Analysis of cervical cytology in tertiary care hospital

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ABSTRACT

Background

Cancer of the cervix is the third most common cancer in women. In Nepal and other developing countries cervical cancer is the leading cause of morbidity and mortality. Cancer of cervix is readily preventable, and can be diagnosed at the pre-invasive stage with cytological screening with Papanicolaou (Pap) smears.

Method

This is a retrospective study aimed to evaluate all previously conducted cervical smears examined at Grande International hospital during a one-year period. Pap smear cytology reports were obtained and data noted in a structured Performa. All the smears were reported as per the 2001 Bethesda system.

Result

A total of 3202 Pap smears were examined. Maximum number of patients was in the age group of 36 to 50 years. A total of 3161 smears were reported as Negative for Intraepithelial Lesion or Malignancy (NILM), of which 2944 showed normal cytological findings and 217 were inflammatory. The abnormal cases comprised of two cases with ASC-US, 33 cases of LSIL, 4 cases of HSIL, and 2 cases of invasive Squamous cell carcinoma.

Conclusion

Premalignant and malignant lesions of cervix can be diagnosed easily by Pap smears.

Keywords: **Cervical cancer detection, Papanicolaou test, Liquid-based cytology**

Introduction

Cervical cancer is the second most common cancer in females and is a major cause of morbidity and mortality. Pap smear is simple, cost effective and sensitive tool for screening of various non-neoplastic and neoplastic lesions of cervix

Carcinoma cervix is one of the leading causes of death of the female population in developing countries. By virtue of its accessibility, cancer of the cervix can be easily diagnosed. Cancer of the cervix is the second most common cancer type amongst women worldwide, as about 500,000 new cases and 250,000 deaths each year indicate (WHO, 2010). If treated in the earlier stages the patient can often be cured of the disease. Cervical cancer is known to be preventable because of the long pre-invasion period and the availability of appropriate screening methods.

Cervical cancer is very common and preventable cancer. The difference in incidence between developing and developed countries, where cervical cancer cases have been significantly reduced, in developed countries. In our country we don't have national data but in India the burden

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of cervical cancer is more than 10 lacks[1]. If cervical cancer detected earlier then it can be treated well. Unlike other malignancies, cervical cancer is easily detected and readily preventable disease[2]. Once cervical cancer progress to higher stage, then it becomes more difficult to treat and results are not that good. Screening programs are the effective ways to reduce the incidence and mortality significantly. The incidence of cancer and deaths from cervical cancer has significantly declined over the years because of prevention, screening, and early detection by the Pap test. Pap smear is simple, cost effective and sensitive tool for screening of various precancerous and cancer of cervix. Although cervical cancer is preventable through regular screenings using Pap smear, cervical cancer remains a prevalent women's health issue across the world.

Since the introduction of the Pap smear by Dr. George Papanicolaou in 1941, cervical cytology has become the main diagnostic tool to detect cervical cancer. It is the standard screening test for cervical cancer and premalignant lesions, and is being used globally[3, 4]. Literature shows that there is a reduction in the incidence and mortality due to invasive cervical cancer worldwide because of early detection and screening; this is possible because the Pap test detects early cervical epithelial cell abnormalities and mild-to-severe dysplasia to invasive cancer and facilitates early diagnosis[5, 6, 7]. This test not only plays a crucial role in the detection of cervical cancer and its precursor lesions but also aids in the diagnosis of other conditions as well such as infective and inflammatory conditions. Being simple, effective, and versatile, the Pap smear becomes an integral part of routine clinical examination and large population at risk can be screened. Pap smear screening has sensitivity of 50%–75% and specificity of 98%–99%[8].

Materials and methods

This is retrospective epidemiological study conducted in the Grande International Hospital. Data retrieved from Hospital information system from January 2017 to December 2017. All the patients who visited in the Gynecology OPD and wellness center were included. The samples were collected only after proper counseling and consent from the patients who visited the hospital for various gynecology complaints and for general health check up. Women not willing to give consent for Pap smear, already diagnosed case of cancer cervix, women who were pregnant, woman who used local douche or antiseptic cream, and woman who had Pap smear testing less than six months earlier were excluded from the study.

