

# A Study of Papanicolaou Smear (PAP Test) in Pregnant Women

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## ABSTRACT

**Introduction:** Carcinoma cervix is the most common genital tract cancer encountered in developing countries accounting for 18% of world cases in India. Cervical cancer is the most common malignancy diagnosed during pregnancy comprising about 70%. Papanicolaou smear is an important tool for diagnosing pre-invasive cervical neoplasia and is a novel development in the field of exfoliative cytology. In India, pregnancy is often the first visit of a woman to a health care facility and thus provides an important opportunity to screen the woman and counsel her regarding the importance of Pap test and follow up. Aim & objectives: To study the role of PAP test as a screening tool for carcinoma cervix and to detect other abnormalities in pregnant population.

**Material and methods:** This prospective study was done on all antenatal women attending OPD during November 2016 to October 2017 in the Department of Obstetrics and Gynecology, RMCH, Bareilly. After an informed consent, the PAP Smear was taken. The cytological abnormalities were reported as per modified Bethesda classification and reporting system 2001. Inclusion Criteria: All pregnant women upto 28 weeks of gestation who came for their first antenatal checkup. Exclusion Criteria: 1)Patients with vaginal infection. 2) History of sexual intercourse in the past 48 hours. 3)History of vaginal douching in the past 48 hours. 4)History of vaginal medication in the past 48 hours. 5) Threatened abortion. Data of all patients attending antenatal OPD during November 2016 to October 2017 was analyzed using PS2 software.

**Results:** The study comprised of 300 pregnant women and most of them belonged to younger age group, providing the clinician an opportunity to screen as well as to educate them regarding the importance of Pap smear screening. A fair number of inflammatory etiologies like Bacterial vaginosis, Trichomoniasis and Candidiasis were also found in our study which can be treated to avoid an adverse pregnancy outcome.

**Conclusion:** Not many ASCUS, LSIL and HSIL were identified. This could be because of limited sample size and thus larger studies are required to know the prevalence of abnormal Pap smears in pregnancy.

**Keywords:** Atypical Squamous Cells of Undetermined Significance, Bacterial Vaginosis, Cervical Intraepithelial Neoplasia, High Risk Human Papilloma Virus, High Grade Squamous Intraepithelial Lesion, Low Grade Squamous Intraepithelial Lesion, Negative For Intraepithelial Lesion/ Malignancy, Papanicolaou, Polymerase Chain Reaction, Squamous Intraepithelial Lesion

## INTRODUCTION

Carcinoma cervix is the most common genital tract cancer encountered in developing countries accounting for 80% of world cases of which 18% are from India. It is the 5th

most deadly carcinoma worldwide. Cervical cancer is the most common malignancy diagnosed during pregnancy comprising about 70%.<sup>1</sup>

Papanicolaou test (Pap test) detects 60-70% of cancer cervix. The accuracy of Pap smear in pregnancy is almost similar to that of non-pregnant women. Pap smear in pregnancy is useful to screen more number of women in the reproductive age group. About 3% of cases of cervical cancer are diagnosed during pregnancy, and these cases correspond to half of the cases of neoplasia diagnosed during the gestational period.<sup>2</sup> The Papanicolaou (Pap) smear is the most successful screening test for carcinoma in the history of medicine. Its simplicity, low cost, and low false-negative rate have added to its success. The Pap test's main benefit is the early detection of preneoplastic lesions. The Pap test is also used to diagnose several infectious agents that manifest with specific cytologic features. Hormonal evaluation based on smears of the lateral vaginal wall is another important use of the Pap test.<sup>3</sup>

The direct precursor of cervical cancer is represented by Cervical Intraepithelial Neoplasia (CIN), that is usually detected and managed through the Papanicolaou (Pap) test cytological screening and/or high-risk Human Papillomavirus (hr-HPV) DNA testing. The incidence of abnormal cervical cytology during pregnancy is at least as high as that reported for non-pregnant women. As matter of fact, almost 1% of the population of childbearing women annually screened for cervical cancer will be diagnosed with CIN of various degrees. Thus, it is strongly recommended that all pregnant patients undergo cervical screening at the time of their initial prenatal visit, as pregnancy can represent a unique opportunity to approach otherwise unscreened women.<sup>4</sup>

## MATERIAL AND METHODS

This prospective study was done on all antenatal women attending antenatal OPD during November 2016 to October 2017 in the Department of Obstetrics and Gynecology, Rohilkhand Medical College & Hospital, Bareilly.

