PAP smear findings in Premenopausal and Post-menopausal Women
- A Comparative Study

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Abstract:

Background: Cervical cancer incidence is found to be decreasing in India but it continues to be a major public problem for women in India. Pap smear is a simple test devised to detect the premalignant lesions of cervical cancer and hence Pap smear is one of the best screening tools available for early detection of cervical cancer. The risk for cervical cancer increases as the age advances and hence screening at an early age is mandatory to decrease the occurrence for cervical cancer.

Materials and Methods: A retrospective study was conducted at Department of Pathology, Sree Balaji Medical College & Hospital over a period of one year from September 2015 to September 2016 in which all the Pap smears reported in that period were included.

Results: A total of 978 PAP smears were reviewed out of which 59% of the smears were from pre menopausal women and 41% of the smears were from post menopausal women. We found that prevalence of pre malignant and malignant lesions were common among the women of post menopausal age group than pre menopausal age group.

Conclusion: PAP smear screening is essential at an early age since it has been observed in our study that both premenopausal and postmenopausal women are at risk for epithelial abnormalities, though postmenopausal women are at a higher risk compared to premenopausal women.

Key words: Carcinoma cervix, PAP smear, Premenopausal, Postmenopausal.

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Introduction:

Carcinoma cervix worldwide accounts for 15% of all cancers diagnosed in women\[^1\]. All over the world, cervical cancer is a common cancer with an estimate of 440,000 new cases occurring every year\[^2\]. According to National Cancer Registry Program of India, it is estimated that in India, approximately 100,000 women develop cervical cancer each year. Cervical carcinoma is a preventable disease in the vast majority of women. Fortunately, the natural history of cervical cancer is such that it is possible to detect it early during a pre invasive curable stage by screening and early intervention thereby preventing progression into life threatening illness \[^3\]. Pap smear is one of the best screening tool available for preventing cervical cancer. The most widely used system for describing PAP smear is The Bethesda System , 2001 \[^4\]. Pap smear cervical cytology with sensitivity of 72% and specificity of 94% is suitable for population based screening programme \[^5\]. Women in advancing age are at a higher risk of cervical carcinoma and present frequently at a later stage due to the lack of awareness and knowledge. The mortality rate of cervical cancer can be significantly reduced if a woman is screened once when she is between the ages of 40-45 years\[^6\].

The present study is to compare the prevalence of pre malignant and malignant lesions of the cervix in the women of pre and post menopausal age group.

Materials and Methods:

This was a retrospective study of all cervical Pap smear cases reported at the Department of Pathology, Sree Balaji Medical College and Hospital, Chennai, India for a period of 1 year from October 2015 to September 2016. Smears were taken by trained doctors using modified Ayres wooden spatula which was inserted and rotated 360° over cervix. Both ectocervix and endocervix were sampled. Samples were received in coplin jar (2 smears) dipped in isopropyl alcohol from the Dept of Obstetrics and Gynaecology, Sree Balaji Medical College & Hospital. Two smears were prepared, one stained with Haematoxylin and Eosin and other with Pap stains. All the smears were evaluated for adequacy and subsequently examined and reported as per guidelines of the Bethesda system.

Results:

A total of 978 cases were reported in the above mentioned period and all the cases were analysed. The age of the patients ranged from 24 yrs. to 79 yrs, of which 578 women (59%) were in pre menopausal age group and 400 women (41%) were in
post menopausal age group. Table 1 shows the different pathologies reported in the premenopausal and postmenopausal women.

**PRE MENOPAUSAL AGE GROUP:**

Among 978 women, 578 women fell under the premenopausal age group, of which 252 (43.5%) had normal pap smears, inflammatory smear without any underlying pathology was seen in 292 (50.5%) women, Sexually Transmitted Diseases (STDs) namely Trichomonas vaginalis, Candida albicans, Bacterial vaginosis were also diagnosed in the cytology smears. Bacterial vaginosis was seen in 6 women (1.0%), Trichomoniasis was found in 3 women (0.5%), candidiasis was found in 15 women (2.6%). LSIL was diagnosed in 6 (1.0%) women, HSIL was seen in 2 woman (0.3%), and squamous cell carcinoma was found in 2 (0.3%) woman.

