Original Research Article

Cervical cytology by pap smear in reproductive population

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ABSTRACT

Background: The present hospital-based study was conducted to study the incidence of various cervical epithelial abnormalities such as infection, dysplasia and early cervical cancer changes in reproductive age population and its correlation with age, parity, socioeconomic status, clinical symptoms and cervical biopsy findings.

Methods: A prospective study was conducted in 300 women of reproductive age group. The cervical smear was taken from all patients by means of the scrape technique using the Ayre's spatula. Pap smear results were considered as positive (abnormal) when they are ASCUS, LSIL, HSIL or Invasive lesion. On persistence of unhealthy cervix/inflammatory smear after a course of antibiotic, direct cervical punch biopsy was taken.

Results: Inflammatory smears were seen in 88.0%, ASCUS in 5%, LSIL in 1.4%, HSIL in 0.3% and invasive carcinoma in 0.3% patients. Direct cervical punch biopsy was taken from 13 cases out of 264 with inflammatory smear. Most of these patients had cervicitis (12 cases) while 1 case showed CIN stage 2. All cases of ASCUS and LSIL had infection which showed chronic cervicitis on biopsy. HSIL and Invasive carcinoma showed CIN stage 2 and Carcinoma as their biopsy findings.

Conclusions: The Pap smear is a simple, safe, practical and cost-effective method for early detection of cervical cancer and its precursors. In developing countries like India, it is the most logical screening modality although it has a very low sensitivity, but detection rates could be further improved using liquid-based cytology and the use of endocervical cytobrush.

Keywords: Cervical biopsy, Cervical carcinoma, Cervical cytology, Pap smear

INTRODUCTION

Worldwide cervical cancer comprises approximately 12% of all cancers in women with an incidence of five lakh new cases reported each year of which almost one fourth of it occurs in India.[1] About 1,22,844 new cervical cancer cases are diagnosed annually in India and 67,477 cervical cancer deaths have been reported annually in India.[2] It is the second most common cancer in women worldwide but the commonest in developing countries like India. It accounts for 80% of deaths in developing countries like India.[3] Cervical screening is currently acknowledged as the most effective approach for cervical cancer control.

The dramatic reduction in the incidence of cervical cancer in developed countries is because of widespread use of an effective cytological screening test which can identify the premalignant and malignant lesions of the uterine cervix, which cannot be detected or even suspected by history and clinical examination.[4] Early detection of cervical abnormality at prompt time is the early need for the gynecologist, so as to prevent its progression to cervical intraepithelial neoplasia and invasive cancer thereafter. The factors like easy accessibility of cervix, propensity of cervical epithelial cells to exfoliate, rapid turnover of epithelial cells, evidence of wide spectrum of histological changes

ranging from mild atypia to frank malignancy and apparently prolonged natural history of disease help for early detection. Thus, they provide the best potential for control of progression of the epithelial abnormality to frank carcinoma by selective screening of population.

Epidemiological data indicates that incidence of cervical cancer will continue to be high due to poor hygiene, early marriage, multiparity, lack of screening facility. To control the disease, cytological screening should be undertaken routinely and intensively.[5] Various screening methods are available like cytology by Pap smear, visual inspection of cervix with acetic acid and/or Lugol's iodine, HPV- DNA Test, Liquid based cytology etc.

Pap smear is an effective method of cervical cancer screening. It is the laboratory method to examine the exfoliated or scraped cells to detect dysplasia. It is a simple routine outpatient procedure which is less expensive, with minimal or no side-effects, easy to do with higher specificity, done without anesthesia. It also detects various infection and inflammation with characteristic cytological appearances. Before 2012 cervical cancer screening guidelines of the American College of Obstetricians and Gynecologists (ACOG), American Cancer Society (ACS) and U.S. Preventive Services Task Force (USPSTF) differed on age to start and how often to get screened for cervical cancers.

In 2012, all the three-organization recommended that:[6]

- Screening by Papanicolaou test (pap) should not be used for women aged less than 21 years, regardless of initiation of sexual activity
- A screening interval of three years should be maintained by pap smear for women aged 21-30 years. HPV test is not recommended
- Women aged 30-65 years should have a pap test and a HPV test (co-testing) every 5 years or is even acceptable to have a Pap test alone every 3 years

The present hospital-based study was conducted to study the incidence of various cervical epithelial abnormalities such as infection, dysplasia and early cervical cancer changes in reproductive age population and its correlation with age, parity, socioeconomic status, clinical symptoms and cervical biopsy findings.

