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COMPARISON OF LIQUID-BASED CYTOLOGY AND CONVENTIONAL CYTOLOGY FOR EVALUATION OF CERVICAL PAP SMEARS

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Abstract

INTRODUCTION: This high mortality rate from cervical cancer globally can be reduced by an approach that includes prevention, early diagnosis, effective screening and treatment programmes. There are currently vaccines that protect against common cancer-causing types of human papilloma virus and can significantly reduce the risk of cervical cancer. in low socioeconomic or developing countries where screening programmes are not available, diagnosing cervical cancer at an early stage and providing access to effective treatment can significantly improve the likelihood of survival. Liquid-based cytology (LBC) was introduced at around mid-1990s as an alternative technique to process the cervical samples. After that most of the developed countries has switched from conventional Pap smear to LBC. LBC has been proposed to be beneficial than Pap smear because of less number of unsatisfactory smears

MATERIAL AND METHODS: This study comprises of 287 cervical samples from women visiting the Department of Obstetrics and Gynaecology over a period of 1 year. Samples were taken and divided into two parts by split-sample technique. Material was taken from the fornix, portio, and endocervix from all women. Slides for conventional cytology and LBC were stained according to the Pap method. LBC was considered representative if the slide contained >5000 epithelial cells. Endocervical cells were considered present if the slide contained ≥2 groups of glandular/metaplastic cells with ≥5 cells each or if the slide contained ≥10 dissociated glandular/metaplastic cells

RESULTS: 287 patients were included in the study. Epithelial cell abnormality was observed in 10 cases in conventional smear while in LBC it was 11. In conventional smear pap report of Unsatisfactory, normal, atrophic, altered flora and candida was in 21,193, 21, 46 and 10 cases respectively. In LBC pap report Unsatisfactory, normal, atrophic, altered flora and candida was in 15,214, 22, 44 and 13 cases respectively. Epithelial cell abnormality was seen in 10 (3.5%) cases by both the methods. Of these 10 cases low grade squamous intraepithelial lesion was observed in 2 cases, High grade squamous

intraepithelial lesion in one case, Squamous cell carcinoma in one case and atypical squamous cells of undetermined significance in 6 cases.

CONCLUSION: There was a similar detection rate of epithelial abnormalities and infections in both the methods. US rate of CPS was 7.3% and 5.2% for LBC. Thus LBC can be a superior test as compared to conventional pap smear but has to reconsidered in the low-resource setting.

Introduction:

Cervical cancer is the 4th most common cancer in women with an estimate of 570,000 new cases in the year 2018 making sum of around 6.6% of all female cancers. 90% of deaths from cervical cancer occurs in low- and middle-income countries. This high mortality rate from cervical cancer globally can be reduced by an approach that includes prevention, early diagnosis, effective screening and treatment programmes. There are currently vaccines that protect against common cancer-causing types of human papilloma virus and can significantly reduce the risk of cervical cancer. in low socioeconomic or developing countries where screening programmes are not available, diagnosing cervical cancer at an early stage and providing access to effective treatment can significantly improve the likelihood of survival. [i]. Risk factors for cervical cancer are early age at first sexual activity, multiple sexual partners, early age at first delivery, increased number of pregnancies, smoking, and immunosuppression[ii]. Cervical cancer prevention in resource-poor settings requires affordable and effective screening programs that are designed to incorporate communities and their needs[iii].

Sexually transmitted human papillomavirus (HPV) is the most important risk factor for cervical intraepithelial neoplasia and invasive cervical cancer[iv].

Liquid-based cytology (LBC) was introduced at around mid-1990s as an alternative technique to process the cervical samples. After that most of the developed countries has switched from conventional Pap smear to LBC. LBC has been proposed to be beneficial than Pap smear because of less number of unsatisfactory smears[v].

MATERIAL AND METHODS

The present prospective study was conducted in the department of pathology in collaboration with department of gynaecology at Vedanta Institute of Medical Sciences Dahanu, Palghar, Maharashtra. This study comprises of 287 cervical samples from women visiting the Department of Obstetrics and Gynaecology over a period of 1 year. Samples were taken and divided into two parts by split-sample technique. Material was taken from the fornix, portio, and endocervix from all women.Slides for conventional cytology and LBC were stained according to the Pap method.LBC was considered representative if the slide contained >5000 epithelial cells. Endocervical cells were considered present if the slide contained ≥2 groups of glandular/metaplastic cells with ≥5 cells each or if the slide contained ≥10 dissociated glandular/metaplastic cells[vi]. Samples were compared formorphology of various cells,US rates and sensitivity of two methods for detection of epithelial abnormalities as per the Bethesda system (TBS) 2001.

