International Journal of Clinical and Diagnostic Pathology

ISSN (P): 2617-7226
ISSN (E): 2617-7234
www.patholjournal.com
2020; 3(1): 390-395
Received: 07-11-2019
Accepted: 11-12-2019

Dr. Ruchi Nagpal
Assistant Professor, Department of Pathology, Bhaskar Medical College and General Hospital, Hyderabad, Telangana, India

Dr. Kasturi Kshitija
Associate Professor, Department of Pathology, Bhaskar Medical College and General Hospital, Hyderabad, Telangana, India

Dr. MNP Charan Paul
Associate Professor, Department of Pathology, Bhaskar Medical College and General Hospital, Hyderabad, Telangana, India

Dr. VV Sreedhar
Professor and Head of the Department of Pathology, Bhaskar Medical College and General Hospital, Hyderabad, Telangana, India

Dr. Kiran S Rajput
Assistant Professor, Department of Pathology, Bhaskar Medical College and General Hospital, Hyderabad, Telangana, India

Dr. Nageshwar R Suragani
Senior Resident, Department of Pathology, Bhaskar Medical College and General Hospital, Hyderabad, Telangana, India

Corresponding Author:
Dr. Kasturi Kshitija
Associate Professor, Department of Pathology, Bhaskar Medical College and General Hospital, Hyderabad, Telangana, India

A study on cervical pap screening with clinical correlation in a tertiary care hospital

Dr. Ruchi Nagpal, Dr. Kasturi Kshitija, Dr. MNP Charan Paul, Dr. VV Sreedhar, Dr. Kiran S Rajput and Dr. Nageshwar R Suragani

DOI: https://doi.org/10.33545/pathol.2020.v3.i1f.203

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 2018 and Dec 2019. A total of 4280 cases of conventional Pap smears were included in the study. Clinical data and history of the patients were retrieved. All cases were reported according to Bethesda system.
Results: Among 4280 cases, 256 Pap smears were unsatisfactory, 3762 Pap smears were negative for intraepithelial lesion/malignancy (NILM), and 262 cases had ECA.
Conclusion: Large hospital-based studies are required for proper implementation of health services as well as sensitive screening test for early detection of cervical abnormalities which can be helpful in decreasing the burden of cervical cancer in our community.

Keywords: cervical cancer; epithelial cell abnormalities (ECA); negative for intraepithelial lesion (NILM); pap smear

1. Introduction

1.1 Cervical cancer is the second most common cancer in India in women accounting for 22.86% of all cancer cases in women with 96,922 new cases and 60,078 deaths in 2018 [1, 2]. In developing countries females generally visit to gynecology department with the symptoms such as pain abdomen, discharge per vaginum, or menstrual abnormalities [3]. Rarely, they come for routine screening for the detection of cervical abnormalities.

2.2. Screening of cervical cancer is effective, feasible and affordable way for early detection and management. Five screening methods are available: Naked eye visual inspection of the cervix with application of diluted acetic acid (VIA), examination with Lugol's Iodine (VILI) or with a magnifying device (VIAM), Pap smear and Human Papilloma Virus (HPV) testing with high-risk probe of the Hybrid Capture-2 assay (HC2). These methods are used to detect the cervical cancer in precancerous stage [4]. Cervical Pap smear is a sensitive, painless, cost effective, and outdoor patient department (OPD) procedure. The US Preventive Services Task Force and the American Cancer Society now recommends cytological screening every 3 years starting from age 21 but not lower. Repeated Pap smear screening is recommended as cervix desquamates irregularly and hence repeated testing over time increases the chances of detecting a missed abnormality in a previous testing [5]. Implementation of revised Bethesda System has unified various overlapping terminologies and created a standardized framework for laboratory reports that includes a descriptive diagnosis and an evaluation of specimen adequacy [6].

