CERVICAL PAP SMEAR PATTERN- COMPARISON OF HOSPITAL AND SCREENING CAMP POPULATION

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ABSTRACT

BACKGROUND

Cervical cancer is one of the leading causes of mortality and morbidity among women worldwide. In India it accounts for 25% of cancer deaths. Only limited number of studies are available on prevalence of cervical epithelial abnormalities, especially in Kerala. The objective of the study was to estimate the prevalence of cervical cytological pattern in central Kerala, so that appropriate screening strategies can be planned.

MATERIALS AND METHODS

A one-year descriptive study was conducted on cervical pap smears in study population groups: 1) camp population from various camps conducted in and around Kottayam and 2) hospital population and specimens received in the department of Pathology, Government Medical College, Kottayam during the study period of 12 months. Smears were assessed according to the revised Bethesda System 2014. A total of 240 cases of Pap smears were analysed in each group of population (hospital and screening camp).

RESULTS

The mean age of population in the present study was 48.20 ± 10.224 SD in camp and 48.23 ± 11.339 SD in hospital population. Majority belongs to the age group 41-50 years. In both, majority of the smears were negative for intraepithelial lesion or malignancy (NIL/M). Epithelial abnormality was seen in 1.25% cases (LSIL) of camp population & 2.5% cases (ASC-US, LSIL and HSIL 0.80% each) of hospital population.

CONCLUSION

Our study shows a relatively low prevalence of cervical epithelial abnormality similar to developed countries. Pap smear is an effective screening procedure to detect cervical cytological abnormalities. Routine screening should be offered to all women above 21 years. It is recommended to improve awareness about disease among females.

KEY WORDS

Cytopathological Pattern; Pap Smears; Epithelial Abnormality; Screening Camp.

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BACKGROUND

Cancer of uterine cervix is one of the leading cause of mortality and morbidity among women worldwide.¹ It is the fourth most frequently occurring cancer affecting women after breast, colorectal and lung cancers; it is also the seventh most common type of cancer overall. Cervical cancer is the most common cancer among women in 2 out of the 12 Population Based Cancer Registries (PBCRs) in India, and has the second highest incidence rate after breast cancer in the rest of the PBCRs.²

It is estimated that in India about 126,000 new cases of cervical cancer occur annually,³ and usually 70% or more of these cases present in stage III or Higher at the time of diagnosis. Cancer of cervix has a long latent period of about 10 years. Cervical cancer starts as a precancerous lesion, called dysplasia also termed as cervical intraepithelial neoplasia (CIN).

CIN starts at the transformation zone especially in relation to the squamous metaplasia and reserve cell hyperplasia. Cancer of cervix is readily preventable condition as it is easy to identify and treat its precursor lesions. The prognosis of cervical cancers worsens with the increasing stage of the disease. The early diagnosis and prompt specific treatment of pre-invasive or early stages of the disease reduces the prevalence of invasive carcinoma and improves the prognostic outcome of the patients. Unfortunately, most of the patients with early stages or pre-invasive carcinoma of cervix are asymptomatic and do not produce any specific clinical alterations of the cervix or may have only mild symptoms.

The screening for cervical cancer is based on the assumption that early detection may allow early treatment. It is a well-known fact that cytology based screening programs has resulted in dramatic reduction in the incidence and mortality of invasive cervical cancer in different countries of the world.⁴ Cervical cancers are more common in developing countries. The high burden of cervical cancer in developing countries is largely due to a lack of effective screening programs.

Papanicolaou (Pap) smear testing is an effective method of detecting, preventing and delaying the progress of cervical cancer. This is because the Pap smear test detects cervical epithelial cell abnormalities which represent a spectrum of intraepithelial lesions, from mild-to-severe dysplasia to invasive cancer and facilitates early diagnosis of the condition

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with adequate and repetitive cytological screening. Even though liquid-based cytology is popular in the developed countries, in low resource settings, a conventional Pap smear test is the main screening system still following. It is important to know the overall scenario of epithelial cell abnormality in the Pap smear, especially in a developing country like India which accounts for quarter of the cervical cancer deaths. By knowing the patterns of premalignant and malignant lesions in an area, we can set up screening strategies and counsel women about the need of cervical screening.

Reporting of pap smears using 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. Only limited number of studies are available on prevalence of various cervical epithelial abnormalities in various populations in India, especially in Kerala. Hence, we have undertaken the present study using the revised Bethesda System, with the intention to estimate the prevalence of cervical epithelial abnormalities.

MATERIALS AND METHODS

Type of Study

Cross sectional analytical study.

Study Period

One year (from August 1, 2017 to July 31, 2018)

Study Setting

Department of Pathology, Government Medical College, Kottayam.

