

## Liquid Based Cytology as a Screening Tool in Carcinoma of Uterine Cervix: A Clinical Study

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### Abstract

### Original Research Article

**Background:** Cervical cytology is the cornerstone of cervical screening programmes. Its use in detecting cervical cancer cases at early stages has cemented its role and improved outcomes in these patients. The long pre-invasive period of the disease makes it possible to detect it early and hence, curtail its complications. **Aim:** To correlate the results of liquid based cytology with colposcopy guided biopsy results in women with unhealthy cervix and establish its efficacy in screening pre-malignant lesions of cervix. **Study Design:** A prospective, clinical study. **Materials and Methods:** All 121 women, between ages 21 to 65 years, with unhealthy cervix on per speculum examination, were subjected to Pap smear with liquid based cytology followed by colposcopic evaluation and guided biopsy. Following this the cytology results were compared with biopsy results. Women less than 21 years, more than 65 years, frank cases of carcinoma and mensurating women were excluded. The women presented to the Gynecological OPD with complaints of vaginal discharge, inter-menstrual bleed, pain abdomen, post-coital bleeding etc. **Results:** Sensitivity and specificity of liquid based cytology in our study was found to be 88.88% and 89.32%. Positive predictive value was 59.25% and negative predictive value was 97.87%. Accuracy was found to be 97.87%. This showed that liquid based cytology as a sensitive tool for detecting pre-malignant lesions of the cervix. **Conclusion:** The present study establishes the role of liquid based cytology as a screening modality for carcinoma cervix. Combination of cytology with colposcopy improves the rate of detection of carcinoma cervix in early stages.

**Keywords:** Cervical cytology, liquid based cytology, cervical cancer screening.

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## INTRODUCTION

Cervical cancer is one of the most common cancers in women in world and considerable mortality and morbidity is associated with it. The most common cause of cervical cancer is human papilloma virus, which is a sexually transmitted disease. Amongst the cervical cancer cases world wide, the prevalence of human papilloma virus is 99.7% [1]. Invasive cancer of cervix has a long pre-invasive stage making it amendable to screening and early treatment. Hence, Cancer of cervix is considered to be a preventable cause of death. It is well known that well-organized screening with cervical cytology has significantly reduced the incidence of morbidity and mortality due to cervical cancer in developed countries. Developed countries like United States have advanced screening programmes, where 85% of women had atleast one Pap smear in their lifetime whereas in developing countries this value is only 5 % [2]. The cervical cytology is a simple, safe,

non invasive and effective method of screening for carcinoma of cervix [3, 4]. In this study, it is taken in BD SurePath liquid based cytology system and the results were compared with that of colposcopy guided biopsies.

## MATERIALS AND METHODS

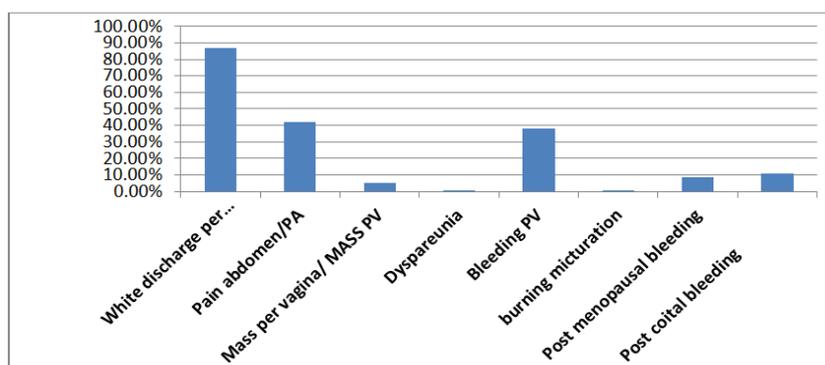
This prospective study was conducted in the Deptt. of Obstetrics and Gynecology, Gauhati Medical College, Guwahati, India, from 1<sup>st</sup> June, 2018 to 31<sup>st</sup> May, 2019. This was done after taking approval from Institutional Ethical Committee. The material of the present study was collected from women who met the inclusion criteria. Women less than 21 years, more than 65 years, frank cases of carcinoma and mensurating women were excluded. The women presented to the Gynecological OPD with complaints of vaginal discharge, inter-menstrual bleed, pain abdomen, post-coital bleeding etc. Written and informed consent was

taken from all patients. History and findings of clinical examination was recorded in the given proforma. Cervical smears were taken in BD Surepath liquid based cytology system. All women were also subjected to colposcopy and guided biopsy for histological finding. The biopsy specimen were stained with hematoxylin and eosin and examined under microscope. Results were analysed to find sensitivity, specificity, positive predictive value, negative predictive value and accuracy.