The present study aims to evaluate the spectrum and prevalence of epithelial cell abnormalities (ECAs) using revised Bathesda system in females attending a tertiary care hospital.

2. Materials and methods

This is a retrospective study done from July 2018 to Dec 2019 in a tertiary care hospital.

All cases received in the department of pathology from the routine screening, incidental screening, as well as camp screening were considered initially in this study.

However inclusion criteria include

1. Women of age >21years.
2. Women with vaginal discharge, post coital bleeding, intermenstrual bleeding, post-menopausal bleeding, unhealthy cervix, lesion that bleeds on touch.
3. Women without any symptoms.

Exclusion criteria were

1. Known case of cancer cervix.
2. Treated cases of cancer cervix.
3. Pregnant women.

A total of 4280 cases of conventional Pap smears were reviewed and reported by experienced pathologists. Conventional smear was stained by automated linear Pap Stainer. Cytological evaluation of the Pap smears was reported according to the Bethesda classification system as follows [7].

1. Adequacy of sample

- Satisfactory
- Unsatisfactory

2. Squamous cell abnormalities

- Atypical squamous cells (ASC)
- ASC of undetermined significance (ASC-US)
- ASC, cannot rule out high grade lesion (ASC-H)
- Low-grade squamous intraepithelial lesion (LSIL)
- High grade squamous intraepithelial lesion (HSIL)
- Squamous cell carcinoma (SCC)

3. Glandular cell abnormalities

- Atypical glandular cells, specify site of origin, if possible
- Atypical glandular cells, favour neoplasia (AGC-FN)
- Adenocarcinoma (ADC)

4. Other cancers (e.g., lymphoma, metastasis, sarcoma)

Permission was granted by the ethical committee to conduct the study.

3. Results

3.1 A total number of 4280 samples were retrospectively analyzed. The age of the patients with an abnormal Pap smear was between 32 and 70 years. The most common age of presentation was the fourth decade (Table 1).

Table 1: Socio-demographic characteristics of the women

Socio-demographic Characteristics		Number	Percentage
Age group	21-30 years	620	14.5
	31-40 years	1456	34
	41-50 years	1242	29
	51-60 years	556	13
	61-70 years	406	9.5
Parity distribution	Nulliparous	107	2.5
	Primiparous	492	11.5
	Multiparous	3681	86
Marital status	Unmarried	0	0
	Married	4280	100
Contraception usage	None	1498	35
	Barrier	1456	34
	OCP	171	4
	Tubal ligation	856	20
	IUCD	214	5
	Others	85	2

3.2 The presenting complains were vaginal discharge, inter-menstrual bleed, post-coital bleed, post-menopausal bleed and unhealthy cervix. Vaginal discharge was the most common complaint, present in 58% of cases (Table 2).

Table 2: Chief complaints

Chief complaints	Number	Percentage
Vaginal discharge	2482	58
Inter-menstrual bleed	899	21
Post-coital bleed	342	8
Post-menopausal bleed	364	8.5
Unhealthy cervix	193	4.5
Total	4280	100

3.4 On per speculum examination, 28% of cases had healthy cervix, 25% had vaginal discharge, 14% cervical erosion, 11% bleeding on touch, 9% chronic cervicitis, 6% fibroid uterus, 4% cervical polyp and 3% ectropion of cervix (Fig 1).

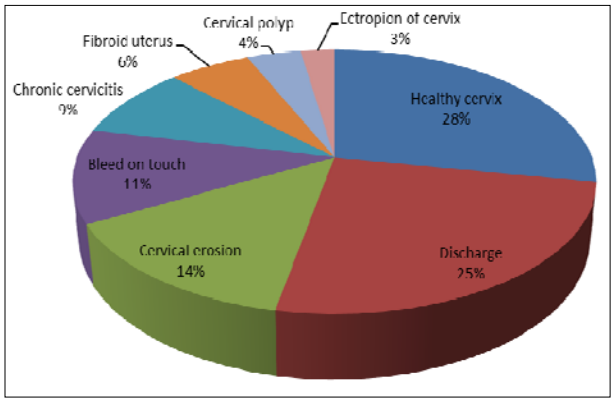

Fig 1: Clinical findings

3.5 Out of 4280 Pap smears, 256 (5.9%) smears were unsatisfactory for evaluation, 3762 (87.9%) smears were negative for intraepithelial lesion/malignancy (NILM).

