Analysis of abnormal cervical cytology in Papanicolaou smears at tertiary care center – A retrospective study

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Abstract
Objective: Cervical cancer is the second most common cancer in women worldwide after breast cancer, and in developing countries, the leading cause of death by cancer. It is one of the most preventable and curable of all cancers. Most women are never undergoing a cervical Pap smear screening. The Objective is to study the role of Pap smear in detecting premalignant and malignant lesions as well as non-neoplastic lesions of cervix and to determine the prevalence of various lesions.

Methods: This retrospective study of 500 women with age group 18 to 90 years was carried out over a 2 years at cytology section of pathology department, M.P.Shah medical college, Jamnagar. This study had been divided into 2 groups. Group I included study of 400 women who attended gynaecological clinic at GGH hospital Jamnagar and Group II included study of 100 women who attended Pap smear screening camp at Air force hospital, Jamnagar. Pap smears were prepared and after fixation and staining, each smear was carefully examined.

Results: In this study, Low-grade squamous intraepithelial lesions was the most common with 62 cases (12.4%) followed by High-grade squamous intraepithelial lesions with 25 cases (5%), then atypical squamous epithelial cells of undetermined significance 14 cases (2.8%), Squamous cell carcinoma 12 cases (2.4%), AGCUS 6 cases (1.2%), AGCUS probably neoplastic origin 1 case (0.2%) and other rare tumors- 1(0.2%) case of granulosa cell tumor and 1 case(0.2%) of clear cell carcinoma were seen. The average age of women for all the epithelial abnormalities was 49 years.

Conclusion: Pap smear is a simple, cheap, safe and practical diagnostic tool for early detection of cervical cancer in high risk group population, so it should be established as a routine screening procedure. It also has a greater role in diagnosis of inflammatory lesions including the identification of causative organism, atrophic changes, changes of radiation therapy and some rare tumors. It is recommended that at least a single life-time pap screening cytology of uterine cervix of all the women aged 40 to 50 years.

Key words: Pap smear, Cervical cancer, The Bethesda System

I. Introduction

The Papanicolaou (Pap) smear was introduced in 1941 and became the standard screening test for cervical cancer and premalignant lesions¹. Cervical cancer is the second most common cancer in women worldwide after breast cancer, and in developing countries, the leading cause of death by cancer. Cervical cancers in the early stage of development, or carcinomas in situ, are highly treatable because the cancer cells are located in a layer of cells in or around the cervix and have not spread to other parts of the body. Once the cancer cells metastasize to other parts of the body the disease is more difficult to treat and cervical cancer treatment becomes more complex².

Though pap test plays a stellar role in detection of carcinoma and precancer, its role in diagnosis of infective inflammatory conditions including the identification of causative organism, hormone related benign epithelial changes and changes due to therapeutic agents is no less successful¹.

Originally, the term Pap smear was used for smears made out of posterior fornix material for purpose of detection of cancer and precancer lesions. But presently, the term is used for smear made from material collected from vagina, endocervical canal, ectocervix or vaginal vault³.

The randomized examination of cervical PAP smears in women with vaginal discharge showed that cervical infections, intraepithelial neoplasia of various grade and invasive cervical carcinoma are much more common in Georgia as compared to the Western countries. The possible reason for this fact is the absence of cervical screening program, low social-economic status, and lack of awareness of cervical cancer prevention by PAP smears⁴.

The simplicity, effectiveness and versatility of Pap test have made it an integral part of routine clinical examination and large chunk of workload in gynecological and pathological practice is due to this test⁵.
2. Materials and Methods

In present study results of PAP smears obtained from 500 women were analyzed, which had been examined in cytology section (Department of Pathology, M.P. Shah Medical College, Jamnagar) during 2 years from 2008 to 2009. The mean age of the women was from 18 to 90 years.

The study was conducted on 500 pap smears prepared from women of two groups. In group I, 400 women were included who attended gynecological clinic, Guru Gobind Singh Hospital, Jamnagar with various complaints like vaginal discharge, prolapsed uterus, pain in lower abdomen, vaginal bleeding etc. In group II, a study included Pap smear screening camp at Air force hospital, Jamnagar in which total 100 women participated.

