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Evaluation of the Pattern of Cervical Pap Smear Cytology and to Correlate it with Histopathological Findings

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ABSTRACT
To evaluate the pattern of cervical Pap smear cytology and to correlate it with histopathological findings. Two hundred tenfemale participants, aged 18 to 60 yearswere enrolled. Cervical smears were taken with the help of Ayer's spatula and cyto brush to collect specimen from the squamocolumnar junction. The smears were stained with Papanicolaou stain (PAP stain) and slides were examined under light microscope following 2014 Bethesda system. The age group 21-30 years had 58 patients, 31-40 years had 80, 41-50 years had 130 and 51-60 years had 42 patients. The difference was significant ($p<0.05$). The maximum number of cases 114 were categorized as negative for intraepithelial lesion or malignancy (NILM). Atypical squamous cells of undetermined significance(ASCUS) wereseen in 52 cases followed by low-gradesquamous intraepithelial lesion (LSIL) in 26 and high-gradesquamous intraepithelial lesion (HSIL) in 10, adenocarcinoma in 4 and squamous cell carcinoma in 4 cases. 86%diagnosed on Pap smears correlated on histopathology findings. It has been discovered that Pap smears are useful for early detection of premalignant and malignant cervix lesions.

INTRODUCTION

With 570,000 new case reports in 2018, uterine cervical cancers, are the fourth most frequent cancer in women globally, accounting for 6.6% of all malignancies in women[1]. Roughly 90% of deaths took place in low- and middle-income nations, and it is well-recognized that mortality can be decreased with a comprehensive strategy that includes efficient screening techniques, early detection, and prevention by high-risk HPV vaccination[2].

The goal of screening techniques is to identify precancerous alterations, which have a high risk of HPV infection as their primary cause and could develop into cancer if left untreated. A woman's cancer can be treated early or prevented by following up and changing her screening status if there are abnormal changes[3]. The World Health Organization recommends cervical cytology, visual inspection of the cervix uteri and HPV tests, which are mostly based on molecular technologies, as screening procedures in this scale[4].

The present scientific and therapeutic foundation for cervical cancer prevention and treatment is provided by histopathology and cytopathology[5]. Histopathology uses microscopic cell organization patterns in tissue sections from biopsy or surgical specimens to classify them into diagnoses that guide cancer and precancer treatment decisions[6]. Additionally, histopathology is still significant because it is the most commonly utilized clinical endpoint used to assess the effectiveness of novel methods for preventing cervical cancer[7].We performed this study to assessthe pattern of cervical Pap smear cytology and to correlate it with histopathological findings.

MATERIALS AND METHODS

After considering the utility of the study and obtaining approval from the ethical review committee, we selectedtwo hundred tenfemale participants, aged 18-60 years. Patient's consent was obtained before starting the study. Data such as name, age, etc. was recorded. Ayer's spatula and cytobrush were used to help collect cervical smears from the squamocolumnar junction. A spotless glass slide was rapidly covered with the cellular material that had been collected using the spatula and cytobrush. There were two smears ready. After that the glass slides were submitted to the pathology lab and quickly fixed by being submerged in a coplin jar filled with 95% ethyl alcohol. Disposable speculums were utilized for the examination. Papanicolaou stain (PAP stain) was used to stain the smears and slides were inspected under a light microscope using the Bethesda system from 2014.The results were compiled and subjected to statistical analysis using theMann-Whitney U-test. $p>0.05$ was regarded as significant.

RESULTS

Age group 21-30 years had 58 patients, 31-40 years had 80, 41-50 years had 130 and 51-60 years had 42 patients. The difference was significant ($p<0.05$) (Table 1).

The maximum number of cases 114 were categorized as negative for intraepithelial lesion or malignancy (NILM). Atypical squamous cells of undetermined significance(ASCUS) wasseen in 52 cases followed by low gradesquamous intraepithelial lesion (LSIL) in 26and high gradesquamous intraepithelial lesion (HSIL) in 10, adenocarcinomain 4 and squamous cell carcinoma in 4 cases (Table 2). Table 3 shows that 86%diagnosed on Pap smears correlated on histopathology findings (Table 3).

