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A correlation study of cervical cytology on pap smear with cervical biopsy in a tertiary care hospital (1 Year Study)

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Abstract

Introduction: 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. The Pap smear is the standard screening tool used to test for the presence of abnormal cells that could become cancerous. A regular Pap smear provides an opportunity to detect pre-cancerous cells in the cervix. The simplicity, effectiveness and versatility of Pap test have made it an integral part of routine clinical examination and large chunk of workload in gynaecological and pathological practice is due to this test.

Aims and Objectives: To establish usefulness of pap smears examination as a diagnostic tool for detection of cervical lesions.

Material and Method: In present study results of 400 PAP smears are analysed, which had been examined in cytology section (Department Of Pathology, M.P. Shah Medical College, Jamnagar) during 1 years (July 2021 to July 2022). Out of 400 pap smear 250 patients were undergone cervical biopsy or hysterectomy. So the final sample size is 250. The conventional cervical smears were fixed by 100% methanol and stained by Pap method (RAPID-PAP).

The cytological smears were reported using Bethesda System 2001. The cervical biopsies or hysterectomy specimens received from the same patients were fixed in 10% neutral buffered formalin solution and processed with embedding in paraffin blocks and stained with haematoxylin and eosin (H and E) stain. The histopathological findings and Pap smear findings were correlated and histopathological diagnosis of biopsies were taken as the gold standard.

Result: In present study most common complain was irregular menstrual bleeding followed by lower abdominal pain. Out of 250 pap smears maximum patient belong to 41-50 years and were multipara. Maximum cases were reported as NILM (60%), followed by ASCUS (15.2%), LSIL (12%), HSIL (8%), squamous cell carcinoma (4.8%). On histopathology, 47.6% cases were diagnosed as chronic cervicitis, 23.2% cases as chronic cervicitis with squamous metaplasia, CIN I (17.2%), CIN II (4.4%), CIN III (2.8%), squamous cell carcinoma (4.8%). Overall sensitivity, specificity, positive predictive value and negative predictive value is 95.8%, 83%, 70%, 98% respectively.

Conclusion: Pap smear is a simple cheap safe and practical diagnostic tool for early detection of cervical cancer in high risk group population and therefore should be established as a routine screening procedure.

Keywords: Pap smear, cervical cancer

Introduction

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 [1]. The Pap smear is the standard screening tool used to test for the presence of abnormal cells that could become cancerous. A regular Pap smear provides an opportunity to detect pre-cancerous cells in the cervix. Cervical cancers in the early stage of development, or carcinomas in situ, are highly treatable because the cancer cells are 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 complex [2].

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 successful [3]. Originally, the term Pap smear was used for smears made out of posterior fornix material for purpose of detection of cancer and pre-cancer lesions. But presently, the term is used for smear made from material collected from vagina, endocervical canal, ectocervix or vaginal vault [3].

The simplicity, effectiveness and versatility of Pap test have made it an integral part of routine clinical examination and large chunk of workload in gynaecological and pathological practice is due to this test [5].

Aims and Objectives

- 1) To establish usefulness of pap smears examination as a diagnostic tool for detection of cervical lesions.
- 2) To detect cervical cancer and its precancerous lesions at an early stage by pap smear examination.
- 3) To implicate the Bethesda System of reporting during assessment of Pap smear.
- 4) To create awareness about the importance of pap smear examination.
- 5) To find out incidence, prevalence of various lesions among symptomatic females.
- 6) To screen the women being a high risk groups for preinvasive and invasive lesions.
- 7) To correlate cytological findings with histopathological findings

Material and Method

In present study results of 400 PAP smears are analysed, which had been examined in cytology section (Department Of Pathology, M.P. Shah Medical College, Jamnagar) during 1 years (July 2021 to July 2022). Out of 400 pap smear 250 patients were undergone cervical biopsy or hysterectomy. So the final sample size is 250. The mean age of the patients was from 18 to 90 years. All the patients had various complains including vaginal discharge, itching etc. The conventional cervical smears were fixed by 100% methanol and stained by Pap method (RAPID-PAP). The clinical data were collected by gynaecologists, including the

exact day of menstrual cycle, age of the patient, previous treatment options and etc.

The cytological smears were reported using Bethesda System 2001. The cervical biopsies or hysterectomy specimens received from the same patients were fixed in 10% neutral buffered formalin solution and processed with embedding in paraffin blocks and stained with haematoxylin and eosin (H and E) stain. The histopathological findings and Pap smear findings were correlated and histopathological diagnosis of biopsies were taken as the gold standard.

Inclusion Criteria

- 1) Sexually active married women
- 2) Discharge from vagina, abdominal pain, irregular menstrual bleeding, post menopausal bleeding and post coital bleeding

Exclusion Criteria

Unsatisfactory smears

Statistical Analysis

Patients information obtained from requestion form and cytohistological correlation done in tabulated form and statistically analysed.

