

# Prevalence of Abnormal PAP Smear in Pregnancy: A Hospital-Based Study in Western Nepal

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## Abstract:

**Introduction:** Cervical carcinoma is the third most common malignancy worldwide. The World Health Organization in 2014 reported the crude incidence rate of cervical cancer in Nepal as 24.2 per 100,000 women per year. This study was carried out with the aim of finding out the prevalence of cervical smear abnormality in pregnancy. **Methods:** An observational study was conducted in the department of Obstetrics and Gynecology of a tertiary center for a period of one year from May 2021 to April 2022. All pregnant women up to 28 weeks of gestation who had National Health Insurance coming for antenatal check-up underwent PAP smear test. The cytological results were reported based on the Bethesda classification system 2001. **Results:** Of 200 pregnant women enrolled in the study, the Pap smear report revealed that 32% of the study subjects had inflammatory smear showing candidiasis and bacterial vaginosis with reactive inflammatory changes. However, 66.5% of the subjects showed negative for intraepithelial lesion or malignancy and only 0.5% of subjects had signs related to carcinoma cervix in which the subject had a low-grade squamous intraepithelial lesion. No satisfactory sample was reported in 1% of the subjects. **Conclusion:** Pap smear during pregnancy not only gives the opportunity to screen but also helps to create awareness.

**Keywords:** Carcinoma cervix, Pap smear, Pregnancy.

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## INTRODUCTION:

Cervical carcinoma is the third most common gynecological malignancy.[1] There has also been an increased frequency of Cervical Intraepithelial Neoplasia (CIN) in pregnancy.[2] Early detection and treatment of precancerous lesions can decrease the incidence and risk of cervical carcinoma. In addition to the prevalence of risk factors like low socio-economy, high parity, early

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marriage in low and middle-income countries (LMICs), lack of awareness about cervical cancer and poor screening also contribute to the high incidence and mortality due to cervical cancer.[3] According to a report by WHO in 2014, the crude incidence rate of cervical cancer in Nepal was 24.2 per 100,000 women per year.[4]

The American College of Obstetrics and Gynecologists (ACOG) recommends cervical cancer screening be done every three years from the age of 21 years till 65 years.[3] Given the large number of follow up and even the first hospital visits during pregnancy, most pregnant women can be evaluated, identified and treated early in case of abnormal Papanicolaou (PAP) results. The accuracy of PAP smear in pregnancy is almost similar to that of non-pregnant state.[2] In addition to carcinoma, inflammatory conditions during pregnancy can also be identified and treated accordingly for the ongoing pregnancy to be uneventful.[3] While in high-income countries, PAP testing has become a routine in pregnant women, in LMICs like ours, screening is still not that common due to lack of awareness, fear, misconception and even shyness. To this researcher's best knowledge, there has been no published study done in pregnant Nepalese women till date. Hence, this study was undertaken to determine the prevalence of abnormal cervical smear and genital infections among antenatal women.

#### **METHODS:**

This was a hospital-based observational study conducted in the out-patient department (OPD) of Obstetrics and Gynecology in Lumbini Medical College and Teaching Hospital (LMCTH) over a period of one year from May 2021 to April 2022. The study was started after obtaining the approval from the Institutional Review Committee (IRC-LMC 03-B/021).

All the pregnant women presenting to Gynecology OPD till 28 completed weeks of

gestation having National Health Insurance were enrolled into the study. Those with history of per vaginal bleeding or actively bleeding, known case of CIN or cervical carcinoma and women who had a normal PAP smear report within one year were excluded from the study.

**Sample size:** The sample size was calculated using the following formula:

$$N = Z^2 p (1-p)/e^2$$

Where, N = minimum sample size,

p = proportion of cervical smear abnormality, taken as 90% from the study of Himabindu P et al.[5]

Z = 1.96 at 95% confidence interval level.

e=margin of error=5%

The minimum sample size calculated was 139.

A total of 200 antenatal women were included in the study. All women coming for antenatal check-up up to 28 weeks were explained about the study and informed consent taken. Data was collected using a preformed proforma which included information on the participants' demographic characteristics, obstetric history, and past history of cervical cytology screening, if any. Before the test all the participants were asked if they were aware about PAP test.

During examination, the participants were placed in dorsal position. After exposing the cervix using Cusco's self-retaining speculum, per speculum findings were noted. The ectocervix was sampled using an Ayre's spatula and smeared on a glass slide. It was immediately fixed with 95% ethyl alcohol, and sent to lab. It was evaluated and reported by the department of Pathology according to modified Bethesda Classification, 2001 as Negative for Intraepithelial Lesion or Malignancy (NILM), inflammatory, Atypical Squamous Cells of Undetermined Significance (ASCUS), Low grade Squamous Intraepithelial Lesion (LSIL), High grade

Squamous Intraepithelial Lesion (HSIL), ASC-H (Atypical Squamous Cells- cannot rule out High Grade Lesion) and Atypical Glandular Cell (AGC).[6]

Majority of the reports were collected by the participants themselves or their family members. Some defaulter cases' reports were collected by the researcher from the department of Pathology.

