



MORPHOMETRIC ANALYSIS OF PAP SMEARS AND CERVICAL BIOPSIES.

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ABSTRACT **Background:** In women malignant lesions of the cervix are the most frequent cause of mortality and morbidity and cervical cancer is the third most common cause of cancer deaths worldwide. Cervical cancer incidence is progressively reducing due to the routine use of Pap smears and cervical biopsy. Aim of the study is to use Image Morphometric Software in order to create macro-images to analyze a large number of cells at a given time. **Methods:** A one year retrospective study was conducted in the Department of Pathology, Dr PSIMS & RF and data pertaining to all pap smears and their corresponding biopsies were reviewed. Each case was analysed with respect to age, and symptoms of the patient. **Results:** A total of 30 patients aged between 35 and 70 years for whom both cervical biopsy and pap smears were done were studied over a period of 1 year. Based on Age, Symptoms, both pap smears and cervical biopsies were taken and studied. Among the biopsies studied 60% were diagnosed as Chronic Cervicitis aged between 35 to 45 years, distribution of lesions include : Endocervical Polyp (20%) aged between 45 to 50 years, Moderate Dysplasia (10%) aged between 55 to 60 years, Moderately differentiated Squamous Cell Carcinoma (10%) aged between 60 to 70 years. Among pap smears 60% inflammatory smears, 20% polypoidal endocervicitis, 10% ASCUS, 10% LSIL. **Conclusion:** Testing cervical epithelium by Pap smear is a very simple useful, economical and safe tool for early detection of premalignant and malignant cervical lesions. Gold standard is histopathological examination. The correlation studies are very important tools that can be used in the quality assurance of cytology laboratories.

KEYWORDS : Pap smears, Cervical Biopsy, inflammatory, Chronic Cervicitis, ASCUS, LSIL, Moderate Dysplasia.

INTRODUCTION:

- In women malignant lesions of the cervix are the most frequent cause of mortality and morbidity and cervical cancer is the third most common cause of cancer deaths worldwide.
- Cervical cancer incidence is progressively reducing due to the routine use of Pap smears and cervical biopsy [1].
- A Pap smear, also called a Papanicolaou smear, is a microscopic examination of cervix cells that are scraped off in order to look for malignant or precancerous disorders as well as other diseases.
- It was named after Dr. George N. Papanicolaou, who originally described it in 1928.
- It is a screening test that checks for alterations in the cervix's transformation zone, which are most frequently brought on by HPV.
- Sample is taken from the transformation zone.[2]
- Pap smear includes squamous epithelial cells (superficial, intermediate, parabasal, basal cells), endocervical cells.[3]
- Measurements of Superficial cells – Cytoplasm (35000 to 40000 nm) Nucleus (4000 to 5000 nm).
- Measurements of Intermediate cells – Cytoplasm (25000 to 30000nm) Nucleus (7000 to 8000 nm)
- The intermediate cell nucleus is the key reference in evaluation of dysplasia.
- A dysplastic cell has 3–5 times the area of an intermediate cell nucleus. Cytoplasmic disintegration (cytolysis) is a feature of intermediate cell.
- In LSIL there is mild nuclear enlargement with irregular contour, fine chromatin and nuclear cytoplasmic ratio is less. Koilocytes are present.
- In HSIL nuclear enlargement is moderate and show pleomorphism with irregular border and coarse chromatin. Nuclear cytoplasmic ratio is high.
- In Squamous Cell Carcinoma cells show moderate pleomorphism with high N/C ratio. Nucleus is hyperchromatic with irregular coarse chromatin and nucleoli are seen. cytoplasm is orangeophilic and the background is dirty with RBC and necrotic tissue fragments.
- Microscopic evaluation of Pap slides makes screening easy because it provides large number of slides so that no single cell is missed.
- Histopathological diagnosis of Cervical biopsy is the Gold Standard.
- In cervical biopsy CIN (cervical intraepithelial neoplasia) is classified as CIN1, CIN2, CIN3 based on how much epithelial tissue has abnormal cells.[4]
- CIN 1: abnormal cells affecting about one-third of the thickness of the epithelium.
- CIN 2: abnormal cells affecting about one-third to two-thirds of the epithelium.
- CIN 3: abnormal cells affecting more than two-thirds of the epithelium.
- Cervical dysplasia CIN 1 frequently resolves on its own and seldom progresses to malignancy. More people with CIN 2 and 3 are likely to need treatment to ward off cancer.

MATERIAL AND METHODS:

This is a retrospective study done in Department of pathology, Dr PSIMS & RF for a period of 1 year. Both Pap smears and Cervical biopsies were taken for 30 cases. Pap slides were stained and screened and biopsies were processed, H&E stained slides from paraffin embedded blocks were studied.