The patient was placed in lithotomy position A Pap smear is performed by opening the vaginal canal with a Cusco's bivalve speculum , and the cervix was visualized and collecting cell at the outer opening of the cervix at the transformation zone (where the outer squamous cervical cells meet the inner glandular endocervical cells), using an a cytobrush rotated through 360°. The smear material gently spread on a clean glass slide. The glass slide was then immediately put into jar containing 100% methanol (fixative) which was then sent to laboratory for microscopic examination. Other sample was taken for liquid based cytology; The head of the brush is shaken into a labeled container of liquid containing preservative solution. The cytological interpretation of smears was made according to the New Bethesda System for Reporting Cervical Cytology 2014. Based on Bethesda system, lesions are broadly divided into negative for intraepithelial neoplasia and epithelial cell abnormalities including squamous and glandular cells. (2001) as follows:

a. Adequacy of sample
   - Satisfactory
   - Unsatisfactory

b. Squamous cell abnormalities
   - Atypical squamous cells (ASCs)
   - ASC of undetermined significance (ASC-US)
   - ASC that cannot rule out high-grade lesion (ASC-H)
   - Low-grade squamous intraepithelial lesion (LSIL)
   - High-grade squamous intraepithelial lesion (HSIL)
   - Squamous cell carcinoma (SCC)

c. Glandular cell abnormalities
   - Atypical glandular cells, specify site of origin, if possible
   - Atypical glandular cells, favor neoplasia
   - Adenocarcinoma in situ
   - Adenocarcinoma

Exclusion criteria

- Who had gynecologic cancer;
- Who had received a hysterectomy;
- Who were pregnant or in the 3-month postpartum period.

- Women who had abnormal Pap test results, including atypical squamous cells of undetermined significance (ASCUS), low-grade squamous intraepithelial lesion (LSIL), and HSIL were sent for a colposcopic examination and biopsy for histopathological examination.
- All the women with abnormal results detected in Pap smear were advised for follow-up and treatment as per the standard guidelines by the WHO
- Data collected were analyzed using Epi info Windows. Categorical data were presented as percentage (%). Normally distributed data were presented as means and standard deviation. The objectives of the study were to detect early cervical neoplasia in women visited this hospital.

Results:

There were 3202 patients included in the study. Our result showed the mean age was 39.93± 9.49 years (ranging from 21 to 71 years). Most of them were of (1627 patients 50.8%) 36 to 50 years age group, whereas 35%,, 13.2% 0.7% and 0.2 % (patients were of 21 to 35, 51 to 60, above 66yrs and less than 20 years respectively.) Table: 1

3161 (98.7%) samples were normal NILM out of that 217 (6.8%) were suggestive of inflammatory lesion. We had highest number of cases of low grade squamous intraepithelial lesion (LSIL), and 4 cases HSIL, 2 samples showed ASCUS and 2 cases revealed squamous cell carcinoma. Table: 2

Cross tabulation with age and diagnosis is presented in table 3. Ethnicity and diagnosis is being presented in the table 4.

Table 1: Age demography

Age category	n (%)
≤ 20	7 (0.2)
21-35	1122 (35)
36-50	1627(50.8)
51-65	423(13.2)
>66	23(0.7)
Mean age + SD	**39.93+9.49**
Total	**3202**

Table 2: Outcome of PAP smear

Pap Results	n (%)
LSIL	33(1)
HSIL	4(0.1)
ASCUS	2(0.1)
Squamous cell carcinoma	2(0.1)
Total NILM	3161(98.7)
Total	**3202**

Discussion

Unlike most other types of cancer, it is preventable when precursor lesions are detected and treated. Screening can reduce both the incidence and mortality of cervical cancer. Cervical cancer can be prevented, can be diagnosed at an early stage, as the cervix is an organ easily accessible to clinical evaluation. The rate of cervical cancer has significantly reduced in developed countries due to performing cytology-based screening programs in recent years[18].