Result

In present study most common complain was irregular menstrual bleeding followed by lower abdominal pain. Out of 250 pap smears maximum patient belong to 41-50 years and were multipara. Maximum cases were reported as NILM (60%), followed by ASCUS (15.2%), LSIL (12%), HSIL (8%), squamous cell carcinoma (4.8%). On histopathology, 47.6% cases were diagnosed as chronic cervicitis, 23.2% cases as chronic cervicitis with squamous metaplasia, CIN I (17.2%), CIN II (4.4%), CIN III (2.8%), squamous cell carcinoma (4.8%). Overall sensitivity, specificity, positive predictive value and negative predictive value is 95.8%,83%,70%,98% respectively.

Table 1: Cyto-histopathological correlation of Pap smears and cervical biopsies/ hysterectomies

Cytological diagnosis	No of cases on pap smear	Chronic cervicitis	Chronic cervicitis with squamous metaplasia	CIN I	CIN II	CIN III	Sec
NILM	150(60%)	115	32	3	-	-	-
ASCUS	38 (15.2%)	4	19	15	-	-	-
LSIL	30 (12%)	-	6	24	-	-	-
HSIL	20 (8%)	-	1	1	11	7	-
SCC	12(4.8%)	-	-	-	-	-	12
Total	250 (100%)	119(47.6%)	58 (23.2%)	43 (17.2%)	11 (4.4%)	7 (2.8%)	12 (4.8%)

Table 2: Correlation between Pap smear and histopathological diagnosis

Histopathology/pap smear	Positive	Negative	Total
positive	70	30	100
negative	3	147	150
Total	73	177	250

Table 3: Sensitivity and Specificity of Pap smear

Sensitivity	95.8%
Specificity	83%
Positive predictive value	70%
Negative predictive value	98%

Table 4: Comparison of present study with similar studies

Study	Sensitivity (%)	Specificity (%)	Positive predictive value (PPV) (%)	Negative predictive value (%)
Present study	95.8	83	70	98
Patil <i>et al.</i> [8] (2016)	77.7	84.2	70	88.8
Bamanikar <i>et al.</i> [9] (2016)	89.47	88.70	82.92	-
Dhakar <i>et al.</i> [10] (2016)	77.80	100	100	97
Atla <i>et al.</i> [11] (2015)	94.11	64.28	82.75	85.0
Joshi <i>et al.</i> [12] (2015)	65.38	95.83	94.4	71.8
Chaudhary <i>et al.</i> [13] (2014)	79.37	81.02	65.79	89.52

Discussion

In our retrospective study 250 cases were studied for cervical cytology and to find its correlation with histopathological diagnosis. Findings were recapitulated and compared with the results of other studies. In our study, the majority of patients were of the age group of 41-50 years (32%) which was comparable to other studies done by Joshi *et al.*^[8] (50%), Bamanikar *et al.*^[9] (28.46%) and Parija *et al.*^[10] (37.15%). The commonest complaint was whitish discharge per vaginum (46%) which was similar to studies done by Joshi *et al.*^[8] (40%), Atla *et al.*^[11] (41%), Dhakal *et al.*^[12] (40%) and Alakananda *et al.*^[13] (51%). In our study NILM (60%) was similar to studies done by Alakananda *et al.*^[13] (55%), Atla *et al.*^[11] (53%) and Joshi *et al.*^[8] (64%). In our study 38 cases of ASCUS correlated on histopathology in which 15 cases revealed CIN I on biopsy findings while 23 cases revealed cervicitis with or without metaplasia similar to studies by Alakananda *et al.* The reason behind this discrepancy of cytology on histopathology was that those cases had cervical erosions or ulcers, hence there was inflammatory atypia and these cells on Pap smears were considered as atypical squamous cells. In our study, 30 cases of LSIL correlated with histopathological diagnosis in which 24 cases showed CIN I while 6 cases showed chronic cervicitis with metaplasia. 20 cases of HSIL correlated with the cervical biopsy diagnosis which was comparable to the diagnosis made by Atla *et al.*^[11] (99%). On Pap smears 12 cases were diagnosed as squamous cell carcinoma respectively which showed 100% correlation on histopathology. In our study, the overall accuracy in our study was comparable to Atla *et al.*^[11] (83.33%), Patil *et al.*^[15] (82.1%) and Joshi *et al.*^[8] (80.0%) (Table 4). In our study, the overall accuracy in our study was comparable to Atla *et al.*^[11] (83.33%), Patil *et al.*^[15] (82.1%) and Joshi *et al.*^[8] (80.0%) (Table 4). This study shows a good correlation between Pap smear and cervical histology.

Conclusion

Pap Smear is a simple cheap safe and practical diagnostic tool for early detection of cervical cancer in high risk group population and therefore should be established as a routine screening procedure. Cervical biopsy is the gold standard for confirmation and should be carried out to confirm the findings of Pap smear.

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