Sample Size ⁵

$$n = \frac{\left(Z_{1-\alpha/2} + Z_{1-\beta} \right)^2 \left[p_1(1-p_1) + p_2(1-p_2) \right]}{(p_1 - p_2)^2}$$

Where $Z_{1-\alpha/2} = 1.96$, the standard normal variate value at 95% confidence interval ($\alpha=5\%$)

$Z_{1-\beta} = 0.842$, the standard normal variate value at 80%

power
P1= Proportion of epithelial abnormality in the institution = 0.01
P2 =Proportion of epithelial abnormality in the community= 0.05

Based on cervical smear records in our institution, P1 value is calculated. Since there was no previous data available for community P2 was calculated by assuming 5% prevalence. Estimated risk difference = -0.04
Power (1- beta) % = 80
Alpha error (%) = 5
1 or 2 sided = 2
Required sample size for each arm = 284
From the above, the sample size of each population was found to be 284,

However, sample size in each group will be limited by the size of camp population.

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Inclusion Criteria

First 284 cases of pap smears obtained from each group of females aged more than 21 years are included in this study.

Exclusion Criteria

Pap smears taken on post hysterectomy patients, already known cases of carcinoma cervix are excluded.

Study Procedure

All the specimens are collected by the scrapings from the Squamo-columnar junction by Ayre's spatula and are evenly spread onto a glass slide, and immediately fixed by dipping in Coplin jars containing equal parts of 95% ethyl alcohol and ether or any other cyto-fixatives. These specimens are received along with a requisition letter properly filled up with age, biopsy number. The specimens are then stained with Papanicolaou stain and analysed by the 2014 Bethesda system.

Data Management and Analysis

The data was entered in Microsoft excel and further statistical analysis was done using SPSS software (version 22).

Statistical Methods

1. Mean, frequency and proportion for:
 - a. Age.
 - b. Satisfactory and unsatisfactory smears.
 - c. Type of lesions.
 - d. Prevalence of epithelial abnormality.

Chi square test (p value).

RESULTS

Cervical smears were obtained from both screening camp and hospital population. Screening camps for cervical cancer were conducted at 7 centres nearby Kottayam. The centres were located at Brahnamangalam, Karukachal, Velloor, Neelimangalam, Karapuzha, Changanassery and Fathimapuram. The camps were organised by non-governmental associations, residential associations and National Health Mission. In some camps along with cervical cancer screening, medical camps were also conducted. In the camp patients were registered with basic details after which, a brief counselling was given regarding the benefits of cervical cancer screening. Cervical smears were made in the examination room provided using disposable Cusco's speculum and Ayre's spatula.

No. of Attendees for each Camp are given below-

• Brahnamangalam	55
• Karukachal	31
• Velloor	16
• Neelimangalam	21
• Karapuzha	62
• Changanassery	26
• Fathimapuram	29

Majority of the patients who attended the camps were asymptomatic and a few showed symptoms. The most frequent symptom was discharge per vaginum, and lower abdominal pain. A few cases showed cervical erosion and one case show cervical polyp, which caused some difficulty in taking smears.

The smears from hospital were obtained from the outpatient clinic of obstetrics and gynaecology department, medical college Kottayam.

A total of 240 cervical pap smears were analysed in each study group (Camp and Hospital Population).

189 cases of camp and 162 cases of hospital population were found to be satisfactory. 51 cases of camp and 78 cases of hospital population were found to be unsatisfactory for evaluation. The main causes for unsatisfactory smears were inadequate squamous component or obscuring inflammation.

The age group of the camp population ranges from 25 years to 75 years with the mean age of 48.20 ± 10.224 SD, majority belongs to the age group 41-50 years (40.83%). The age group of hospital population ranges from 21 years to 90 years with the mean age of 48.23 ± 11.339 SD, majority belongs to the age group 41-50 years (37.50%).

Majority of the smears were negative for intraepithelial lesion or malignancy (NIL/M) comprises 34.16% and 30.41%. (82 and 73 respectively) in each group. Nonspecific

inflammation was seen in 18.75% cases of both populations. 6.25% cases of camp population and 10.83% cases of hospital population had specific infection suggestive of candidiasis or bacterial vaginosis.

1.25% cases of camp population show epithelial abnormality, all are LSIL. 2.5% cases of hospital population showed epithelial abnormality, with ASC-US, LSIL and HSIL two cases each.

The p value of association between LSIL in hospital and camp population was found to be 0.653, which is statistically not significant. Since there was not even a single case of ASC-US, and HSIL were not detected in camp population, its association couldn't be checked.