Abnormalities were noted in 262 cases, of which 96 (2.2%) smears were reported as atypical squamous cells of undetermined significance (ASCUS) (Fig 2), 21 (0.5%) smears atypical squamous cells- cannot exclude high grade lesion (ASC-H) (Fig 3), 45 (1.05%) smears low grade squamous intraepithelial lesion (LSIL), 32 (0.8%) smears high grade squamous intraepithelial lesion (HSIL) (Fig 4), 28 (0.65%) smears squamous cell carcinoma (SCC) (Fig 5), 21 (0.5%) smears atypical glandular cells- not otherwise specified (AGC-NOS), 14 (0.3%) smears atypical glandular cells- favouring neoplasia (AGC-FN) (Fig 6) and 5 (0.1%) smears were reported as adenocarcinoma (Fig 7) (Table 3).

Table 3: Evaluation of Pap smears

Cytology	Number	Percentage
Unsatisfactory	256	5.9
NILM	3762	87.9
ASCUS	96	2.2
ASC-H-	21	0.5
LSIL	45	1.05
HSIL	32	0.8
SCC	28	0.6
AGC-NOS	21	0.5
AGC-FN	14	0.3
ADENO CA	5	0.1
Total	4280	100

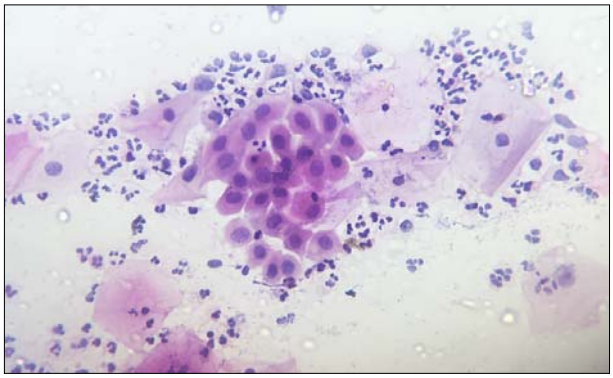

Fig 2: Papanicolaou stain, × 400, showing atypical squamous cells with undetermined significance (ASCUS).

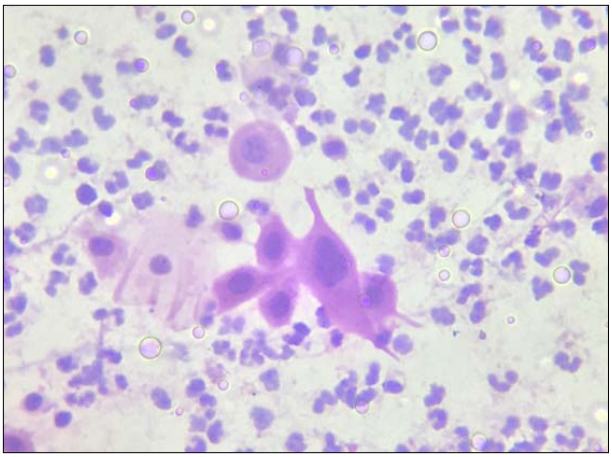

Fig 3: Papanicolaou stain, × 400, showing atypical squamous cells-cannot exclude high grade squamous intraepithelial lesion (ASC-H).