After an informed consent, the woman was placed in lithotomy position. After exposing the cervix, endocervix was sampled using cytobrush and ectocervix by using Ayer's

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spatula, rotating 360 degrees and smearing on glass slide followed by immediate fixation with isopropyl alcohol and subsequent staining with Papanicolaou stain. The cytological abnormalities were reported as per modified Bethesda classification and reporting system 2001.

**Inclusion Criteria:** All pregnant women up to 28 weeks of gestation who came for their first antenatal checkup.

**Exclusion Criteria:** 1) Patients with vaginal infection. 2) History of sexual intercourse in the past 48 hours. 3) History of vaginal douching in the past 48 hours. 4) History of vaginal medication in the past 48 hours. 5) Threatened abortion. All the details were filled in a case study form specially prepared for the purpose and analysed statistically.

### Ethics

This prospective study was carried out after taking approval from the Institutional Ethics Committee.

### STATISTICS

Data of all patients attending antenatal OPD during November 2016 to October 2017 was analyzed using PS2 software. Mean and standard deviation was calculated.

### RESULT

It was Observed that maximum women that is 41.75% (125) were in the age group of 21-25 years followed by 31.7% (95) in the age group 26-30 years. The distribution at 20 years of age or below and above 30 years was 13.3% (40). The mean age in the study was 26.2 + 4.98 yrs.

Out of 300 patients, 155 (51.7%) resided in rural areas and 145(48.3%) women were residents of urban dwellings. Out of all patients, 68.3% (205) were multigravida and 31.7% (95) were primigravida as shown in Table 1.

It was seen that 185 (61.7%) women were <20 weeks of gestation at the time of examination and 115 (38.3%) women were 20 weeks of gestation or more as depicted in Table 2. The mean gestational age was 16.76+ 6.80 years.

In this study, maximum women not use any form of contraceptive method study, it was seen that maximum women did not use any form (85%), 13.7% women used barrier contraceptive and 1.7% used OCP's prior to pregnancy. None of the women in the study used IUCD as a form of contraception. We observed that 205 (68.3%) women had a normal per speculum examination, 35 (11.7%) women had cervical erosion and 60 (20%) women had vaginal discharge as shown in Table 3.

The adequacy of smear was studied before a thorough cytological examination and it was seen that 295 (98.3%) smears were adequate for cytological examination 5 (1.7%) smears were inadequate as shown in Table 4.

The cytological examination of all the smears taken in the study were reported as per Modified Bethesda System. It was observed that 250 (83.3%) smears were inflammatory / negative for intraepithelial lesion or malignancy (NILM), 30(10%) smears were reported as having bacterial vaginosis. The percentage of smear reported, as having Trichomoniasis and Candidiasis 1.7% each. Furthermore, ASCUS was

Gravidity	Number	Percentage
Primigravida	95	31.7%
Multigravida	205	68.3%
Total	300	100%

**Table-1:** Distribution of cases according to gravidity

Gestational age	Number	Percentage
<20 Weeks	185	61.7%
≥20 Weeks	115	38.3%
Total	300	100%

**Table-2:** Distribution of cases according to gestational age

Per speculum examination	Number	Percentage %
Normal	205	68.3%
Erosion	35	11.7%
Discharge	60	20.0%
Total	300	100%

**Table-3:** per speculum finding of cases

Adequacy of smear	Number	Percentage %
Adequate	295	98.3%
Inadequate	5	1.7%
Total	300	100%

**Table-4:** adequacy of smear

Pap smear report as per modified bethesda system	Number	Percentage %
Inflammatory/nilm	250	83.3%
Trichomoniasis	5	1.7%
Bacterial vaginosis	30	10.0%
Candidiasis	5	1.7%
ASCUS	5	1.7%
LSIL/HSIL	Nil	-
Inadequate	5	1.7%
Total	300	100%

**Table-5:** PAP smear report as per modified bethesda system

reported in 5(1.7%) smear and none of the smears showed LSIL/HSIL abnormality. 5(1.7%) smears were inadequate for cytological examination as per Table 5.