Early treatment of precancerous changes (cervical dysplasia) detected on the Pap smear can stop cervical cancer before it fully develops. A woman may have cervical cancer and not know it because

Table 3: Cross tabulation age with outcome

Age category	Diagnosed Problems				
	ASCUS n (%)	HSIL n (%)	LSIL n (%)	NILM n (%)	Squamous cell carcinoma n (%)
<20	0	0	0	7	0
21-35	1(50)	0	11(33.3)	1110(35.1)	0
36-50	0	3(75)	17(16.8)	1606((50.8)	1(50)
51-65	1(50)	1(25)	4(12.1)	417(13.2)	0
>66	0	0	1(3)	21(0.7)	1(50)
Total	**2(100)**	**4**	**33(100)**	**3161(100)**	**2(100)**

Table 4: Cross tabulation Ethnicity with outcome

Ethnicity	Pap Result				
	ASCUS n (%)	HSIL n (%)	LSIL n (%)	NILM n (%)	Squamous cell carcinoma n (%)
Chhetri	1(50)	2(50)	8(24.2)	712(22.5)	1(50)
Brahmin	0	0	13(39.3)	1000(31.6)	0
Janjati	1(50)	2(50)	10(30.3)	1288(40.7)	1(50)
Dalit	0	0	2(6.1)	124(3.9)	0
Foreigner	0	0	0	37(1.2)	0
Total	**2(100)**	**4(1000**	**33(100)**	**3161(100)**	**2(100)**

she may not have any symptoms. The disease is also more prevalent in women from lower socioeconomic group and rural areas.

The Pap smear test used as a screening method to detect cervical cancer is an effective way to prevent the development of cervical cancer. Cervical cancer is the most common female genital tract malignancy among Nepalese women. Cervical cancer can be prevented and premalignant conditions can be diagnosed before invasion by different tests[15]. Implementation of Pap testing was responsible for reducing the incidence of cervical cancer between 1955 and the mid-1980s[9]. The conventional pap smear technique has been used for screening of cervical cancer since 1940s but has high false-negative rates due to inadequate sample, sampling errors, presence of obscuring materials, screening and interpretation errors[12,13]. Liquid-based cytology (LBC) has advantages of fewer unsatisfactory smears, faster and more efficient method, more accurate interpretation, less obscuring materials such as blood, mucous, inflammatory cells in smears and the use of residual cell suspension[14].

Cervical cytology is currently widely used as the most effective cancer screening modality. Objective data from hospital-based studies are required in order to detect the efficiency of the screening tests. This study contributes to assessing current levels of cervical screening by both conventional pap smear as well as through liquid based cytology at Grande International hospital.

In our study, the age of patients with abnormal smears was (36 to 50) years.

This study determines 3161 cases (98.7%) of negative for any intraepithelial lesion or malignancy with non-specific inflammation 217(6.8%). Like in our study other studies have revealed 95% and 74.3% cases of NILM respectively[10, 11].

It is well established that onaverage it takes approximately 10 years for a CIN 2,3 lesion to progress to an invasive cancer (i.e. the transit time)[16].

No population-based estimates of cervical cancer incidence in Nepal exist, but WHO has estimated that the incidence rate is approximately 26-28 per 100 000 women per year. Though the prevalence of cervical cancer in Nepal is not well documented, it is the most commonly reported malignancy among women in Nepal with approximately 2150 invasive cervical cancers and 1100 deaths annually[17].

Liquid based cytology enables the use of supplementary methods in the diagnosis and prognosis of cervical lesions[18].

Liquid based cytology was significantly more sensitive than conventional cervical cytology for detecting premalignant condition of cervix[16].

Qureshi et al evaluated the effectiveness of VIA and VILI compared to Pap smear as screening methods for carcinoma of the cervix, the results were as follows: Pap smear test (sensitivity 20.83%, specificity 98.38%), VIA (55.5%, 71.39%), and VILI (86.84%, 48.93%). They concluded that VIA and VILI are less specific in comparison to the Pap smear but they are more sensitive in detecting pre-invasive lesions. Hence VIA and VILI can be used as cervical cancer screening tools in low-resource settings[10, 19].

Conclusion

Cervical cancer is a preventable disease due to the long preinvasive stage. Cytology is a simple and inexpensive diagnostic method and is therefore especially useful in areas with limited resources. Even though the Pap smear test alone does not

have a high sensitivity and specificity, it is the most commonly used test in most screening programs[2].This clinical audit was done to find out the prevalence of abnormal Pap smear results. Pap smear is a very effective screening tool for early detection of premalignant and malignant lesions of the cervix.

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