Original Article

Indian Journal of Forensic Medicine and Pathology
Volume 13 Number 1, January - March 2020
DOI: http://dx.doi.org/10.21088/ijfmp.0974.3383.13120.12

Pattern of Cervical Cytology using Papanicolaou Stain: An Experience from a Tertiary Hospital

Rashmi Shetty[1], Ankitha Hebbar[2], Nagarekha Kulkarni[3], C Bharath[4], Pavithra P[5]

How to cite this article:

Rashmi Shetty, Ankitha Hebbar, Nagarekha Kulkarni et al. Pattern of Cervical Cytology using Papanicolaou Stain: An Experience from a Tertiary Hospital. Indian J. Forensic Med Pathol. 2020;13(1):83–88.

Abstract

Introduction: Cervical cancer screening using Pap smear is the cornerstone of any cancer control program. The study aimed to know the burden of various cervical lesions which were assessed by conventional Pap smear study. *Methodology:* We included 500 referred symptomatic patients in the study. The history, deatiled clinical examination, per speculum examination and a vaginal examination were performed for all women. Pap smear was used to screen all women for cervical cancer. *Results:* Mean age of the study population was 44 years and the most common complaint was whitish discharge per vaginam (54%). Classifying patients according to the Bethesda System 2001 Guidelines, we observed 61% (n = 303) cases to be Negative for Intraepithelial Lesion or Malignancy (NILM), 36% (n = 182) as Atypical Squamous Cells (ASC), 2% (n = 10) as Atypical Endocervical Cells (AEC) and 1% (n = 05) as unsatisfactory. Of the 303 cases of NILM, non-specific inflammatory changes were seen in 63%, reactive cellular changes in 21%, atrophic changes in 10%, candidiasis in 3%, Gardnerella vaginalis in 2% and inflammation with Trichomonas in 1%. Of the 182 ASC, 30% had low-grade squamous intrapeithelial lesion, 26% atypical squamous cells of underdetermined significance, 24% with high-grade squamous intraepithelial lesion and 21% with squamous cell carcinoma. Of the 10 AEC cases, 1 case had adenocarcinoma. *Conclusions:* Pap smear is less invasive, cost-effective and simple procedure which can be used to detect dysplasia in the cervix.

Keywords: Cervical malignancy; HSIL; LSIL; Pap smear.

Introduction

Cervical cancer is a leading cause of cancer mortality in Indian women aged above 15. More than two-thirds of the Indian cases present at later stages. Around one-fifth of women who develop cervical cancer die within the first year of diagnosis and the 5-year survival rate is 50%.[1] In high-income countries, early detection of precancerous lesions by regular screening programs has resulted in prompt diagnosis and early treatment, before they progress to invasive cancer. This has led to a reduction in incidence of cervical cancer and decreased the mortality due to the same.[2] The international standard of screening is the Pap smear, an examination of cells on the surface of the cervix for precancerous lesions. Another investigation which involves detecting the DNA of the human papillomavirus (HPV) costs substantially more than the Pap smear. Unfortunately, cervical cancer affects women of lower socioeconomic status more commonly and therefore they are more likely to develop invasive cancer.[3] Since 2001, the inclusion of Pap smear in the government's cancer control program has been recommended as it is cheap and

Authors Affiliation: [1,2]Assistant Professor, [5]Associate Professor, Department of Pathology, Melaka Manipal Medical College, MAHE, Karnataka 576104, India. [3]Professor, [4]Professor and Head, Department of Pathology, Vijayanagar Institute of Medical Sciences, Ballari, Karnataka 583104, India.

Corresponding Author: Ankitha Hebbar, Assistant Professor, Department of Pathology, Melaka Manipal Medical College, MAHE, Karnataka 576104, India.

E-mail: ankitha.hebbar@gmail.com

Received on 08.09.2019, **Accepted on** 02.11.2019

© Red Flower Publication Pvt. Ltd.

easily available. In 2006, the Indian government and WHO developed guidelines to advocate the use of the Pap smear at district level, along with cheaper, simpler screening methods like visual inspection with acetic acid/Lugol's iodine at the primary health center level. The aim of the study is to know the burden of various cervical lesions by conventional Pap smear study.

