Experience of cervical Pap smear screening in tertiary care hospital

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ABSTRACT

Background: Cervical cancer is the leading cause of death in women in developing countries like India. It is preventable by regular screening by Pap smear and can be detected at pre-invasive stage. Thus, reducing the morbidity and mortality related with cervical cancers. **Objective:** This study aims at detecting the prevalence and current trends of various epithelial cell abnormalities (ECAs) in females attending a tertiary care hospital. **Materials and Methods:** This is a retrospective study conducted in a tertiary care hospital between July 2015 and May 2019. A total of 15,270 cases comprising 11,494 conventional and 3776 liquid-based cytology Pap smears were included in the study. Clinical data and history of the patients were retrieved. All cases were reported according to Bethesda system 2014. **Results:** Among 15,270 cases, 793 Pap smears were unsatisfactory, 14,153 Pap smears were negative for intraepithelial lesion/malignancy, and 325 cases had ECA. **Conclusion:** Large hospital-based studies are required for proper implementation of health services and for the selection of a feasible as well as sensitive screening test for early detection of cervical dysplasias which can be helpful in decreasing the burden of cervical cancer in our community.

KEY WORDS: Cervical Cancer; Low-grade Squamous Intraepithelial Lesion; High-Grade Squamous Intraepithelial Lesion; Pap Smear

INTRODUCTION

Cervical cancer is the fourth most common cancer worldwide. It is the second most common cancer after breast cancer in India with 96,922 new cases and 60,018 deaths in 2018.[1] Female in developing countries generally visit to gynecology department only when symptomatic with pain abdomen, discharge per vaginum, or menstrual abnormalities.[2] Rarely, they come for routine screening for the detection of cervical abnormalities.

Cervical Pap smear is a sensitive, painless, cost effective, and outdoor patient department (OPD) procedure widely done for screening of cervical lesions. Cervical cancer is preventable by timely treatment of pre-invasive lesions. Routine Pap screening guidelines if followed results in significant decrease in morbidity and mortality associated with cervical cancers. Follow-up with repeat Pap in 6 or 12 months is done as per guidelines if any epithelial abnormality is present.[3] Many centers follow Bethesda system (2014) for Pap smear reporting, resulting in uniformity in reporting format.[4]

The present study aims to evaluate the spectrum of epithelial cell abnormalities (ECAs) in females attending a tertiary care hospital.

MATERIALS AND METHODS

This is a retrospective study done from July 2015 to May 2019 in a tertiary care hospital in urban area. All cases received in the department of pathology were included in this study. It was a mixture of cases coming for routine screening, incidental screening, as well as camp screening. A total of 15,270 cases comprising 11,494 conventional and 3776 liquid-based cytology (LBC) Pap smears were reviewed and reported by

experienced pathologists. LBC Pap smear was collected and stained by Surepath™ method, and conventional smear was stained by automated linear Pap Stainer. Evaluation of the Pap smears was done by the Bethesda system (2014).[4] Permission was granted by the ethical committee to conduct the study.

RESULTS

The most common age of presentation was the fourth decade ranging from 18 years to 89 years. The presenting complains were vaginal discharge, pain abdomen, abnormal uterine bleeding, fibroid uterus, and cervical polyp.

Out of 15,270 Pap smears, 793 (5.19%) smears were unsatisfactory for evaluation, 14,153 (92.68%) smears were negative for intraepithelial lesion/malignancy (NILM), and

Table 1: Evaluation of cervical Pap smear and pattern of ECA

Entity	Pap smears	
	Number	**Percentage**
Total cases	15,270	100
ASCUS	102	0.667
ASC-H	25	0.163
LSIL	56	0.366
HSIL	32	0.209
SCC	39	0.255
AGC-NOS	41	0.268
AGC-FN	21	0.137
Adenocarcinoma	9	0.059
NILM	14,153	92.68
Unsatisfactory	793	5.19

SCC: Squamous cell carcinoma, ECA: Epithelial cell abnormalities, ASCUS: Atypical squamous cell of undetermined significance, ASC-H: Atypical squamous cell cannot exclude HSIL, LSIL: Low-grade squamous intraepithelial cell lesion, HSIL: High-grade squamous intraepithelial cell lesion, AGC-NOS: Atypical glandular cell not otherwise specified, AGC-FN: Atypical glandular cells favoring neoplasia, NILM: Negative for intraepithelial lesion/malignancy
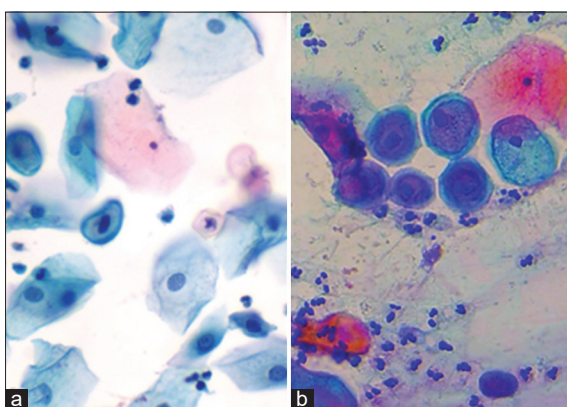
Figure 1: (a) Conventional Pap smear and (b) liquid-based cytology Surepath™. Papanicolaou stain, × 400, showing low-grade squamous intraepithelial cell lesion with koilocytes in center