Informed consent was obtained from all the study cases. Uncorrected differences in proportions between groups were calculated with the chi-square test using SPSS software. P value was calculated wherever required. P value of 0.05 or less was considered as statistically significant.

RESULTS

A total of 287 patients were included in the study.

Table1: Pap report

Pap report	Number of cases (conventional smears) n=287	%	Number of cases (LBC) n = 287	%	Statistical analysis
Epithelial cell abnormality	10	3.5%	10	3.5%	Not significant
Unsatisfactory	21	7.3%	15	5.2%	Significant
Normal	193	67.2%	214	74.6%	Not significant
Atrophic	21	7.3%	22	7.7%	Not significant
Altered flora	46	16.0%	44	15.3%	Not significant
Candida	10	3.5%	13	4.5%	Not significant

Epithelial cell abnormality was observed in 10 cases in conventional smear while in LBC it was 11. In conventional smear pap report of Unsatisfactory, normal, atrophic, altered flora and candida was in 21,193, 21, 46 and 10 cases respectively. In LBC pap report Unsatisfactory, normal, atrophic, altered flora and candida was in 15,214, 22, 44 and 13 cases respectively.

Epithelial cell abnormality was seen in 10 (3.5%) cases by both the methods. Of these 10 cases low grade squamous intraepithelial lesion was observed in 2 cases, High grade squamous intraepithelial lesion in one case, Squamous cell carcinoma in one case and atypical squamous cells of undetermined significance in 6 cases.Squamous cell carcinoma case showedsimilar features in CPS and LBC samples with Diathesis as a characteristic feature. CPS samples showed excess of blood obscuring the morphology of tumour cells, while it wasmore clear in LBC samples.Main reason of unsatisfactory samples was insufficient cells.

DISCUSSION

Cervical cancer is an increasing health problem and an important cause of mortality in women worldwide. In developing countries like India, the incidence of cervical cancer is high and>80% of all the cervical cancer cases are found in developing and low-resource countries, because of a lack of awareness and difficulty in running cytology-based screening programs[vii].Early detection of cervical cancer and appropriate treatment are possible if screening tests are implemented properly[viii].Early cervical epithelial changes can be identified by a Pap smear test, which is the primary screening test for detection of early stage of invasive cervical cancer. Sensitivity of the Pap test in detecting a high-grade squamous intraepithelial lesion (HSIL) is 70.80%[ix].There is a need to carry out cervical cancer screening awareness programs, and motivate them to visit the hospital for a cancer screening.

In our study epithelial cell abnormality was observed in 10 cases in conventional smear. In conventional smear pap report of Unsatisfactory, normal, atrophic, altered flora and candida was in 21,193, 21, 46 and 10 cases respectively. In a study by SachanPLet al[x]48.84% of the cases were negative for malignancy and 42.66% had inflammation. The epithelial abnormalities ASCUS, LSIL, and HSIL were found in 2.90%, 5.09%, and 0.48% of the women, respectively. Unsatisfactory reporting found in 6.42%. Studies also reported 95% and 74.5% had inflammation indicated by the Pap smear test, respectively[xi], [xii].

In present study unsatisfactory smear (US) rate was reduced from 7.3% to 5.2% in LBC smears. The most common reason for U/S was low cellularity in both categories.The most common reason for US was low cellularity in both categories.other studies have also shown the US reduction in their studies[xiii], [xiv].

Fungalagents such as Candida were seen better or more easily on the LBC samples. Candidal hyphae were more easily identified in LBC. Similar findings were observed by Fitzhugh and Heller in their study[xv].

CONCLUSION

In this study LBC and conventional cytology was compared. There was a similar detection rate of epithelial abnormalities and infections in both the methods. US rate of CPS was 7.3% and 5.2% for LBC. Thus LBC can be a superior test as compared to conventional pap smar but has to reconsider in the low-resource setting.

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