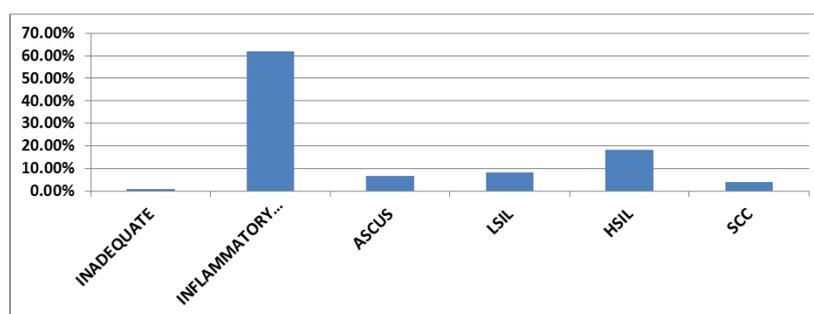
## RESULTS

In the current study women attending the Gynecological OPD in Gauhati Medical College and Hospital were subjected to cervical cytology, colposcopy and biopsy. The results were statistically analyzed and the following results were obtained. The study found that the peak age of occurrence of CIN was 31-40 years and mean age is 39.23+/- 10.7 years. Majority of women, that is, 66.94% are from the low

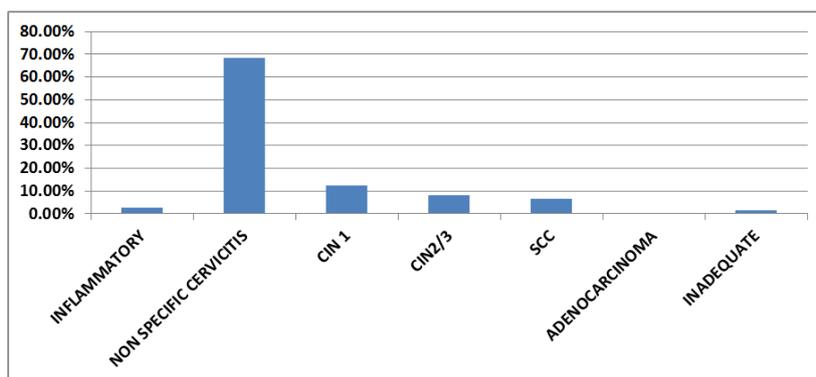
socio-economic class. Women hailing from the rural background accounted for 95.87% of the sample and 60.33% of the women were uneducated. Graph-1 shows the distribution of the sample according to the presenting complaints. Graph-2 shows the distribution of the findings of cervical cytology, the most common being Negative for Intra-epithelial lesion (According to Bethesda Classification, 2014). Out of 121 patients, 61.98% of patients had NILM on smears, 8.23% had LSIL, 6.61% has ASCUS, 18.18% has HSIL, 4.13% has SCC and 0.83% were inadequate. Graph-3 shows the distribution of histological results, the most common being chronic cervicitis. Table-1 shows the correlation of cervical cytology with histopathological results. In this study, the sensitivity and specificity of liquid based cytology was found to be 88.88% and 89.32 % respectively. The positive predictive value and negative predictive value was 59.32% and 97.87% respectively. Accuracy was found to be 92.03%.



Graph-1: Distribution of sample according to presenting complaints



Graph-2: Distribution of cervical cytology results amongst the sample



Graph-3: Distribution of histopathological findings in the sample

Table-1: Correlation of cervical cytology with histopathological results

CYTOLOGICAL FINDINGS	HISTOPATHOLOGICAL FINDINGS						
	INFLAMMATORY	CERVICITIS	CIN 1	CIN 2	SCC	ADC	IND.
INFLAMMATORY CELLS	2	64	7	0	0	0	2
ASCUS	1	6	1	0	0	0	0
LSIL	0	7	1	2	0	0	0
HSIL	0	5	6	8	3	0	0
SCC	0	0	0	0	5	0	0
INADEQUATE	0	1	0	0	0	0	0
ADENOCARCINOMA	0	0	0	0	0	0	0
TOTAL	3	83	15	10	8	0	2

## DISCUSSION

An attempt was made to compare the current study with those by various authors. In this study, the mean age was found to be 39.23+/- 10.7 years. This corresponded with Kalyankar *et al.*, who found the mean age as 36.5 years [5] and Ramadevi *et al.*, who found it to be 37.8 years [6]. Goyal *et al.*, found it to be 39.38 years [7]. In the present study, the most common complaint was that of white discharge. Choudhury *et al.*, found similar results (39%) [8]. In our study, the most common histo-pathological finding as chronic cervicitis. Similar results were found by various authors. Ramesh G *et al.*, found that 45% to be cervicitis [9]. Ramadevi *et al.*, found that 69% of cases had chronic cervicitis [6]. Joshi *et al.*, also found chronic cervicitis to be the most common finding (43%) [1]. Out of 27 cases which showed neoplastic changes on cervical cytology, 16 showed to be neoplastic on histopathology and hence, showed a strong correlation (0.0001) by Pearson correlation coefficient factor. Some cases were obscured by mucus and blood, and hence missed out the malignancy. Our study found the sensitivity and specificity of liquid based cytology as 88.88% and 89.32%. Ashmita *et al.*, found the sensitivity and specificity as 90.24% and 72.73% [10] respectively and Goyal *et al.*, found the sensitivity and specificity as 86% and 40.5% [7]. Joshi *et al.*, found sensitivity and specificity of cervical cytology as 65.38% and 95.83% [1]. Accuracy of liquid based cytology was 92.03%. Ashmita *et al.*, and Joshi *et al.*, found accuracy to be 86.54% and 80% [10, 1].

## CONCLUSION

Cytology testing is an excellent tool for diagnosing carcinoma of cervix, owing to its feasibility

in low resource settings. The sensitivity of liquid based cytology is not 100%, which can be compensated by advising the women to undergo repeated smears every three years.

**Conflict of Interest:** None.

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