325 (2.13%) Pap smears showed features of ECA [Table 1]. Among these 325 cases, maximum cases (102, 0.67%) were of atypical squamous cell of undetermined significance (ASCUS). There were 56 cases (0.37%) of low-grade squamous intraepithelial cell lesion (LSIL) [Figure 1a and b], 32 cases (0.21%) of high-grade squamous intraepithelial cell lesion (HSIL) [Figure 2a and b], 39 cases of squamous cell carcinoma [Figure 3], and 25 cases (0.16%) of atypical squamous cell cannot exclude HSIL (ASC-H). Glandular cell
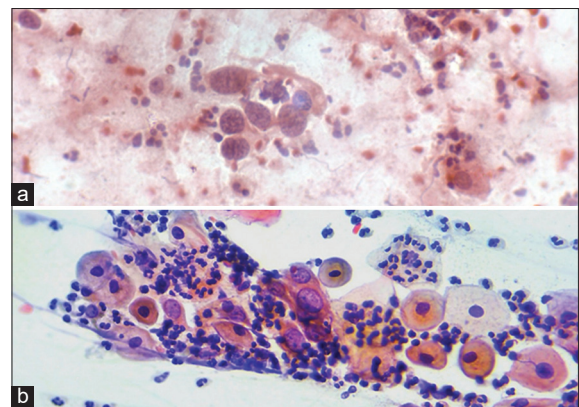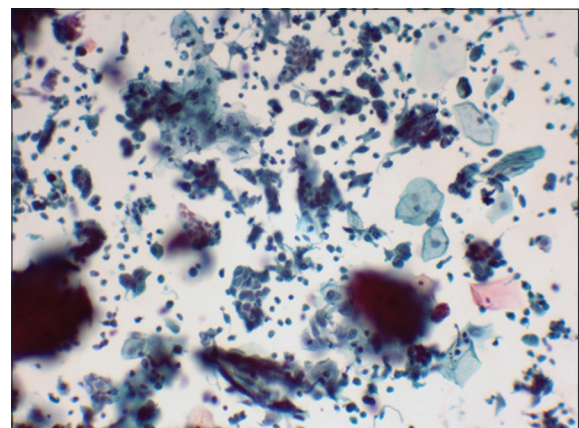

Figure 2: (a and b) Papanicolaou stain, × 400, conventional Pap smear showing high-grade squamous intraepithelial cell lesion with atypical parabasal cells

Figure 3: Papanicolaou stain, × 200, liquid-based cytology Pap smear showing squamous cell carcinoma with atypical squamous cells
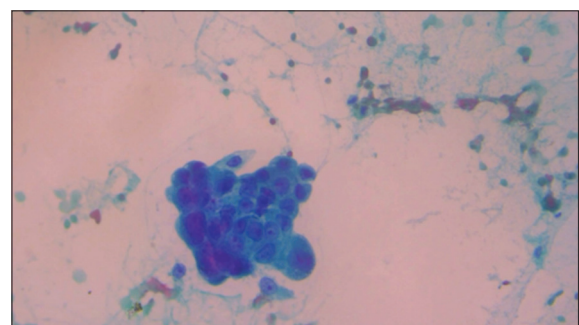
Figure 4: Papanicolaou stain, × 400, liquid-based cytology Pap smear showing adenocarcinoma not otherwise specified with atypical glandular cells

abnormalities were noted in 71 cases, of which 21 (0.137) were atypical glandular cell favoring neoplastic, 41 (0.27%) were atypical glandular cell not otherwise specified, and 9 cases (0.06%) were of adenocarcinoma [Figure 4 and Table 1].

Of the 14,153 NILM Pap smears, the most common finding was non-specific inflammation which was present in 3057 Pap smears. Among these 3057 inflammatory Pap smears, 423 were associated with infection with the most common infection being bacterial vaginosis in 294 followed by candidiasis in 74 cases. Forty-eight cases were of trichomonas vaginalis, five cases of herpes simplex virus infection, and two cases of microfilariasis.

DISCUSSION

Cervical cancer and breast cancer are the leading cause of mortality in developing countries like India.[1] Cervical cancer is the most common cancer for which a sensitive screening Pap test and screening guidelines are available. Routine Pap test when combined with human papilloma virus testing further increases the sensitivity to detect premalignant cervical lesions. This study included 15,270 Pap smears, of which the most common epithelial abnormality was ASCUS and least common was adenocarcinoma.