A healthy cervix was defined on the basis of naked eye observation of cervix on speculum examination. The cervix that looked pink, round, smooth with a central external os was said to be healthy.

The Microsoft Excel program 2016 version was used for data entry and management. Statistical Package for Social Sciences (SPSS) 18.0 software (SPSS Inc., Chicago, IL, USA) was used for statistical analysis. Descriptive statistics was used for demographic data and expressed in frequency and percentage.

**RESULTS:**

The most common finding in per speculum examination was a healthy cervix observed in 155 (77.5 %) of the study participants and two (1%) had growth in cervix (Fig. 1).

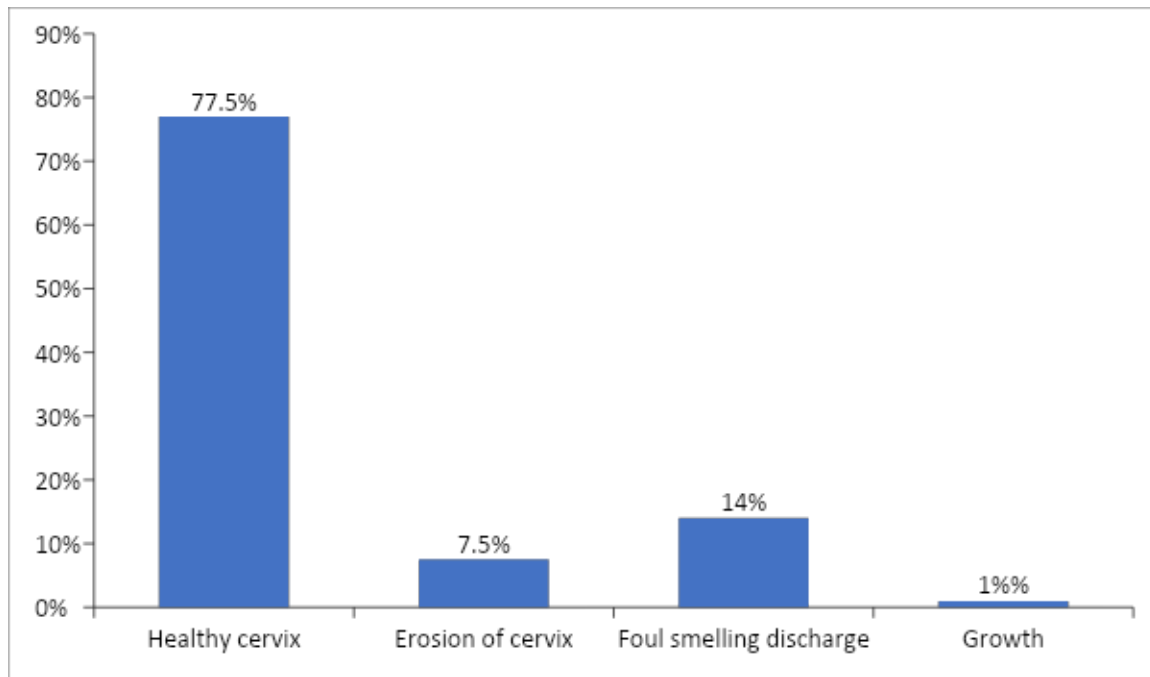


Fig. 1: Distribution of study participants based on the per speculum examination (N=200)

The PAP smear report revealed that 64 (32%) participants had inflammatory smear showing candidiasis and bacterial vaginosis with reactive inflammatory changes. One (0.5%) participant had LSIL. No satisfactory sample

was obtained in two (1%) of the participants (Table 1).

Table 1: Distribution of the study participants based on the PAP smear report (N=198)\*

Pap smear report	Frequency (%)
NILM	133 (66.5)
Inflammatory smear	64 (32)
LSIL	1 (0.5)

\*no satisfactory result was obtained in two samples.

In the age wise distribution of the study participants, it was seen that the majority of study participants, 69 (34.5%) were in the age group between 21 and 25 years with the minimum age of 17 years and maximum, of 40 years. The mean age was 25.3±5.2 years. In the parity wise distribution, it was seen that the majority of study participants, 139 (69.5%) were multigravida.

Majority of the study participants (n=68, 34%) at the time of presentation were between 21 and 25 weeks of gestation with the mean gestational age of 19.4±6.7 weeks. The minimum period of gestation at presentation was five weeks (Table 2).

Table 2: Distribution of the study participants based on their gestational age (N=200)

Gestational age (in weeks)	Frequency (%)
5-10	29 (14.5)
11-15	35 (17.5)
16-20	26 (13)
21-25	68 (34)
26-28	42 (21)

In this study, it was observed that the majority of the study participants (n=156, 78%) were not aware about PAP smear and only 44 (22%) knew about the procedure.

It was observed that the lower the age of marriage, the higher the chance of inflammatory change of cervix. Thirty (49.2%) participants had inflammatory smear who were married before 20 years. It was noticed that the incidence was gradually decreasing with women married later (Table 3).