### DISCUSSION

A total of 300 patients were screened with conventional Pap test in the present study. In our study, maximum patients i.e. 125, belonged to age group of 21-25 years followed by 95 patients in the age group. The distribution of patients was largely in the reproductive age group of 26-30 years. The mean age was 26.2 + 4.98 years. In a study by N Nantaka Ngaojaruwong et. al. in Thailand, the mean age was 26.61 years and in another study by Ayten Dinc in Istanbul, Turkey the average age of pregnant women was 27.05 years. In a study by P. Himabindu et. al. at Vijaywada, most women were in the age group of 18-20 years followed by 21-23 years. Relatively fewer patients were in the age group of 24-29 years. Our results correlated with the study by Banumathy

Manikkam in Coimbatore where majority of patients were in the age group of 20-35 years.<sup>[1,5,6]</sup> Thus, most patients are in the prime of reproductive age group and hence give us an opportunity for screening and awareness of cervical cancer. Majority of women in our study were multigravida 68.3% and 31.7 were primigravida. This is in contrast with the study by Nantaka Ngaojaruwong et al conducted at Phramongkutkiao hospital, Bangkok, Thailand, in the year 2008. In their study, 42.2 % women were nulliparous and only 57.8 % women were multiparous. Another study by P. Himabindu et. al. at Siddhartha Medical College, Vijaywada, Andhra Pradesh conducted in the year 2010-2011, 45% women were primigravida.<sup>[5,6]</sup>

In our study, 61.7 % women were less than 20 weeks gestational age and 38.3% women 20+ weeks. In a study by Anakawan Ingsprasarn et. al. in Chonburi Hospital, Thailand in the year 2013, they found that 30.6% women belonged to 1st trimester, 56.6 % were in their 2nd trimester and 12.8% were in the 3rd trimester of their pregnancy. Another study was done by Banumathy Manikkam et. al. in Coimbatore, Tamil Nadu on Screening for cervical cancer during pregnancy from September 2012 to January 2014. They found that 91.5% women belonged to 3rd trimester followed by 17% women in 2 trimester. Therefore, we had a contrasting result with maximum women of our study belonging to <20 weeks gestational age. The exclusion criteria of our study being >28 weeks gestation seems a plausible explanation for the difference in results. In another study by Radha Bhai Prabhu et. al. at Meenakshi Medical College and Research Institute, Kancheepuram, Tamil Nadu; 56% women were at <12 weeks period of gestation followed by 24% women between 13-20 weeks gestation and 12% women between 21-24 weeks gestation.

In our study on per speculum examination of the cases, it was seen that 68.3% women had normal findings, 11.7% women had erosion and 20% women had discharge. In the study by Banumathy Manikkam in Coimbatore, Tamil Nadu, they found that 6.5% women had excessive vaginal discharge, 2% had pustules over vulva, 3.5% had erosion over the cervix and 1.5% had fungal infection. P. Himabindu et. Al found in their study that 90.5% women had healthy appearance of cervix. 9 % had erosion and 0.5% had a growth over the cervix. In the study by Radha Bai Prabhu et. al. marked cervical ectropion was found in 49% cases. The increase in vaginal discharge in all the above studies could be explained as a hormonal induced physiological finding. In our study we found that 98.3% smears were adequate for cytological examination and 1.7% smears were inadequate. In the study by Varsha Mishra et.al., 98.7% Pap smears were satisfactory. In another study by Banumathy Manikkam, among 200 cases, 98% were adequate smears and only 2% were inadequate. In the study by Esha Khanuja et. al., out of 100 women, 99 women were reported with adequate samples. The inadequacy of smears for cytological examination is usually due to air drying, scant cellularity or thick smear.

We studied the cytological smears according to Modified Bethesda System. In this study, we found that 83.3% smears