DISCUSSIONS

Uterine cervical cancer ranks among the world's major causes of death and morbidity for women. It is the most prevalent gynecological cancer and one of the main causes of cancer-related deaths among women in poor nations[8,9]. This situation results from a lack of knowledge and a poor adoption of cervical cancer screening services, particularly in developing nations with low incomes[10]. At a mean age of 54, cervical cancer is a malignant illness of the cervix that often develops in the fifth or sixth decade of life[11,12]. A pre-malignant stage of the disease typically affects younger women under 40. Cervical cancer deaths are terrible because the disease progresses slowly and has a detectable precursor condition called carcinoma[13,14].We performed this study to assessthe pattern of cervical Pap smear cytology and to correlate it with histopathological findings.

Our results showed that the age group 21-30 years had 58 patients, 31-40 years had 80, 41-50 years had 130 and 51-60 years had 42 patients. Asotic *et al*.[15] observed that out of the overall sample of 5894 (92.44%) patients, 395 (6.20%) had L-SIL and H-SIL (PAPA III) findings. The PHD result of the cervical biopsy following L-SIL and H-SIL (PAPA II and IV) differs statistically significantly from the other results. The largest statistical margin was found in the relationship between CIN II alterations and cytological findings, which are provided at the Clinic of Obstetrics and Gynecology and other medical facilities. They concluded that the age group of 0-29 years old has the highest percentage of patients with L-SIL and H-SIL findings. The average age of patients in 2011 was 31.12±9.12 years, and statistical analysis has demonstrated a favorable trend in the frequency of younger patients with L-SIL and H-SIL (PAPA III and IV). Our results showed that the maximum number of cases 114 were categorized as negative for intraepithelial lesion or malignancy (NILM). Atypical squamous cells of undetermined significance(ASCUS)

Table 1: Patients distribution

Age group (years)	No.	p-value
21-30	58	0.05
31-40	80	
41-50	130	
51-60	42	

Table 2 Cyto-histopathological correlation of Pap smears and cervical biopsies

Cytological diagnosis	Chronic cervicitis	Chronic cervicitis with squamous metaplasia	CIN I	CIN II	CIN III	Adenocarcinoma	SCC
NILM (114)	80	25	9	-	-	-	-
ASCUS (52)	10	17	25	-	-	-	-
LSIL (26)	-	10	16	-	-	-	-
HSIL (10)	-	2	4	3	1	-	-
Adenocarcinoma (4)	-	-	-	-	-	4	-
SCC (4)	-	-	-	-	-	-	4

Table III Correlation between Pap smear and histopathological diagnosis

Histopathological Pap smear	Positive	Negative	Total
Positive	120	30	150
Negative	6	54	60
Total	126	84	210

were seen in 52 cases followed by low-gradesquamous intraepithelial lesion (LSIL) in 26 and high-gradesquamous intraepithelial lesion (HSIL) in 10, adenocarcinoma in 4 and squamous cell carcinoma in 4 cases. To determine the accuracy of Pap tests and gauge their effectiveness in diagnosing cervical lesions, Bindroo *et al*.[16] linked the Pap smear diagnosis with histology. A histopathological diagnosis was made on 250 Pap smears. Of the 250 Pap smears, the majority of patients (32%) were multipara and fell within the 41-50 age range. Maximum instances were reported as NILM (59%) followed by ASCUS (16%), LSIL (15%), HSIL (7%), squamous cell carcinoma (1.6%) and 0.8% incidences of adenocarcinoma were found. On histology, 41.2% cases were identified as chronic cervicitis, 27.2% cases as chronic cervicitis with squamous metaplasia, CIN I (22.4%), CIN II (4.0%), CIN III (2.8%), squamous cell carcinoma (1.6%) and 0.8% cases of adenocarcinoma. Overall positive predictive value, specificity and sensitivity value, negative predictive value and diagnostic accuracy was 75.24%, 97.98-96.20%, 85.38-88.8% respectively.

We observed that 86% diagnosed on Pap smears correlated on histopathology findings. Demir *et al*.[17] study comprised Pap smear specimens that were histopathologically diagnosed as cervical biopsy, conization, curettage, or hysterectomy within three months and were archived for four years. The histological and cytological diagnoses that had been made in the three months that followed were compared in the retrospective analysis and the rates of false-positive and false-negative results were computed. The independent class ratio false-positive and false-negative rates in the cyto-histological comparison were 19-4,3%, respectively. Excluding unusual types of cytologic diagnoses, the sensitivity, selectivity, positive and negative predictive values were 69%, 98%, 89-93%, respectively.

CONCLUSION

It has been discovered that Pap smears are useful for early detection of premalignant and malignant cervix lesions.

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