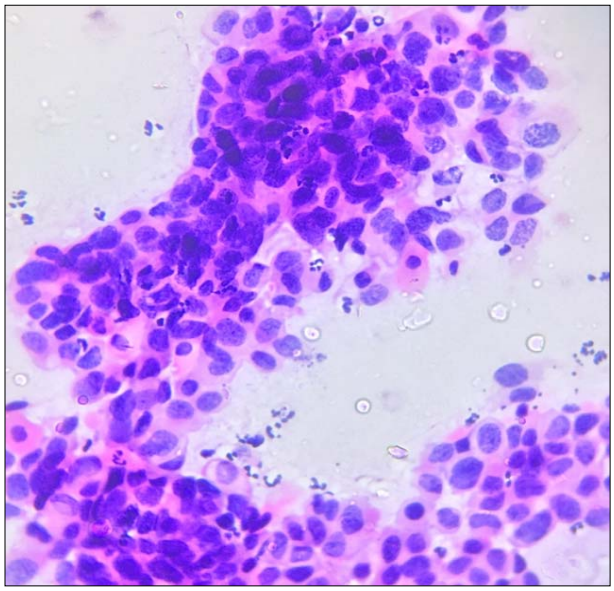

Fig 4: Papanicolaou stain, × 400, showing high grade squamous intraepithelial lesion with atypical parabasal cells.

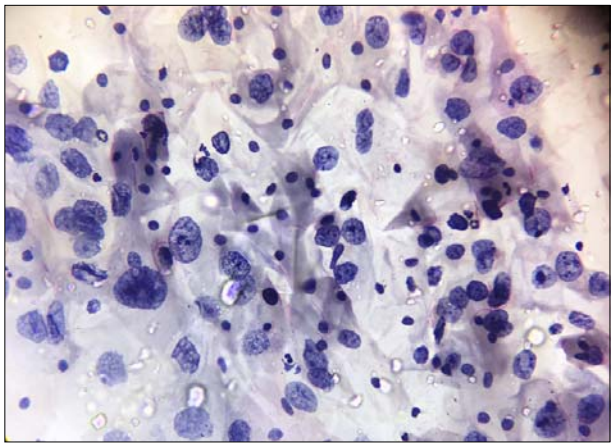

Fig 5: Papanicolaou stain, × 400, showing squamous cell carcinoma (SCC) with singly scattered atypical squamous cells with coarse chromatin and prominent nucleoli.

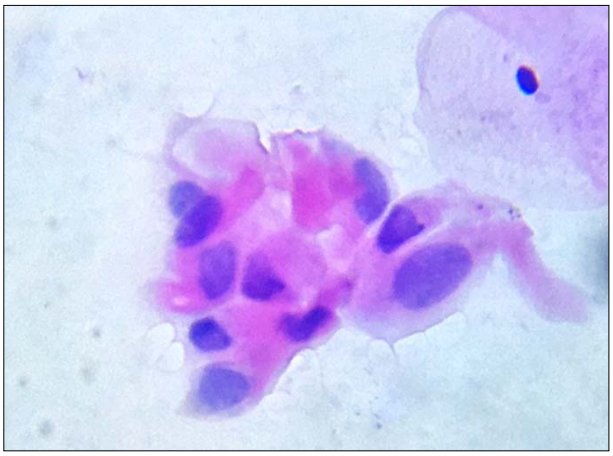

Fig 6: Papanicolaou stain, × 400, showing atypical endocervical cells favouring neoplasia (AGC-FN)

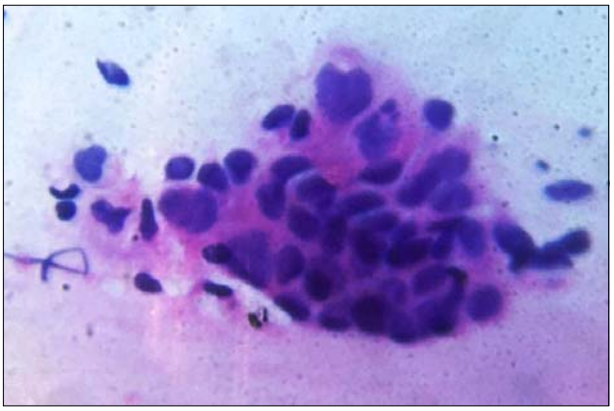

Fig 7: Papanicolaou stain, × 400, showing adenocarcinoma not otherwise specified with atypical endocervical cells.