were inflammatory/NILM and 10% smears were reported as having Bacterial vaginosis. The percentage of smears having Trichomoniasis and Candidiasis was 1.7% each. Furthermore, 1.7% smears were reported as ASCUS and 1.7% smears were inadequate for cytological examination. In the study by P. Himabindu et. al. at Siddhartha Medical College, Vijaywada, Andhra Pradesh from June 2010 to October 2011, they found that 89.5% smears were inflammatory, 10% were normal and 0.5% had LSIL. In the study by Anakawan Ingsprasarn et. al. at Chonburi Hospital, Thailand between June and September 2013, they studied the Pap smear results among pregnant women at different age groups. They found that in the age group 21 years, out of total 173 women, 160 women had the report NILM, 5 cases had ASCUS and 1 was ASC-H. LSIL and HSIL were reported in 3 and 4 cases respectively. In the age group of 21-30 years, total 186 women were screened and 181 were reported NILM, 4 had ASCUS, 1 had the report of LSIL. In the age group of 31-40 years, 109 women were screened and 106 had the smears reported as NILM, 2 had LSIL and 1 had HSIL. In the age group > 40 years, 4 women were screened all had the report NILM. Therefore, a total of 472 women were screened of which 451 smears were NILM, which included 77 cases of Candida spp, 19 cases of Bacterial vaginosis and 9 cases of trichomoniasis. They studied that the prevalence of abnormal Pap smears was 2.7% in women aged 21 years or more with a 3% of HSIL and it was 7.5% in the younger group with 2.3% of HSIL. In another study by Banumathy Manikkam at Coimbatore, Tamil Nadu during the period September 2012 to January 2014, it was observed that 97.5% smears were normal inflammatory and 0.5% were reported as ASCUS. In the study by Nantaka Ngaojaruwong et. al. at Phramongkutkiao Hospital, Thailand between September 2006 and May 2007, they found that 146 out of 384 patients (38%) had abnormal Pap smear which included 144 cases (37.6%) of infection and 2 cases (0.4%) of LSIL. Candida was found in 90 cases (23.4%), Bacterial vaginosis in 53 cases (14%) and Trichomonas in 1 case (0.2%). Neither ASCUS nor HSIL was found in their study. In the study by Radha Bai Prabhu et al. at Meenakshi Medical College and Research Institute, Kancheepuram, from July 2013 to June 2014, they found that 91% cases were negative for intraepithelial lesion. ASCUS, LSIL and HSIL were each found in 0.3% cases. In their study, 4% cases had Candida infection. In the study by Ayten Dine at the Obstetrics and Gynecology Polyclinic of Bagcilar Training and Research Hospital in Istanbul, Turkey, between December 2008 and April 2009, they found that out of 110 pregnant women. 18.2% cases had an infection, 54.5% had reactive cellular changes and 0.9% had ASCUS. They also found that out of 86 non pregnant women of the same age group, 16.3% had an infection, 58.1% had reactive cellular change, 3.5% had ASCUS and 1.2% had LSIL.

## CONCLUSION

The present study comprised of 300 pregnant women, who were subjected to conventional Papanicolaou smear test. The smears were then evaluated according to The Modified

Bethesda system. We found that most of the women in our study belonged to younger age group, providing the clinician an opportunity not only to screen these women but also to educate them regarding the importance of Pap smear screening. A fair number of inflammatory etiologies like Bacterial vaginosis, Trichomoniasis and Candidiasis were also found in our study which can be treated in the antenatal period to avoid an adverse pregnancy outcome. Not many ASCUS, LSIL

and HSIL etiologies were identified in our study. This could be because of limited sample size and thus larger studies with more extensive sample size are required to know the prevalence of abnormal Pap smears in pregnancy.

Papanicolaou smear is an important tool for diagnosing pre-invasive cervical neoplasia and is a novel development in the field of exfoliative cytology. In India, pregnancy is often the first visit of a woman to a health care facility and thus provides an important opportunity to screen the woman and counsel her regarding the importance of Pap test and follow up. The results of Pap test in pregnancy and in non-pregnant state are comparable and thus all pregnant women should undergo Pap smear testing for the screening for cervical cancer. The results of Pap smear also helps to guide the management of diseases. Apart from invasive lesions, other inflammatory etiologies can be detected in Pap test and treated timely in order to prevent an adverse pregnancy outcome. Thus the role of Pap test in pregnancy goes beyond detection of pre-invasive lesion and is also an important tool for inflammatory pathologies like bacterial vaginosis, candidiasis and trichomoniasis, all of which are associated with adverse pregnancy outcome. Thus, Pap smear testing should become an integral part of routine antenatal care and post-natal follow up of women.

## REFERENCES

1. Himabindu P, Kanwal A, Vasudha. Pap Smear in Antenatal Women- Routine Screening in Low Resource Settings. *IOSR J Dent Med Sci.* 2015;14(4):4-5.
2. Gonçalves CV, Duarte G, Costa JSD da, Marcolin AC, Bianchi MS, Dias D, et. al. Diagnosis and treatment of cervical cancer during pregnancy. *Sao Paulo Med J.* 2009;127:359-65.
3. Shaw Patricia A. The History of Cervical Screening I: The Pap. Test. *J Soc Obstet Gynaecol Can.* 2000;22(2):110-4.
4. Origoni M, Salvatore S, Perino A, Cucinella G, Candiani M. Cervical intraepithelial neoplasia (CIN) in pregnancy: the state of the art. *Eur Rev Med Pharmacol Sci.* 2014;18:851-60.
5. Ngaojaruwong N, Vuthiwong C, Punpuckdeckoon P, Thongsorn N. Prevalence of abnormal Papanicolaou smear in pregnant women at Phramongkutklao Hospital. *Thai J Obstet Gynaecol.* 2008 Jul;16:179-85.
6. Manikkam B. Screening for cervical cancer during pregnancy. *Int J Community Med Public Health.* 2016;3(9):2493-8.

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