVE	28 (a)	13(b)
NEGATIVE	1(c)	58(d)
TOTAL	29	71
Sensitivity = a/a+c	= 28/29	=96%
Specificity =d/b+d	=58/71	=81%
Predictive value=a/a+b	=28/41	=68%
False Positive=b/a+b	=13/41	=31%
False Negative=c/c+d	=1/59	=1%

Uncorrected p value =(51.07) = p<0.001Highly significant Corrected p value = (48.92) = p<0.001 Highly significant

Table – 6 validity of cytology with colposcopic directed biopsies (hpe) in the diagnosis of dysplasia and malignancy

Pap Smear	HPE Positive	HPE Negative
Positive Cytology	12(a)	6(b)
Negative Cytology	17(c)	65(d)
Total	29	71

Sensitivity = a/a+c	= 12/29	=41%
Specificity =d/b+d	=65/71	=91%
Predictive value=a/a+b	=12/18	=66%
False Positive=b/a+b	=16/18	=33%
False Negative=c/c+d	=17/82	=20%

Uncorrected p value =(15.126) = p<0.001extremely statistically significant Corrected p value = (12.97) = p<0.001 Highly significant.

Table –7: Validity of cytology with colposcopyin the diagnosis of dysplasia andmalignancy.

Pap smear	Positive Colposcopy	Negative Colposcopy
Positive	15(a)	3(b)
Negative	26(c)	56(d)
Total	41	59

Sensitivity = a/a+c	= 15/41	=36%
Specificity =d/b+d	=56/59	=94%
Predictive value=a/a+b	=15/18	=83%
False Positive=b/a+b	=3/18	=16%
False Negative=c/c+d	=26/82	=31%

Uncorrected p value =(16.263) = p<0.001extremely statistically significant

Corrected p value = (14.19) = p<0.001 Highly significant.

IV. Discussion

The main aim of screening for carcinoma cervix is to diagnose pre-invasive, pre- clinical cervical lesions. Cytology, colposcopy and cervical biopsies have their own advantages anddisadvantages in cervical cancer screening. They are complementary to each other. Hence, the combined simultaneous use of all three techniques can pick-up early cases which may be missed by any single method. Therefore in our present study we had screened 100 women with unhealthy cervices by cytology, colposcopy and confirmed them with guided biopsy to find out the efficacy of each modality.

Socio demographic data of these 100 women revealed that, 43% were in the age group of 30-39 years, 76% got married below the age of 19years, 64% were multi and grand multiparous, 78% belonged to the Hindu religion and 90% belonged to low socio-economic status. These findings correlate with the studies on epidemiological trends in cervical cancer wherein early age at first sexual intercourse, multiparity, low socio economic status are all proven risk factors for invasive cervical cancer.[3,4,5]

Cytological screening showed 7% of Normal smear , 75% of inflammatory smears, and 18% cases were dysplasia (out of which 12% mild , 2% moderate , 4% severe)

The results of present study were similar to the study done by RamaDevi E et al showing 50% inflammatory smears & 20% dysplasia cases (out of which 12% moderate , 8% severe)[6]

In the present study 37% cases showed colposcopic findings of aceto-white epithelium and 22% showed abnormal vascularity , 14% showed normal , 17% showed Squamous metaplasisa , 39% showed AtypicalTZ , 2% showed invasive carcinoma , 22% showed cervico-vaginitis , 4% showed Ectropy , 2% showed Erosion. In comparison to the study done by Srujana M et al showing 18% normal , 46% squamous metaplasia , 32% AtypicalTZ , 2% frank invasion & 2% unsatisfied.This disparity may be because of the criteria of the selection of cases and could be due to the variability in the assessment of colposcopic findings whereexperience is required. In the present study histopathology analysis showed 27% of dysplasiasand 2% of invasive cancers.[7]

When the validity of colposcopy was checked with biopsy, colposcopy had Sensitivity of 96% , Specificity of 81% , Predictive value of 68% , False positive of 31% , False negative of 1%. Colposcopy had high false positive rate (31%). This may be because of over estimation of colposcopic impression and very immature metaplasia can sometimes appear atypical and may be difficult to distinguish from dysplasias. Cervicitis may also sometimes present as aceto-white epithelium with finepunctuations.

Present study correlates with the study done by Gupta V et al showing , Sensitivity:76.47% , Specificity: 77.27% , Predictive value: 46.43% , Negative predictive value: 92.73% , False negatives: 25.53% ,

False positives: 22.73%.[8]

Cytohistological correlation obtained in this study is 41% and considerably lower than the colpohistopathological correlation of 96%.This probably may be due to the errors in collection technique, fixation, obscuring elements, presence of infection and tissue necrosis which interfere withinterpretation.

In this study cytology was under reported in some of the high grade lesions with false negative rate of 20% which was pretty much higher than colposcopy(1%). Nosignificant difference has been observed in false positive reports for colposcopy (31%) and cytology (33%). Same observations of Sensitivity: 29% , Specificity: 87% , Predictive value: 47% , False positive: 22% have been reported.

V. Conclusion

In the present study on cervical cancer screening by pap smear, colposcopy and their correlation with colposcopic directed biopsy, colposcopy was found to have sensitivity of 86% and specificity of 91%, while cytology had sensitivity of 41% and specificity of 91% which means to say that pap smear and colposcopy performed in the same visit would reduce the number of false negative cases thereby decreasing the false sense of reassurance to the women. Hence clubbing of pap smear and colposcopy would complement each other in diagnosing pre malignant lesions of cervix wherever resources permit in order not to miss out the abnormal cervical lesions.

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