Figure 4. Negative for Intraepithelial Lesion/Malignancy (NIL/M), 40X

Figure 5. Candidiasis, 100X

Figure 6. Bacterial Vaginosis, 40X

Figure 7. Non-Specific inflammation, 40X

Figure 9. Low-Grade Squamous Intra-Epithelial Lesion (LSIL), 40X

Figure 8. Atypical Squamous Cells of Undetermined Significance (ASC-US), 40X

Figure 10. High-Grade Squamous Intra-Epithelial Lesion (HSIL), 40 X

DISCUSSION

Cervical cancer incidence has decreased to more than half in last three decades with widespread use of screening with cervical cytology. Pap smear-based screening methods have played a pivotal role in reducing cervical cancer incidence and mortality. Cervical epithelial abnormalities vary from country to country and also from regions to region of a country. According to different studies conducted in different parts of the world, Saudi Arabia shows a prevalence of 14.52% whereas Nepal shows prevalence of 1.14%. There may be many factors which results in these variations including sample size, Selection criteria, Difference in population, Experience of the health professional collecting the PAP smears and attitude of the patients. The prevalence of epithelial abnormalities in different places of world and different regions of India is compared in Table 1 and 2.

No	Author	Year	Place	No of Patients	Total Prevalence (%)	Epithelial Abnormality (%)			
						ASC-US	LSIL	HSIL	SCC
1	Edelman et al ⁶	1995	New York	29, 295	13.2	9.9	2.5	0.6	0.2
2	Mufti et al ⁷	2000-2012	Saudi Arabia	15721	14.52	11.48	2.2	0.8	0.06
3	Banik et al ⁸	2010	Bangladesh	1699	8.18	0.18	6.36	1.18	0.35
4	Marahatta ⁹	2010-2012	Nepal	1751	1.14	0.45	0.85	0.28	-
5	Maryam et al ¹⁰	2007	Tehran	13315	1.18	0.63	0.21	0.13	0.2

Table 1. Comparison of Prevalence of Epithelial Abnormalities in Different Places of The World

The prevalence of epithelial abnormality with in India varies from 1.32 in Ahmedabad to 25% in Guwahati. North Malabar of Kerala shows a prevalence of 2.42% in a study conducted there In a study conducted in Kannur of Kerala the prevalence was 2.15%.

No.	Author	Year	Place	No. of Patients	Total Prevalence (%)	Epithelial abnormality (%)			
						ASC-US	LSIL	HSIL	SCC
1	Tiwari et al ¹¹	2007-2008	Delhi	100	22.5	17.5	2.5	2.5	-
2	Alakananda et al ¹²	2015-16	Guwahati	280	25	12.3	3	7	3
3	Kothari et al ¹³	1998-2010	Ahmedabad	36740	1.32	0.13	0.83	0.31	0.05
4	Patel et al ¹⁴	2014	Gujarat	1808	4.65	2.9	0.6	0.6	0.3
5	Misra et al ¹⁵	1971-2005	Lucknow	36484	7.8	-	5.5	1.6	0.6
6	Bamanikar ¹⁶	2011-2013	Pune	498	5.36	2.32	1.96	0.36	0.72
7	Nair ¹⁷	2012-2013	Malabar	2028	2.42	0.15	1.58	0.49	0.2
8	Thomas EE et al ¹⁸	2014-2015	Kannur	3059	2.15	0.26	1.01	0.88	-
9	Present study	2017-2018	Kottayam, Kerala	240(camp)	1.25	-	1.25	-	-
				240(hosp.)	2.5	0.80	0.80	0.80	-

Table 2. Comparison of Prevalence of Epithelial Abnormalities in Different Regions of India

The most common epithelial abnormality in camp population was LSIL (1.25%), and in hospital population ASC-US, LSIL and HSIL shows equal incidence (0.80% each). This is similar to studies conducted in S. Africa, Bangladesh, Nepal and in other places of India – Ahmedabad, Lucknow, Malabar and Kannur, where LSIL was the predominant abnormality. No case of invasive carcinoma was found in this study. This might be because women with higher grades of epithelial abnormality may present late and go directly for surgical intervention.

Limitations of The Study

The sample size of the study was small. As follow up of these patients could not be carried out, the final outcome was not known. No correlation of cervical abnormalities with clinical symptoms was done. Use of liquid-based cytology methods may further reduce the number of unsatisfactory smears, but is not cost effective in our set up.

CONCLUSION

The prevalence of epithelial abnormality in camp population is 1.25% and, in the hospital, population is 2.5%. The common cytopathological pattern seen in both camp and hospital population was NILM, non-specific inflammation, specific inflammation including bacterial vaginosis and candidiasis. Among the epithelial abnormalities detected, in the camp population it was LSIL (1.25%) and in the hospital population it was ASC-US, LSIL and HSIL (0.80%) each. Although diverse epithelial abnormalities were detected in the hospital population, presence of a relatively high proportion of LSIL cases in the asymptomatic camp population warrants screening of the general population.

Hence on a routine basis, every woman above the age of 21 should have a Pap smear done and this must be continued even in post-menopausal period. We propose that larger studies are required to estimate the pattern of cervical cytological abnormalities along with detection of common HPV strains.

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