It was ensured that no local douche, antiseptic cream and no local internal examination was done on day of test. The patient was placed in dorsal lithotomy position and a Cusco’s bivalve speculum was introduced through vagina and cervix was visualized. The longer projection of the Ayre’s spatula was placed in the cervix near squamo-columnar junction and rotated through 360 degree. The cellular material thus obtained was quickly, but gently smeared on a clean glass slide. The glass slide was then immediately put into the coplin jar containing 100% methanol (fixative), stained by Pap method (RAPID-PAP kit).

The cytological interpretation of smears was made according to the New Bethesda System 2001.

3. Results

A total of 500 cases were analyzed during above mentioned period. The age of the women ranged from 20 to 81 years with an average age of 36.7 years. Most of women were in age group of 30-39 years (Table1).

Table 1: Age-wise distribution of total number of patients

| Age- group(years) | Number of cases | Percentage % |
|-------------------|-----------------|--------------|
| 20-29             | 67              | 13.4         |
| 30-39             | 167             | 33.4         |
| 40-49             | 140             | 28.0         |
| 50-59             | 60              | 12.0         |
| 60 or more        | 66              | 13.2         |
| Total             | 500             | 100          |

Twenty four (4.8%) smears were found to be unsatisfactory for evaluation. One hundred and nineteen (23.8%) were normal. The incidence of cervical cancer has decreased more than 50% in the past 30 years because of wide spread screening with cervical cytology. In 1975, the rate was 14.8 per 100,000 women in the United States and by 2006; it had been reduced to 6.5 per 100,000 women. Mortality from the disease has undergone a similar decrease.

The result of present study and their correlation with other workers are discussed below in following paragraphs:

4. Discussion

The incidence of cervical cancer has decreased more than 50% in the past 30 years because of wide spread screening with cervical cytology. In 1975, the rate was 14.8 per 100,000 women in the United States and by 2006; it had been reduced to 6.5 per 100,000 women. Mortality from the disease has undergone a similar decrease.

The result of present study and their correlation with other workers are discussed below in following paragraphs:

Table 2: Finding of Pap smear cytology

| Sr no. | Diagnosis                        | Number of cases | Percentage (%) |
|--------|----------------------------------|-----------------|----------------|
| 1      | Unsatisfactory for evaluation    | 24              | 4.8            |
| 2      | Normal                           | 119             | 23.8           |
| 3      | Negative for intraepithelial lesion | 235       | 47.0           |
| 4      | ASCUS                            | 14              | 2.8            |
| 5      | LSIL                             | 62              | 12.4           |
| 6      | HSIL                             | 25              | 5.0            |
| 7      | Squamous cell carcinoma          | 12              | 2.4            |
| 8      | AGCUS                            | 6               | 1.2            |
| 9      | AGCUS probably neoplastic origin | 1               | 0.2            |
| 10     | Adenocarcinoma                   | 0               | 0              |
| 11     | Others: Granulosa cell tumor     | 1               | 0.2            |
|        | Clear cell carcinoma             | 1               | 0.2            |
| Total  |                                  | 500             | 100            |

Table 3: Age-wise, Finding of Pap smears cytology

| Age- group (years) | Number of cases | ASCUS | LSIL | HSIL | Squamous cell carcinoma | AGCUS | AGCUS probably neoplastic origin | Adenocarcinoma | Others | Total No. of Abnormal finding | Percentage (%) |
|--------------------|-----------------|-------|------|------|--------------------------|-------|-------------------------------|----------------|--------|------------------------------|----------------|
| 20-29              | 67              | 5     | 5    | 0    | 0                        | 3     | 0                             | 0              | 1      | 13                           | 2.6             |
| 30-39              | 167             | 6     | 14   | 3    | 2                        | 1     | 1                             | 0              | 0      | 27                           | 5.4             |
| 40-49              | 140             | 4     | 22   | 7    | 1                        | 2     | 0                             | 0              | 0      | 36                           | 7.2             |
| 50-59              | 60              | 0     | 10   | 5    | 2                        | 0     | 0                             | 0              | 1      | 18                           | 3.6             |
| 60 or more         | 66              | 0     | 11   | 10   | 7                        | 0     | 0                             | 0              | 0      | 28                           | 5.6             |
| Total              | 500             | 14    | 62   | 25   | 12                       | 6     | 1                             | 0              | 0      | 122                          | 24.4            |