**POST MENOPAUSAL AGE GROUP:**

Among 978 women, 400 of them fell in the post menopausal category. Normal PAP smear results were found in 139 (34.75%) women, Inflammatory smear without any underlying pathology was in 164 cases (41%), STDs like candidiasis was seen in 9 (2.2%) cases and bacterial vaginosis was seen in 7 (1.8%) cases. LSIL was diagnosed in 20 (5%) women, HSIL was seen in 6 women (1.5%), Atypical Glandular Cells was

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**Chart 2: PAP smear diagnosis in post menopausal women**

- **NORMAL SMEAR: 34.75%**
- **INFLAMMATION WITHOUT ANY UNDERLYING PATHOLOGY: 41%**
- **INFLAMMATORY SMEAR WITH INFECTIONS: 4%**
- **LSIL: 5%**
- **HSIL: 1.5%**
Table 1: Distribution of lesions of cervix in pre menopausal and postmenopausal women n=978

<table>
<thead>
<tr>
<th>PAP smear findings</th>
<th>Pre menopausal age group</th>
<th>Post menopausal age group</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>252 (25.7%)</td>
<td>139 (14.2%)</td>
<td>391 (40.0%)</td>
</tr>
<tr>
<td>inflammatory smear without underlying pathology</td>
<td>292 (29.9%)</td>
<td>164 (16.8%)</td>
<td>456 (46.7%)</td>
</tr>
<tr>
<td>Inflammatory smear with infections:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bacterial vaginosis</td>
<td>24 (2.5%)</td>
<td>16 (1.6%)</td>
<td>40 (4.1%)</td>
</tr>
<tr>
<td>Trichomoniasis</td>
<td>06 (0.6%)</td>
<td>07 (0.7%)</td>
<td>13 (1.3%)</td>
</tr>
<tr>
<td>Candidiasis</td>
<td>03 (0.3%)</td>
<td>00 (0%)</td>
<td>03 (0.3%)</td>
</tr>
<tr>
<td></td>
<td>15 (1.6%)</td>
<td>09 (0.9%)</td>
<td>24 (2.5%)</td>
</tr>
<tr>
<td>*LSIL</td>
<td>6 (0.6%)</td>
<td>20 (2.1%)</td>
<td>26 (2.7%)</td>
</tr>
<tr>
<td>**HSIL</td>
<td>02 (0.2%)</td>
<td>06 (0.6%)</td>
<td>08 (0.8%)</td>
</tr>
<tr>
<td>***AGC</td>
<td>0</td>
<td>01 (0.1%)</td>
<td>01 (0.1%)</td>
</tr>
<tr>
<td>Squamous cell carcinoma</td>
<td>2 (0.2%)</td>
<td>13 (1.3%)</td>
<td>15 (1.6%)</td>
</tr>
<tr>
<td>Atrophic smear</td>
<td>0</td>
<td>41 (4.2%)</td>
<td>41 (4.2%)</td>
</tr>
<tr>
<td></td>
<td>578 (59%)</td>
<td>400 (41%)</td>
<td>978 (100%)</td>
</tr>
</tbody>
</table>

*LSIL- Low Grade Squamous Intra epithelial Lesion; **HSIL- High Grade Squamous Intra epithelial Lesion; ***AGC - Atypical Glandular Cells
found in 1 case (0.25%) and squamous cell carcinoma was found in 13 (3.2%) woman. Atrophic smear was seen in 41 (10.3%) cases.

**Discussion:**

Cervical carcinoma has been the most important cancers among women in the past two decades. In India the peak age for cervical cancer incidence is 55–59 years. Current data from the National Cancer Registry Program (NCRP) indicates that the most common sites of cancer among women are the breasts and the cervix\(^7\). Cancer cervix is considered to be an ideal gynaecological malignancy for screening of the premalignant epithelial abnormalities as it meets both test and disease criteria for screening. It has a long latent phase which enables pathologists to diagnose cervical carcinoma at a very early stage\(^8\). Conventional PAP smears were used throughout this study. During conventional PAP smear processing, many limiting factors for reporting are observed such as drying artifact, inadequate fixation and background staining.