Materials and Methods

Study design and sampling

The present cross-sectional study was conducted in the Department of Pathology, Vijayanagar Institute of Medical Sciences, Bellary in which referred patients from the outpatients clinic of the Department of Obstetrics and Gynecology were included. Women with symptoms like vaginal discharge, postcoital bleeding, postmenopausal bleeding, intermenstrual bleeding and persistent leucorrhea not responding to antibiotics, with normal looking but symptomatic cervix; and women with cervical lesions like polyps, erosion, hypertrophied cervix, cervix with nabothian cyst or with clinical evidence of acute pelvic infection were included in the study. Women who were bleeding at the time of examination, pregnant women and the ones with a history of hysterectomy/any cervical surgeries/radiotherapy/chemotherapy were excluded from the study. During the study period of 18 months, 500 cases were enrolled in the study. The study was approved by the Institutional Ethics Committee. Eligible patients were approached, the purpose of the study was explained to them and an informed written consent was taken before being included in the study.

Pap smear

Included patients were subjected to per vaginam and per speculum examination. Pap smears were collected using an extended-tip/Ayer's spatula to sample the transformation zone and adjacent squamous epithelium and an endocervical brush device was used to sample the endocervix. The scrapings were evenly spread onto the glassslide, and immediately fixed by dipping the slide in the jar containing equal parts of 95% alcohol and ether. The smear was stained with Papanicolaou stain and cytological interpretation was done by senior Pathology consultants. Reporting of the slide was done according to Bethesda classification[4] which is as follows: NILM (Negative for intraepithelial lesions or malignancy), ASCUS (Atypical squamous cells of undetermined significance), LSIL (Low-grade squamous intraepithelial lesions) and HSIL (High grade squamous intraepithelial lesions). Satisfactory cervical cytology was defined by the number of squamous cells in the sample. Criteria for "satisfactory for evaluation" included smears having at least 8000 to 12,000 well-visualized squamous cells and labelled specimen.

Data Collection and Data Analysis

Data were collected on a pre-designed semi-structured questionnaire. The data were compiled and described with the help of percentages.

Results

The age group of the patients ranged from 20 to 65 years with the mean age of 44 years (Table 1). Majority of the patients were in the age group of 40 to 49 years (31%) followed by 30 to 39 years (30.4%). The most common symptom at presentation was whitish discharge per vaginum (54%). Classifying patients according to the Bethesda System 2001 Guidelines, we observed 61% (n = 303) cases to be negative for intraepithelial lesion or malignancy (NILM), 36% (n = 182) as atypical squamous cells (ASC), 2% (n = 10) as atypical endocervical cells (AEC) and 1% (n = 05) as unsatisfactory. Figure 1 describes the distribution of patients interpreted as NILM. Of the 303 cases of NILM, 106 cases were in the age group between 40 and 49 years and the commonest mode of presentation was whitish discharge per vaginam (n = 184). Non-specific inflammation was the commonest subtype. Reactive cellular changes associated with inflammation was seen in 65 cases (21.45%). Mild nuclear enlargement, binucleation/multinucleation showing prominent nucleoli with cytoplasmic vacuoles and polychromasia with surrounding severe inflammation were considered reactive cellular changes with inflammation. Atrophic smear was interpreted in 10% of the cases. Atrophic smears were considered when predominantly small, round or oval parabasal cells which were scattered singly or in large sheets with scant basophilic or cyanophilic cytoplasm, increased N:C ratio, centrally located round to oval nuclei with were seen in a background of degenerated cellular debris and chronic inflammatory cells.

Atypical squamous cells were interpreted in 182 cases in cytology (Fig. 2). Among them, 47 cases were diagnosed as ASCUS. ASCUS was described when cells showed atypia in the form of nuclear

enlargement (2.5–3 times the normal cell size), mild increase in N:C ratio and mild hyperchromasia with nuclear membrane abnormality. There were 54 cases interpreted as LSIL. Pap smear in these patients showed superficial or intermediate atypical squamous cells with nuclear enlargement (>3 times the normal superficial or intermediate cell), nuclear pleomorphism, hyperchromatism and binucleation/multinucleation. Some of the cells showed koilocytic change with perinuclear halo and peripheral dense rim of cytoplasm in an inflammatory background. HSIL was interpreted in 43 cases, in which the Pap smear in these patients showed small, less mature, basal or para basal atypical squamous cells present either singly or in small aggregates with scant cytoplasm,

Table 1: Baseline characteristics of the patients included in the study

Variables	n (%)
Age distribution (in years)	
20 to 29	61 (12%)
30 to 39	152 (30%)
40 to 49	156 (31%)
50 to 59	80 (16%)
≥ 60	51 (11%)
Presenting complaints	
Whitish discharge per vaginam	270 (54%)
Lower abdominal pain	50 (10%)
Irregular menstruation	50 (10%)
Postcoital pain	45 (09%)
Cervical growth	40 (08%)
Pruritus	30 (06%)
Burning micturition	20 (04%)
Cytological diagnosis based on Pap smear	
Negative for intraepithelial lesion or malignancy (NILM)	303 (61%)
Atypical squamous cells	182 (36%)
Atypical endocervical cells	10 (2%)
Unsatisfactory	05 (01%)
Others	00 (00)