METHODS

A prospective study was conducted in women of reproductive age group attending Out Patient Department of Gynecology at Al-Ameen Medical College and Hospital, Vijayapura, Karnataka. Women more than 21 years of age presented with c/o white discharge per vagina, irregular menstrual cycle, post-coital bleeding, h/o multiple sexual partners and h/o sexually transmitted disease were included. Unmarried females, women <21 years, treated cases of carcinoma and hysterectomized

women were excluded. When a patient who fulfilled the criteria of the study, came to the Gynaecology OPD the procedure was explained to the patient in detail, clinical details were noted and entered into the proforma. The patient was put in dorsal position after emptying the bladder. Per speculum examination was done without using lubricants. Naked eye examination of the cervix was done to evaluate its colour, shape, size, presence of any lesions, discharge. The cervical smear was then taken by means of the scrape technique using the Ayre's spatula.

The longer end of the spatula was inserted into the external Os and rotated through 360° maintaining firm pressure so as to scrape the squamocolumnar epithelial junction throughout its circumference. Care was taken to include all abnormal looking areas. The spatula was then withdrawn without touching the vaginal walls to avoid contamination with cells from the lower genital tract. The smear was made by spreading the scraped material evenly, with a circular motion on a glass slide having the patients' identity labeled. It was then fixed in fixative solution, which contains 95% alcohol and ether for 15-30 minutes and then sent to the cytopathology laboratory. The smears were stained according to modification of Papanicolaou (1942).[7]

Pap smear results were considered as positive (abnormal) when they are ASCUS, LSIL, HSIL or Invasive lesion. The plan was to evaluate these women further by cervical punch biopsy where a portion of cervix was taken, and the tissue was then processed and viewed under microscope. All patients with inflammatory smear and unhealthy cervix were treated with a course of oral antibiotics (Doxycycline 100 mg BD, Metronidazole 400 mg BD) for a period of 2 weeks. On persistence of unhealthy cervix and inflammatory smear on Pap smear-direct cervical punch biopsy was taken.

Statistical analysis

For continuous variables, the summary statistics of mean, standard deviation (SD) were used. For categorical data, the number and percentage were used in the data summaries. Chi-square (χ^2)/Freeman-Halton Fisher exact test was employed to determine the significance of differences between groups for categorical data. If the p-value was <0.05, then the results were considered to be statistically significant. Data were analyzed using SPSS software v.23.0.

RESULTS

Normal smears were seen in 5.0% patients, Inflammatory smears in 88.0%, ASCUS in 5%, LSIL in 1.4%, HSIL in 0.3% and Invasive Carcinoma in 0.3% patients (Table 1).

Majority of normal or inflammatory smears were seen in 35-39 years (33.7%). ASCUS and LSIL was mostly seen in 35-39 years (57.9%) whereas HSIL and malignancy

was found in only 40-45 years age group (p-0.984) (Table 2).

Table 1: Distribution of patients according to pap smear findings.

Type of smear	N	%
Normal	15	5.0
Inflammatory	264	88.0
ASCUS	15	5.0
LSIL	4	1.3
HSIL	1	0.3
Invasive Ca	1	0.3
Total	300	100.0

Table 2: Association of cervical smear findings with age.

Age (yrs)	Normal/ Inflammatory		ASCUS/ LSIL		HSIL/ Invasive Ca		Total
	N	%	N	%	N	%	N
21-24	21	7.5	0	0.0	0	0.0	21
25-29	41	14.7	0	0.0	0	0.0	41
30-34	45	16.1	2	10.5	0	0.0	47
35-39	94	33.7	11	57.9	0	0.0	105
40-45	78	28.0	6	31.6	2	100	86
Total	279	100	19	100	2	100	300

P-value: 0.984

Similarly, no association was observed between socio-economic status with cervical epithelial abnormalities (Table 3).

Table 3: Association of cervical smear findings with socio-economic status.