Of the 3762 NILM Pap smears, the most common finding was non-specific inflammation which was present in 1308 Pap smears. Among these 1308 inflammatory Pap smears, 72 were associated with infection with the most common infection being bacterial vaginosis in 47 followed by candidiasis in 15 cases. Four cases each of trichomonas vaginalis, three cases of each of herpes simplex virus infection, and microfilariasis.

4. Discussion

4.1 With the changes in the life styles and demographic profiles, non-communicable diseases are emerging as an important health problem which demand appropriate control program before they assume epidemic propagation. According to National Cancer Registry Program of India, cancers of uterine cervix and breast are the leading malignancies seen in females. Screening program should be effective and aimed at specific age group for detecting precancerous condition before they progress to invasive cancers [8].

4.2 Cervical carcinoma is more common in the low resource developing countries constituting 70% of the global burden. Approximately one fifth of all new cases are reported in India. It is the fourth most common cause of cancer death (266,000 deaths in 2012) in women worldwide. In sub-Saharan Africa, 34.8 new cases of cervical cancer are diagnosed per 100,000 women annually and 22.5 per 100,000 women die from the disease. These figures were compared with 2.5-6.6 per 100,000 women in North America. The drastic differences can be explained by lack of access to effective screening and to services that facilitate early detection and treatment [9]. The current estimates indicate approximately 96,922 new cases diagnosed and 60,078 deaths annually in India [1, 2]. However all the urban population based cancer registries at Bangalore, Bhopal, Chennai, Delhi and Mumbai have shown a statistically significant decrease in the Age Standardized Incidence Rates (AARs) of this site of cancer [10].

4.3 Conventional cervical cytology is the most widely used cancer screening test in the world. It has been associated with impressive reductions in cervical cancer burden in many developed countries [1]. However the screening in India is mainly opportunistic and the coverage is 2.6-4.9%. Even though the cancer registries show decline in cervical cancer incidence, it is mainly urban statistics. In rural areas cervical cancer still ranks number one in India [1, 11]. The WHO recommends that in developing countries, women aged between 18-69 years should be screened for cervical cancer every 3 years. In our study, the youngest age screened was 21 years and oldest age was 69 years. Unlike many other cancers, cervical cancer occurs early and strikes at the productive period of a woman's life. The incidence rises in 30–34 years of age and peaks at 45–55 years [1]. In our study, cervical cancer was noted between 39- 65 years.

4.4 This study included 4280 Pap smears, of which the most common epithelial abnormality was ASCUS and the least common was adenocarcinoma. The rate of unsatisfactory smear was slightly higher (5.9%) in the present study as compared to the other studies done by Crasta *et al.* (1.36%), Nair *et al.* (2.7%) and Sankaranarayanan *et al.* (4.1%) but lower than Patel *et al.* (11.9%) and Kalyani *et al.* (17.8%) (Table 4) [3, 4, 6, 12, 13]. The unsatisfactory rate is an important quality assurance indicator in cervical cytology as it identifies women who are being inadequately screened. High rate of unsatisfactory smears could be due to low cellularity and obscuration of the squamous cells by dense inflammation or blood.

Table 4: Percentage of unsatisfactory smears in present study compared with other studies.