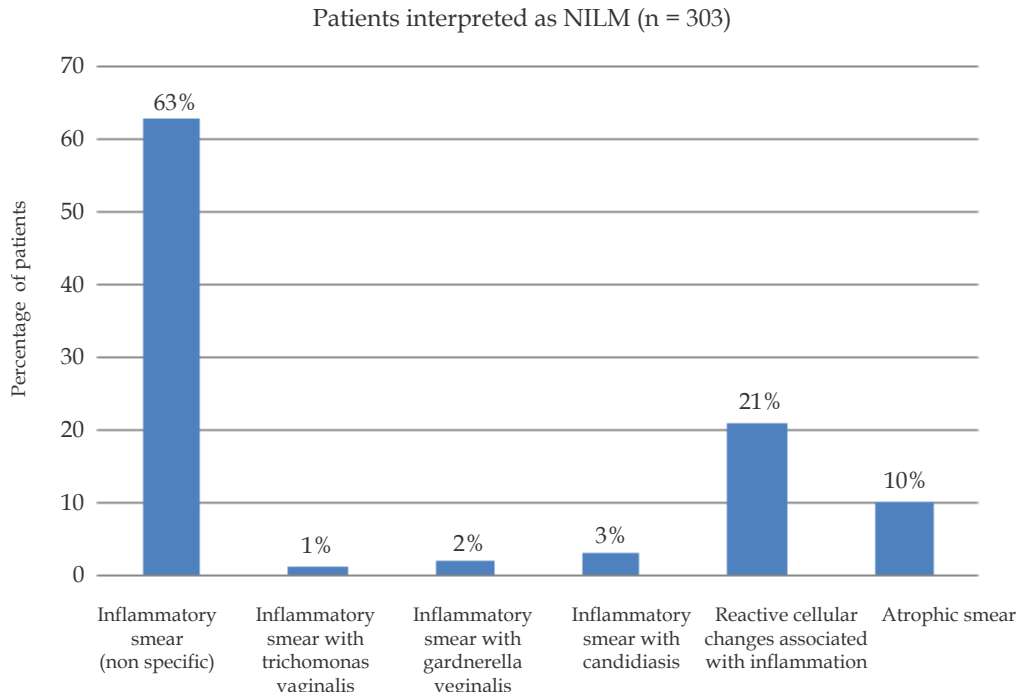

Fig. 1: Distribution of patients interpreted as negative for intraepithelial lesion or malignancy (NILM)

increased N:C ratio, hyperchromatism and nuclear membrane abnormality in an inflammatory background. SCC was interpreted in 38 cases, twenty-three of whom had chief presenting complaint of bleeding per vaginam. Pap smear showed cellular pleomorphism in the form of flat, round, polygonal, tadpole, spindle-shape cells in a background of nonspecific inflammatory cells. The nuclei were usually large and hyperchromatic with coarse chromatin. Mitotic figures were usually seen in the less well-differentiated cells.

Out of 10 cases which showed glandular cell abnormality (Fig. 3), 9 cases were reported as AEC, in which Pap smear showed sheets and strips of endocervical cells with scant cytoplasm, enlarged and hyperchromatic nuclei. One case was reported as adenocarcinoma, with the Pap smear showing sheets of columnar glandular cells with large, round, hyperchromatic nucleus, tumor diathesis, prominent nucleolus, abundant cytoplasm. Few cells showed gland formation and strips with pseudostratification.