SES	Normal/ Inflammatory		ASCUS/ LSIL		HSIL/ Invasive Ca		Total
	N	%	N	%	N	%	N
Low	141	50.5	15	78.9	1	50.0	157
Middle	108	38.7	4	21.1	1	50.0	113
High	30	10.8	0	0.0	0	0.0	30
Total	279	100.0	19	100	2	100	300

P-value: 0.85

There is a significant association with parity and type of smear. ASCUS, LSIL, HSIL and malignancy were more common in females with parity >2 (p<0.05) (Table 4).

Majority of normal smears were predominant in asymptomatic women. White discharge per vagina was the main symptom in HSIL and invasive carcinoma. There is significant association in type of smear with clinical symptoms in our study (p<0.05) (Table 5). On persistence of unhealthy cervix and inflammatory smear even after a course of antibiotics- direct cervical punch biopsy was taken from 13 cases out of 264 with inflammatory smear. Most of these patients had cervicitis (12 cases) while 1 case showed CIN stage 2.

Table 4: Association of cervical smear findings with parity.

Parity	Normal/ Inflammatory		ASCUS/ LSIL		HSIL/ Invasive Ca		Total
	N	%	N	%	N	%	N
Nulli para	7	2.5	0	0.0	0	0.0	7
1 or 2	96	34.4	3	15.8	0	0.0	99
>2	176	63.1	16	84.2	2	100	194
Total	279	100	19	100	2	100	300

P-value: <0.05

Table 5: Association of cervical smear findings with clinical symptoms.

Clinical symptoms	Normal/ Inflammatory		ASCUS/ LSIL		HSIL/ Invasive Ca		Total
	N	%	N	%	N	%	N
WDPV	142	50.9	14	73.7	2	100	158
PV Bleeding	49	17.6	4	21.1	0	0.0	53
Pain abdomen	37	13.3	1	5.3	0	0.0	38
Asymptomatic	22	7.9	0	0.0	0	0.0	22
U-V descent	5	1.8	0	0.0	0	0.0	5
Others	24	8.6	0	0.0	0	0.0	24
Total	279	100	19	100	2	100	300

P-value: <0.05

Table 6: Association of cervical smear findings with cervical biopsy.

Type of smears	Biopsy findings					
	N	Cervicitis	CIN 1	CIN 2	CIN 3	Invasive carcinoma
Inflammatory	13	12	0	1	0	0
ASCUS	15	15	0	0	0	0
LSIL	4	4	0	0	0	0
HSIL	1	0	0	1	0	0
Invasive carcinoma	1	0	0	0	0	1

All cases of ASCUS and LSIL had infection which showed chronic cervicitis on biopsy. HSIL and Invasive carcinoma showed CIN stage 2 and Carcinoma as their biopsy finding (Table 6).

DISCUSSION

This is a prospective study, in which 300 women of reproductive age group who attended the Gynaecology Outpatient Department at Al Ameen Medical College and Hospital, Vijayapura, from November 2015 to August 2017 were studied to know the pattern of cervical cytology by Papanicolaou smear and its incidence and correlation with various parameters.

In present study, only 5% cases reported to have normal smears. Majority had inflammatory smears (88%) which also included bacterial vaginosis, trichomoniasis and candida albicans. ASCUS was seen in 5%, LSIL in 1.4%, HSIL in 0.3% and Invasive Carcinoma in 0.3% patients. The results of the present study were similar to that of Gupta S et al who found ASCUS in 3.6%, HSIL in 1% and Carcinoma in 0.41%.[8] Study conducted by Ghazal et al and Rao S et al also showed similar results.[9,10]

Keeping in mind the cut off of 21 years as the starting age of screening, we took women in the age group of 21-45 years.[6] The largest number of patients i.e. 35% belonged to the age group 35 to 39 years. This correlated well with the studies done by other authors.[11-15] Majority of normal smears were seen in 35-39 years (46.7%), 21-29 years predominantly had inflammatory smears. ASCUS and LSIL was mostly seen in 35-39 years with 53.3% and 75% respectively whereas HSIL and malignancy was found in only 40-45 years age group.