Study	Percentage of unsatisfactory smears
Crasta *et al.* [12]	1.36%
Nair *et al.* [6]	2.7%
Shankarnarayanan *et al.* [13]	4.1%
Present study	**5.9%**
Patel *et al.* [3]	11.9%
Kalyani *et al.* [4]	17.8%

4.5 In studies conducted in India, Misra *et al.* (2369 females) and Nene *et al.* (79,449 females) reported the highest and lowest rate of ECA in 26.8% and 1.17% of cases, respectively [14, 15]. The present study had ECA in 6.1% of cases which is approximated to the studies conducted by Patel *et al.*, (5.5%, 995 females) and Misra *et al.* (7.7%, 36484 females) [3, 16]. Low literacy rate and lack of medical facilities in rural area are the main reasons for high rates of cervical cancer in rural Indian females. Considering all lesions together, the most frequent epithelial abnormality in our study was ASCUS (2.2%). This may be attributed to the more number of camps organized and the awareness programmes conducted by the hospital staff in the nearby and far rural areas. Highest prevalence rate of ASCUS was also seen in studies done by the Patel *et al.* (4.12%), Kalyani *et al.* (1.46%) and Kumari *et al.* (0.6%) [3, 4, 17]. Whereas most of the other studies indicate LSIL as the most frequent epithelial abnormality. This may be explained by the fact that patients in those areas did not visit the tertiary health institute for cancer screening purpose, but rather with specific gynecological complaints emphasizing the need for more awareness programmes in such areas.

4.6 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 the camp-based study done by Nene *et al.*, the acceptance rate of young female to Pap smear was more than older females [15]. This may be due to fear of diagnosis of a high-grade disease, lack of education, and awareness in older females.

4.7 The comparison of the present study with other hospital-

based studies is done in the tabulated manner (Table 5) [3, 4, 6, 12, 13, 16, 17, 18]. The present study also had glandular cell abnormalities in 40 (0.9%) of cases which was not mentioned in most of the other studies. ASC-H was also underreported in other studies. The high prevalence of cytological abnormalities seen in Indian studies might be due to difference in place of study, reporting pattern, sample size, age, literacy, related infections, availability and awareness of screening program, as well as social and cultural differences.

Table 5: Comparison of ECA of the present study with other hospital based studies.

Studies	No. of cases	ASCUS%	ASC-H%	LSIL%	HSIL%	SCC%	AGC%	ADC%
Present	4280	2.2	0.5	1.05	0.8	0.6	0.8	0.1
Patel *et al.* [3]	995	4.1	-	0.1	0.1	0.7	0.5	-
Kalyani *et al.* [4]	1234	1.46	0.32	0.24	0.41	0.41	0.24	-
Nair *et al.* [6]	2028	0.15	-	1.58	0.49	0.20	-	-
Crasta *et al.* [12]	10787	0.38	-	0.19	0.62	0.18	0.35	0.15
Shankarnaryanan *et al.* [13]	22663	2.6	-	4.4	1.5	0.2	-	-
Misra *et al.* [16]	36484	-	-	5.5	1.6	0.6	-	-
Kumari *et al.* [17]	15270	0.6	0.16	0.37	0.21	0.25	0.4	0.05
Sachan *et al.* [18]	1650	2.9	-	5.1	0.5	0	-	-

4.8 A decrease in age-adjusted rate (AAR) of cervical cancer in India is shown by population-based studies. The 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 [19].

4.9 A hospital-based data is essential to estimate the prevalence of cervical premalignant and malignant cases and to detect the efficacy of ongoing screening test. If high risk cases are screened once in their lifetime, a large number of SIL and carcinoma cervix cases could be detected early, the treatment of which would save many precious lives. A broad coverage approach would be better goal-oriented to obtain the maximum benefit from a limited cytological surveillance program However, the limitation of the study was that these cases were not histopathologically correlated and thus, sensitivity and specificity could not be evaluated. Use of liquid based cytology methods may further reduce the number of unsatisfactory smears, but is not cost effective in our set up. 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.