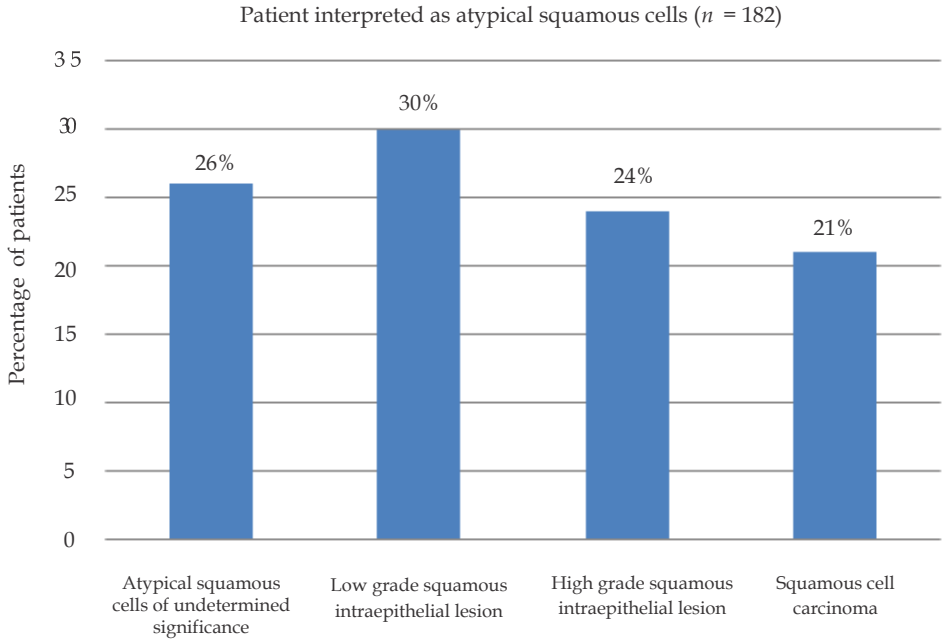

Fig. 2: Distribution of patients diagnosed with Atypical squamous cells

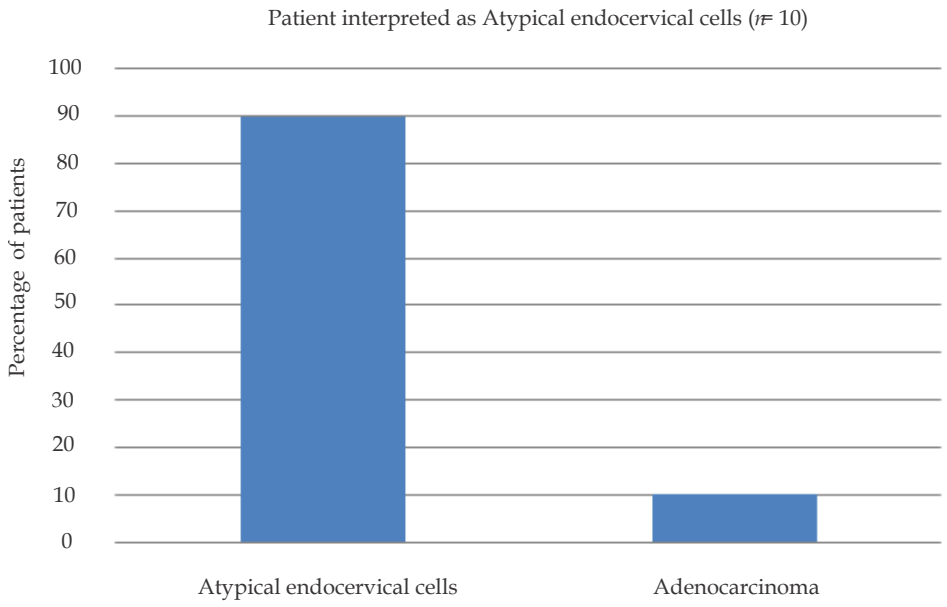

Fig. 3: Distribution of patients diagnosed with atypical endocervical cells

Discussion

In our study, mean age of the patients was 44 years. It is well established that unhealthy cervix is more common in women of reproductive age group, who are sexually active. Bamanikar et al.[5] and Kaveri et al.[6] in their study, also found the majority of their cases in the similar age group. Whitish discharge was the most common presenting complaint (54%). Lower abdominal pain, irregular menstruation and postcoital pain were present in approximately 10% of the patients. Similarly, Bamanikar et al.[5] and Kaveri et al.[6] reported that whitish discharge per vaginum was the most common symptom (23.95%) in their study, other common symptoms being pain in the lower abdomen, intermenstrual bleeding and dyspareunia. Verma and colleagues[7] in a similar study, found the commonest presenting complaint to be abnormal vaginal discharge which was 54.5% followed by inter menstrual bleed in 19.5%.