Table 3: Distribution of the study participants based on their age at marriage and the PAP smear report (N=198)

PAP smear report	Age at marriage (years)				
	≤20 (n=61)	21-25 (n=41)	26-30 (n=47)	31-35 (n=48)*	>35 (n=3)*
NILM	30 (49.2%)	21 (51.2%)	35 (74.5%)	45 (93.7%)	2 (66.7%)
Inflammatory smear	30 (49.2%)	20 (48.8%)	12 (25.5%)	2 (4.2%)	0
LSIL	1 (1.6%)	0	0	0	0

\*One participant each had an unsatisfactory PAP smear report.

## DISCUSSION:

Cancer cervix falls in the category of preventable and easily diagnosable cancers. The available gold standard screening test to detect pre-invasive cervical lesions which are treatable is PAP smear. Such lesions if not diagnosed and treated in time may progress to carcinoma. Though a wide range of cancer cervix occurs in peri-menopausal age group, pre-malignant changes begin much earlier. That is why, current guidelines recommend PAP smear is to begin from the age of 21 years in all sexually active women and to be done every three years and HPV DNA co-testing every five years as screening method.[5] As pregnant women also fall under the same age group, PAP smear testing in pregnancy helps not only in identifying pre-malignant lesions of cervix but also in diagnosing asymptomatic genital infections which if left untreated might even hamper pregnancy outcome.[6] This study contained women from age group 16 to 39 years. Majority (34.5%) belonged to 21 to 25 years of age. Similar result was seen in the study conducted by Ethirajan S et.al in India.[3] Majority of the women in this study were multigravida (69.5%) while majority were primigravida in other studies.[3,5]

Regarding awareness about PAP smear, only 22% of women knew what it means and what it is used for, which is slightly better than the result of the study done in India.[3] However, this is in contrast to the study done by Manikkam B.[8] in Coimbatore where 80% of women and study done in Istanbul showed that 83.9% women were aware about PAP smear.[9] Better literacy rate and developed health care facilities might be the reasons for this.

Many females complain of pain in the lower abdomen on and off which is even severe at times. So, performing PAP smear at first antenatal visit to know the presence or absence of squamous intraepithelial lesion,

candidiasis, bacterial vaginosis and all of which infections may be of risk to mother and fetus. This initial smear can be used as a baseline diagnostic tool to treat infections if present.[10,11] In this study, maximum (34%) women presented for their first antenatal visit at 21 to 25 weeks of gestation. Though pregnancy does not hamper the false negative results rate, normal physiological changes occurring during pregnancy may result in difficult interpretation of PAP smear. For example, commonly seen mucus plug during pregnancy due to hyperplasia of cervical glands due to increased estrogen and progesterone associated with overall increase in vaginal secretions may obliterate the visualization of cervix.[12] In this study, there was no difficulty in visualizing the cervix of the involved women, and, maximum (77.5%) had healthy cervix similar to the study done by Priya S S et al.[2] Only 1% study participants showed growth which seemed benign. They were counseled for regular follow up and further evaluation later.

In the studies done in past, prevalence of abnormal cervical cytology varied from study to study.[2] Ueda Y et al. reported 3.68% in 2010 to 4.35% in 2013 in Japan, 4.8% was reported in 2018 in Thailand by Phaliwong P et al., 4.9% in 2019 in Italy by Martinelli M et al. and 16% in Africa in 2020 by Obeid DA et al.[13,14,15,16] The prevalence of abnormal PAP smear in pregnancy could be as high as 6-7% depending upon the population undergoing screening.[17] In present study, 0.5% of study population had LSIL which is almost similar to the study done by Manikkam B.[8] where 1% of women had pre-malignant lesion in PAP smear with 0.5% being ASCUS and Njaojaruwong et al.[15] with prevalence of abnormal cytology 0.4%. In contrast to the PAP report of present study, study done by Rasheed FA et al. in Nigeria, out of 161 pregnant women, six had ASCUS, 11 had LSIL and three had HSIL.[18] But liquid based cytology was used in that while

conventional PAP with Ayre's spatula was done in this study which might have led to this difference. In the present study, out of 30% of inflammatory smear, 4% were of bacterial vaginosis, 10% of candida infection while remaining were nonspecific inflammatory smears.

In LMICs like ours, where the awareness regarding PAP smear and its importance has just begun to rise, where still most of the population rely on insurance to do necessary investigations, screening during pregnancy has a huge role in identifying at risk cases. Identifying and treating at risk cases and infected cases, not only improves pregnancy outcome but also decreases the morbidity and mortality due to cancer cervix. It also serves as an excellent tool to educate and aware the female and her members encouraging them for regular PAP screening for themselves and community.

The study has a few limitations. As this study has small sample size and also only women up to 28 weeks of gestation are included, many cases might have been missed. Rather than conventional Pap smear, Liquid Based Cytology and HPV DNA are more sensitive but are not available here.

#### **CONCLUSION:**

Incidence of cancer cervix has been increasing every year and timely identification of pre malignant lesions could reduce this. In countries like ours, where many women do not undergo routine cervical screening, antenatal period during which women visit hospital, provides excellent opportunity to screen. As PAP smear is not only of diagnostic but therapeutic importance, community should be made aware about this and encouraged to test.

**Conflict of Interest:** The authors declare no competing interests exist.

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