5. Conclusion

Pap smear testing is a very useful, simple, economical, and safe tool for detecting precancerous cervical epithelial lesions. It should be established as a routine screening procedure to reduce the treatment burden, morbidity, and mortality. Every woman above the age of 30 years should undergo routine cervical cancer screening, even into the postmenopausal period as many patients with epithelial cell abnormalities in our study also fall in this category. 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.

6. References

1. WHO/ICO Information Centre on HPV and Cervical Cancer (HPV Information Centre). Summary report on HPV and cervical cancer statistics in India, 2019.
2. Available from: http: //www.cancerindia.org. in/globocan- 2018-india-factsheet.
3. Patel MM, Pandya AN, Modi J. Cervical Pap smear study and its utility in cancer screening, to specify the strategy for cervical cancer control. Natl J Community Med. 2011; 2:49-51.
4. Kalyani R, Sharief N, Shariff S. A Study of Pap Smear in a Tertiary Hospital in South India. J Cancer Biol Res. 2016; 4(3):1084.
5. Akinfolarin AC, Olusegun AK, Omoladun O, Omoniyi-Esan GO, Onwundiegu U. Age and pattern of Pap smear abnormalities: Implications for cervical cancer control in a developing country. J Cytol. 2017; 34:208-11.
6. Nair GG, Shamsuddin F, Narayanan T, Balan P. Cytopathological pattern of cervical pap smears – a study among population of North Malabar in Kerala. Indian Journal of Pathology and Oncology, Oct-Dec. 2016; 3(4):552-557.
7. Solomon D, Davey D, Kurman R, Moriarty A, O'Connor D, Prey M *et al.* The Bethesda system: Terminology for reporting results of cervical cytology. JAMA. 2002; 287:2114-9.
8. Rejendra A Kerkar, Yogesh Kulkarini. Screening for cervical cancer: an overview. Obstet Gynecol India. 2006; 56(2):115-122.
9. Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M *et al.* Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN, 2012. Int J Cancer. 2015; 136:359-386.
10. Nandakumar A, Ramnath T, Chaturvedi M. The magnitude of cancer cervix in India. Indian J Med Res. 2009; 130:219-221.
11. Aswathy S, Quereshi MA, Kurian B, Leelamoni K. Cervical cancer screening: Current knowledge & practice among women in a rural population of Kerala, India. Indian J Med Res. 2012; 136:205-210.
12. Crasta JA, Chaitra V, Simi C, Correa M. An audit of cervicovaginal cytology in a teaching hospital: Are atypical glandular cells under-recognised on cytological screening? J Cytol. 2009; 26:69-73.
13. Sankaranarayanan R, Thara S, Sharma A, Roy C, Shastri S, Mahé C *et al.* Accuracy of conventional cytology: results from a multicentre screening study in India. J Med Screen. 2004; 11:77-84.
14. Misra JS, Srivastava AN, Gupta HP. Impact of literacy

status on the cervical cancer screening in rural women of India. Invest Gynecol Res Womens Health. 2017; 1:510.
15. Nene B, Jayant K, Arrossi S, Shastri S, Budukh A, Hingmire S *et al.* Determinants of women's participation in cervical cancer screening trial, Maharashtra, India. Bull World Health Organ. 2007; 85:264-72.
16. Misra JS, Srivastava S, Singh U, Srivastava AN. Risk-factors and strategies for control of carcinoma cervix in India: hospital based cytological screening experience of 35 years. Indian J Cancer. 2009; 46(2):155-59.
17. Kumari M, Kolte S. Experience of cervical Pap smear screening in tertiary care hospital. Int J Med Sci Public Health, 2020, 9, (Online first).
18. Sachan PL, Singh M, Patel ML, Sachan R. A study on cervical cancer screening using pap smear test and clinical correlation. Asia Pac J Oncol Nurs. 2018; 5:337-41.
19. Sreedevi A, Javed R, Dinesh A. Epidemiology of cervical cancer with special focus on India. Int J Womens Health. 2015; 7:405-14.