NILM was interpreted among 61% of our patients. Atla et al. found 69% of the Pap smears to be NILM (n = 248/356).[8] In 248 cases of NILM, nonspecific inflammation was seen in 100 cases, reactive cellular changes, squamous metaplasia and atrophy constituted the others. Sixty-four cases showed specific infections in smears. *Candida* species infection was most common, followed by *Trichomonas vaginalis*. Verma et al.[7] reported 56% NILM with 32.5% inflammatory smears. Similarly, Sharma et al. found 45.3% cases of inflammatory smears.[9]

We interpreted 36% of the smears as atypical squamous cells and 2% with atypical endocervical cells. Of these, LSIL were the most common, followed by ASCUS. LSIL cervical cytologic specimens occasionally contain a few cells that are suspicious for, but not diagnostic of, a high-grade squamous intraepithelial lesion. Retrospective studies have found that these women have a significantly higher likelihood of a high-grade lesion on biopsy than other women with LSIL (approximately 30 versus 15%).[10] Although this is not included in the Bethesda classification, some experts report such cytology as LSIL with a statement regarding the presence of a possible high-grade abnormality. These women should undergo colposcopy and endocervical sampling. Alta et al. found 27% to have epithelial abnormalities, approximately half of which has ASCUS.[8] Bal et al. observed 3% cases of squamous intraepithelial abnormalities.[11] Nayir et al. observed 1.7%, 0.2%, 0.5% & 0.1% ASCUS, ASC-H, LSIL & HSIL respectively.[12] Sachan et al. detected in 8.48% with epithelial cell abnormalities.[13] Padmini et al. found 16% of their smears to have epithelial abnormalities, 8% with ASCUS, 5% LSIL, 3% HSIL and 1% SCC.[14] The high prevalence of epithelial abnormality observed in our study might be due to cultural differences, age of study participants, incidence of related infections and the variability of cervical screening programs in different parts of the country.

Conclusion

Pap smear is a less invasive, cost-effective and simple procedure which can be used to detect common problems of infection in the cervix. The present study was done to describe the distribution of cervical lesions in symptomatic women referred to our department. Of the 500 smears, 61% were negative for intraepithelial lesion or malignancy. As the epidemiology of cervical lesions vary with the geographical location, socioeconomic status and cultural practices, similar studies are needed from different parts of India.

References

1. Mittra I, Mishra GA, Singh S, et al. A cluster randomized, controlled trial of breast and cervix cancer screening in Mumbai, India: methodology and interim results after three rounds of screening. International Journal of Cancer 2010;126(4):976–84.
2. Sankaranarayanan R, Budukh AM, Rajkumar R. Effective screening programmes for cervical cancer in low- and middle-income developing countries. Bull World Health Organ 2001;79(10):954–62.
3. Krishnan S, Madsen E, Porterfield D, et al.Advancing cervical cancer prevention in India: implementation science priorities. Oncologist. 2013;18(12):1285–97.
4. Salhan S. Bethesda system of grading of cervical cancer. Text Book of Gynaecology. 1st ed., Jaypee Brothers Medical Publishers Private Ltd. New Delhi 2011.pp.311–2.
5. Bamanikar SA, Baravkar D, Chandanwale S, et al. Study of cervical cytology and its correlation with clinical and histopathological findings. Clinical Cancer Investigation Journal 2016 Sep 1;5(5):403.
6. Kaveri SB, Khandelwal S. Role of Pap smear and cervical biopsy in unhealthy cervix. Journal of Scientific and Innovative Research 2015;4(1):4–9.
7. Verma A, Verma S, Vashist S, et al. A study on cervical cancer screening in symptomatic women using Pap smear in a tertiary care hospital in rural area of Himachal Pradesh, India. Middle East Fertility Society Journal 2017 Mar 1;22(1):39–42.
8. Atla BL, Uma P, Shamili M,et al. Cytological patterns of cervical Pap smears with histopathological correlation. Int J Res Med Sci 2015;3(8):1911–6.

9. Sharma Sudha. Down staging of carcinoma cervix: A suitable of approach for low resource settings. J.NP. Med. Assoc 2000;39:195–98.
10. Alsharif M, Kjeldahl K, Curran C, et al. Clinical significance of the diagnosis of low-grade squamous intraepithelial lesion, cannot exclude high-grade squamous intraepithelial lesion. Cancer 2009;117:92.
11. Bal MS, Goyal R, Suri AK et al. Detection of abnormal cervical cytology in Papanicolaou smears, J Cytol 2012 Jan;29(1):45–7.
12. Nayir T, Okyay AR, Nizlican E, et al. Cervical cancer screening in an early diagnosis and screening centre in Mersin, Turkey. Asian Pac J Cancer Prev. 2015;16(16):6909–12.
13. Sachan PL, Singh M, Patel ML, et al. A study on cervical cancer screening using Pap smear test and clinical correlation. Asia Pac J Oncol Nurs. 2018 Jul-Sep;5(3):337–341.
14. Padmini CP, Indira N, Chaitra R, et al. Cytological and colposcopic evaluation of unhealthy cervix. J Evid Med Healthc 2015;2:6920–7.