(2.8%)

(12.4%)

(15%)

(2.4%)

(1.2%)

(0.2%)

(0%)

(0.4%)

(2%)

(0.4%)

(2%)

(0.4%)

(2%)
Table 4: Comparison of findings of Pap smear cytology with other studies

| Name of workers | No. of cases | Inadequate (%) | Normal (%) | Atrophic changes (%) | Inflammatory Lesions (%) | SIL (%) | Invasive carcinoma (%) |
|-----------------|--------------|----------------|------------|----------------------|-------------------------|---------|------------------------|
| Judado and Ranade (1979) | 1200 | - | 20.84 | - | 65 | 13.33 | 0.83 |
| Yajima et al (1982) | 959475 | - | - | - | - | - | - |
| Beinton et al (1986) | 130 | - | 20 | - | 59.23 | 11.15 | 2.69 |
| Mital et al (1989) | 250 | - | 40.65 | - | 12.70 | 40.65 | 6.00 |
| Chauhan et al (1990) | 5778 | - | 9.76 | - | 69.19 | 2.28 | - |
| Spinella et al (1997) | 1483 (postmenopausal) | - | 17.39 | 72.96 | 9.64 | - | - |
| Tabrez et al (1999) | 460(p) | 8.30 | 54.16 | - | 23.30 | 12.58 | 1.66 |
| Thomas et al (2000) | 85(p) | 5.88 | 58.82 | - | - | - | - |
| Karuna et al (2003) | 100(p) | - | 31 | - | - | 12 | - |
| Mishra & Panday (2003) | 76(p) | - | - | - | - | 11.3 | - |
| Sherwan et al (2007) | 160 | - | 85 | - | - | 11.2 | 3.7 |
| Present study | 400 | 13.25 | 1.50 | 3 | 53 | 21 | 3 |

Above table shows that higher incidence of inadequate smears in present study, lower incidence of diagnosed as normal smears as received smears were usually suggestive of abnormal cervical pathology. Incidence of atrophic changes was lower in present study compare to other study which included only postmenopausal group. Incidence of inflammatory lesions, SIL, and invasive carcinoma was comparative to others studies9,12,17.

Table 5: Comparison of findings of Pap smear cytology with other studies

| Name of workers | No. of cases | ASCUS % | LSIL % | HSIL % | Squamous cell carcinoma % | AGCUS % |
|-----------------|--------------|---------|--------|--------|---------------------------|---------|
| Beinton et al (1986) | 130 | 6.93 | 8.46 | 2.69 | - | - |
| Karuna et al (2003) | 100(p) | 6 | 7 | 5 | - | 3 |
| Sherwan et al (2007) | 160 | 10.6 | 0.6 | 3.7 | - | - |
| Present study | 400 | 0.72 | 15.80 | 0.00 | 0.03 | 0.00 | 0.15 |

Incidences of HSIL, squamous cell carcinoma was comparative to other study.

A study done in Nepal has shown that 80% of all abnormal epithelial lesions were found in age-group above 40 years as about 80% of the patients were above the age of 30 years20. The American Cancer control program and IARC have suggested similar or slightly modified screening programs21.

5. Conclusion

Cervical cancer is one of the most common malignancies in women of developing country like India. Pap smear is a simple, cheap, safe and practical diagnostic tool for early detection of cervical cancer in high risk group population, so it should be established as a routine screening procedure. It also has a greater role in diagnosis of inflammatory lesions including the identification of causative organism, atrophic changes, changes of radiation therapy and some rare tumors. It is recommended that at least a single life-time pap screening cytology of uterine cervix of all the women aged 40 to 50 years.

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