RESULTS:

- In the study most of the cases aged between 35 to 45 years were diagnosed as Chronic Cervicitis and their corresponding pap smears were diagnosed as Inflammatory smears.
- Among 30 patients 18 patients (60%) aged between 35 to 45 presented with abnormal and irregular cycles.
- Their cervical biopsies were diagnosed as Chronic Cervicitis.
- 6 cases (20%) aged between 45 to 50 years presented with dysmenorrhea. Cervical biopsies - Endocervical Polyp Pap smears - Polypoidal Endocervicitis.
- 3 cases (10%) aged between 50 to 60 presented with cervical erosion. Cervical biopsies - Moderate Dysplasia. Pap smears - Atypical Squamous cells of Undetermined Significance.
- 3 cases (10%) aged between 60 to 70 years presented with post menopausal bleeding. Cervical biopsies - Moderately differentiated squamous cell carcinoma.
- Pap smears - Low grade intra epithelial lesion.

FIGURE 1: PIE DIAGRAM SHOWING FREQUENCY OF DISTRIBUTION IF DIFFERENT TYPES OF LESIONS

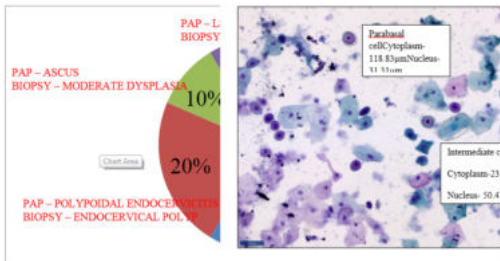


FIGURE 2: LIQUID BASED CYTOLOGY PAPSMEAR
FIGURE 3: INFLAMMATORY SMEARS

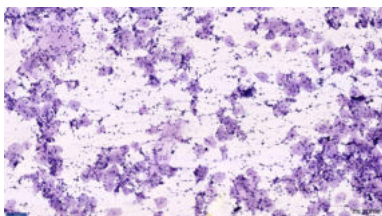


FIGURE 4 : ASCUS CELL MEASUREMENTS SHOWING INCREASED SIZE OF NUCLEUS AND NUCLEAR CYTOPLASMIC RATIO, ALSO HYPER CHROMATIC NUCLEUS

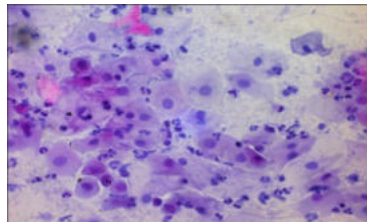


FIGURE 5 : LSIL SHOWING CLUSTER OF CELLS WITH MILD NUCLEAR ENLARGEMENT AND PLEOMORPHISM WITH HYPERCHROMASIA, IRREGULAR CONTOUR, FINE CHROMATIN AND ABSENT NUCLEOLI

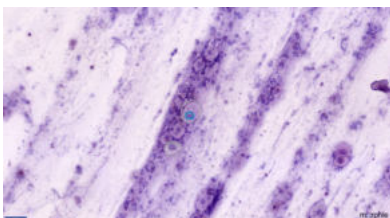


FIGURE 6 : CERVICAL EPITHELIUM SHOWING DYSPLASIA

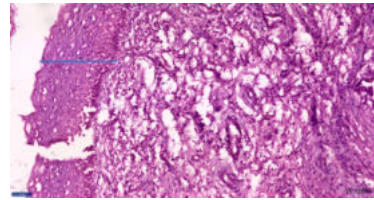
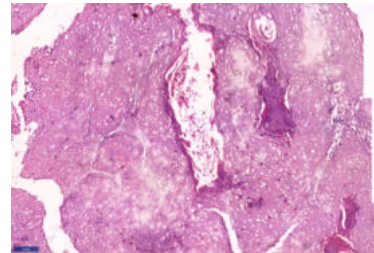


FIGURE 7 : SQUAMOUS CELL CARCINOMA OF CERVIX



DISCUSSION :

- Premalignant and malignant lesions of cervix can be treated successfully if they are diagnosed early.[5]
- Early diagnosis can be done by Pap Smear examination.
- Since the tissue study has been the gold standard, cervical biopsies were done and morphometrically analysed.
- Nuclear and cytoplasmic morphometry of exfoliative cytology.
- Lining epithelium on histopathological examination was found to be a useful objective way and an adjunct to conventional microscopy in identifying following lesions of cervix[6] Inflammatory, Premalignant and Malignant cervical lesions.
- In our study, all the cases of pap smears are correlated with histopathology.
- Most of the cases were with inflammatory smear and histopathological diagnosis was chronic cervicitis aged between 35 to 45 years with symptoms irregular cycles
- Patients aged 50 to 70 years were diagnosed with malignancy.
- Pap smear with ASCUS show[7] increased cellular size increased nuclear size increased nuclear cytoplasmic ratio.
- Pap smear with LSIL show [8] Cellular pleomorphism Increased nuclear size Irregular nuclear border.
- These abnormal cases were correlated by doing histopathological examination.
- Moderate dysplasia is observed in patients aged between 50 to 60 years.
- Squamous cell carcinoma is observed in patients aged 60 to 70 years.

CONCLUSION:

- Testing cervical epithelium by Pap smear is a very simple useful, economical and safe tool for early detection of premalignant and malignant cervical lesions.
- Our study observed that cervical cytology is a sensitive test in diagnosing cervical neoplasia.
- Gold standard is histopathological examination.
- The cytological and histopathological findings and diagnosis were correlated significantly in the epithelial lesions of the cervix.
- These correlation studies are very important tools that can be used in the quality assurance of cytology laboratories.

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