Study by Desai P et al showed similar results with mean age of 37.5 for LSIL and 41.6 years for HSIL.[15] Study conducted by Balaha et al mean age of 45 years for ASCUS, 35.8 years for HSIL.[16] While Gupta et al showed predominance of ASCUS, LSIL in less than 40 years and Carcinoma in >40 years age group.[8] Study by Saraiya U et al found mean age of 32.5 years, 37.5 years and 44.2 years for mild, moderate and squamous cell carcinoma.[17]

In present study, most of the patients belonged to low socioeconomic group contributing to 52.3% patients while high income group comprised of only 10% patients. It was because study population was mainly from rural areas surrounding Bijapur city. Similar observations were noted by Singh VK et al which showed 51.2% women and Sharma S et al who showed 60% women were of low socioeconomic group.[13,18]

In the present study, all cases of LSIL and Malignancy were found in low socio-economic status. HSIL was seen in women belonging to middle socioeconomic status. Results noted by Rathi S et al and Padmanabhan et al showed 92% of premalignant and malignant lesions in low socioeconomic group.[19,20]

In present study, most of the patients had parity >2, with 64.67% patients belonging to this group and only 2.3% were nulliparous. Sharma S et al studied sensitivity and specificity of cytology in 50 women and it showed that majority of patients had parity more than 3 (62%).[18] Other studies by Mukherji et al showed 35%, Singh VK showed 44.1% patients having 3-5 parity which is almost similar to the present study.[14,13] Present study showed that most abnormal Pap smear was noted in multipara with parity >2. Similar observations were made by Pankaj et al and Susheela et al where LSIL/ HSIL/ malignancy were seen in multiparous women.[15,19]

In present study, mmajority of patients presented with white discharge per vagina i.e. 52.6% which correlated well with study conducted by Sharma S et al who reported 52% patients with white discharge per vaginum.[18] Joshi et al conducted a study on correlation of pap smear for detection of premalignant lesions found 40% patients presenting with white discharge per vaginum.[21] Abnormal bleeding per vagina was seen in 17.7% which included menorrhagia, polymenorrhea, irregular cycles, oligomenorrhea, post coital bleeding. Abdominal pain was reported in 12.7%, Utero-vaginal prolapse in 1.7% and 9% patients reported with symptoms of urinary disturbances, backache, itching vulva, etc. whereas 7.3% were asymptomatic. Mukherjee et al reported abdominal pain in 19% patients and contact bleeding in 2%.[14] Present study showed majority of patients with abnormal smear presenting with white discharge per vaginum. ASCUS and LSIL mainly presented with white discharge (73.3% and 75% cases respectively) with irregular PV bleeding as the second most common presentation of abnormal Pap smear. White discharge per vagina was the presenting symptom in HSIL and invasive carcinoma (100%). Desai P et al found leucorrhea as the most common symptom in patients with squamous intraepithelial lesions and post coital bleeding in squamous cell carcinoma.[15] Chakravarthy et al found menstrual irregularities as common symptom in dysplasia.[11]

Most of patients with inflammatory smear who underwent cervical biopsy had cervicitis (92.3%) and 7.6% showed CIN 2, this stresses the importance of further screening inflammatory smear patients. All cases of ASCUS and LSIL had infection which showed chronic cervicitis in biopsy. HSIL and invasive carcinoma showed CIN 2 and carcninoma as their biopsy finding. Massad LS et al found 77% of ASCUS cases to be non-malignant.[22]

CONCLUSION

The Pap smear is the most simple, safe, practical and cost-effective method for early detection of cervical cancer and its precursors which if treated, eliminates or

reduces the subsequent development of invasive cancer. The Papanicolaou procedure is a screening test, not a diagnostic test, hence abnormalities of the smear should be confirmed histologically by biopsy. The false negative rate of Pap smear emphasizes that for its successful use it is essential that screening should be done yearly or every 2 years to reduce the chance of missing an early lesion. As the progression from pre-invasive to invasive carcinoma is slow, more frequent screening appears the gold standard for screening programs. In developing countries like India, cytology, a low cost and easily accessible test, is the most logical screening modality although it has a very low sensitivity, but detection rates could be further improved using liquid-based cytology and the use of endocervical cytobrush. Hence efforts must be directed towards education of women regarding cervical cancer in order to promote awareness of malignancy and to motivate them for cytological screening in the future.

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