In studies conducted in rural India, Misra *et al.* (4279 females) and Nene *et al.* (79,449 females) reported the highest and lowest rate of ECA in 18.8% and 0.92% of cases, respectively.[5,6] The present study had ECA in 2.13% of cases which is approximated to 2.6% a study conducted by Lebani *et al.* (2.6%, 5032 females) and Satyanarayan *et al.* (2.6%, 7603 females), in 2014.[7,8] Low literacy rate and lack of medical facilities in rural area are one of the reasons for high rates of cervical cancer in rural Indian females.

Camp-based studies done in Barshi by Nene *et al.* found 0.009% (25 cases of cervical cancer in 2846 screened females) of cases with cervical cancer.[9] An another study by Karunakaran *et al.* found 0.6% of women with HSIL.[10]

The present study had 0.209% HSIL which was lower and 0.31% cervical cancer which was higher than that reported by Nene *et al.* and Karunakaran *et al.*, respectively. Patients usually attend to hospitals at later stages of disease which is responsible for higher rates of cancers in hospital-based studies than in camp-based studies. In these camp-based studies, the acceptance rate of young female to Pap smear was more than older females. This may be due to fear of diagnosis of a high-grade disease, lack of education, and awareness in older females.

A decrease in age-adjusted rate (AAR) of cervical cancer in India is shown by population-based studies. The recent data from NCRP (2009–2011) showed that cervical cancer has highest AAR of 24.3 in Aizawl district of Northeast India followed by Barshi and Bengaluru with AAR of 19.5 and 18.9, respectively. The lowest AAR of 5.6 for cervical cancer was noted in Dibrugarh district. In Delhi, the AAR was 15.4% which is high enough from the present study.[11]

The present study is a hospital-based study in an urban area, but the patients visiting the gynecology OPD are from both urban and nearby and far rural areas. The most common ECA seen in the present study was ASCUS in 0.667% of cases. A study by Gupta *et al.* (4703 females) also showed almost similar incidence of ASCUS (0.52%), but they had LSIL as the most common ECA in 1.36% of cases instead of ASCUS. Other hospital-based studies show ECA ranging from 0.3% to 2.3%.[12-21] Most of the studies showed that LSIL is the most prevalent ECA, whereas studies by Sengul *et al.* and Nair *et al.* showed maximum cases of ASCUS among the various ECAs.[18-20] The comparison of the present study with other hospital-based studies is done in the tabulated manner [Table 2].[12-21] The present study also had glandular cell abnormalities in 71 (0.46%) of cases which was not illustrated in other studies. Furthermore, ASC-H was underreported in other studies. This difference may be attributed to the difference in place of study, sample size, age, literacy, sexual activity, related infections, availability of screening program, as well as social and cultural differences.[12-21]

Table 2: Comparison of ECA with other hospital-based studies and present study

Studies	Number of cases	ASCUS %	ASC-H %	LSIL %	HSIL %	SCC %	AGC %
Present	15,270	102 (0.67)	25 (0.16)	56 (0.37)	32 (0.21)	39 (0.25)	71 (0.47)
Kothari *et al.*	36,740	0.11	-	0.83	0.31	0.05	-
Gupta *et al.*	4703	0.52	-	1.36	0.91	0.28	-
Nair *et al.*	2028	0.15		1.58	0.49	0.2	-
Sachan *et al.*	1650	2.90		5.09	0.48	-	-
Sengual *et al.*	1032	1.18		0.39	0.1	0.02	
Nayir *et al.*	1032	1.7		0.5	0.1	-	-
Shaki *et al.*	1100	4.0		6.8	6.0	2.3	-
Mandakini *et al.*	995	4.12		0.1	0.1	0.7	

SCC: Squamous cell carcinoma, ECA: Epithelial cell abnormalities, ASCUS: Atypical squamous cell of undetermined significance, ASC-H: Atypical squamous cell cannot exclude HSIL, LSIL: Low-grade squamous intraepithelial cell lesion, HSIL: High-grade squamous intraepithelial cell lesion, AGC: Atypical glandular cell

A hospital-based data are essential to estimate the prevalence of cervical premalignant and malignant cases and to detect the efficacy of ongoing screening test. Furthermore, it provides the actual burden of cervical dysplasia faced by the tertiary care hospitals, which provides information about the improvements to be done in various health schemes related to cervical cancer and provides estimate of required resources. However, the limitation of the study was that these cases were not histopathologically correlated and thus, sensitivity and specificity could not be evaluated. The present study highlights the importance of Pap smear as a screening test in decreasing the mortality and morbidity of cervical cancer by detecting them in premalignant stage and preventing their further advancement to malignant stage by timely treatment. Awareness of cervical cancer, availability as well as benefits of routine Pap smear screening, can further decrease the prevalence of malignant cases.[13,14]

CONCLUSION

Hospital-based and community-based data should be published so that effective screening and management strategies can be planned to decrease the burden of cervical cancer in India. As far as our knowledge, this is the second-largest hospital-based study published in Indian English literature.

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