In the present study, the prevalence of Low grade Squamous Intraepithelial Lesion is 4.8 times higher in the postmenopausal age group than the premenopausal age group.
Similarly the prevalence of High grade Squamous Intraepithelial Lesion and Squamous cell carcinoma are also 1.5 times and 3 times more in the postmenopausal age group women respectively. This is in concordance with Janki Patel et al. (9) Elhakeem et al(10) also recorded a progressive increase in development of LSIL to invasive carcinoma with increasing age. Ranaba SK et al(11) found that eighty percent of all the epithelial abnormalities like squamous and glandular lesions were found in women >40 years of age. The average age of patients for all the epithelial abnormalities was 49 years. JS Mishra et al (12) also has pointed that in out of 36484 women studied, 12681 women were above 40 yrs of age in which 10.1% had SIL and 1.3% had Ca cervix.

In the present study, the inflammatory smear was found to be more common in premenopausal age group women than postmenopausal age group women. The STDs namely Trichomonas vaginalis, Candida albicans and bacterial vaginosis were also diagnosed in the cytology smears, and was more among the premenopausal women. Out of 578 premenopausal women studied, 24 women reported inflammatory smear with infections (4.2%) like bacterial vaginosis (0.6%), Trichomoniasis(0.5%) and Candidiasis (2.6%). In post menopausal age group 164 women (41%) had inflammatory smear without any underlying pathology, STDs like candidiasis was seen in 9 (2.2%) cases and bacterial vaginosis was seen in 7 (1.8%) cases. This is in concordance Ranabat SK et al (11) where women of age group between 21 to 80 were studied and in which 26% reported inflammatory smear, 1% reported candidiasis, 0.45% had Trichomoniasis, 7.6% had Bacterial vaginosis and 0.34% had Herpes simplex virus infection.

Ranabat SK et al (11) also showed Atypical Squamous Cells of Undetermined Significance (ASCUS) 2 %, Atypical Glandular Cells (AGC) 2% , LSIL 3 %, HSIL 6% and Squamous carcinoma 2 % in which 75 % (1.5%) of ASCUS was in postmenopausal age group, no AGC was reported in postmenopausal age group, 83.3% (2.5%) of LSIL was in postmenopausal age group, 66.4%(4%) of HSIL and the 100% (2%) of squamous cell carcinoma were in the postmenopausal age group which also favours the present study.

In JS Misra et al(12) cervical biopsy was taken in all cases of severe dysplasia and the cytology report showed 100%
compatibility with histopathology. Cervical biopsy was performed in only 182 of the 219 cases of frank carcinoma cervix diagnosed on cytology. The compatibility between histology and cytology was 100%. However, 29 fresh cases of cervical carcinoma were reported on histology. The cytologic findings in these 29 cases had been inflammatory in 21 and inadequate smear in 8. The percentage of false negatives with cytology, for diagnosis of invasive carcinoma of cervix, was thus 10.3% (21/203).

Though conventional PAP smear was used in this study, various studies have demonstrated significant relationship between conventional pap smear, Liquid based cytology (LBC) and Colposcopy method. Karimi-zarchi et al. has compared the results of conventional pap smear, Liquid based cytology and Colposcopy method and found that Colposcopy with sensitivity of 70.9% can be stated to be superior than LBC pap with sensitivity of 55.3%. In the comparison of compliance of the conventional pap smear with that of the LBC, no significant relationship was found. and the study proved, general colposcopy method has a higher sensitivity in diagnosis of any cervical lesions compared to the conventional pap smear and liquid-based pap smear.

**Conclusion:**

Squamous intraepithelial lesions are more common in the postmenopausal age group compared to the premenopausal age group. But yet, screening by PAP smear is essential in both the groups for early detection and management of epithelial abnormalities. We recommend at least a single life-time PAP screening cytology of the uterine cervix of all the women aged 40 to 50 years as there is a rapid increase cervical cancer mainly among in post menopausal age group women.

**References:**


