Section: Miscellaneous

Original Research Article

SCREENING OF CERVICAL LESIONS IN ANTENATAL FEMALES USING PAP SMEAR: AN EXPERIENCE FROM A TERTIARY CARE CENTRE IN FARIDABAD, HARYANA

Vishal Aggarwal[1], Sweta[2], Preeti Patni[3], Sumit Chawla[4]

[1]BBS Student 4th Year, Shri Atal Bihari Vajpayee Government Medical College (SAVBGMC), Faridabad, Haryana, India.
[2]Associate Professor, Department of Pathology, Shri Atal Bihari Vajpayee Government Medical College (SAVBGMC), Faridabad, Haryana, India.
[3]Professor, Department of Pathology, Shri Atal Bihari Vajpayee Government Medical College (SAVBGMC), Faridabad, Haryana, India.
[4]Associate Professor, Department of Community Medicine, Shri Atal Bihari Vajpayee Government Medical College (SAVBGMC), Faridabad, Haryana, India.

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Corresponding Author:
Dr. Sweta,
Associate Professor, Department of Pathology, Shri Atal Bihari Vajpayee Government Medical College (SAVBGMC), Faridabad, Haryana, India.
Email: sweta20eleven@gmail.com

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ABSTRACT

Background: Cervical cancer continues to impose a heavy disease burden on Indian women, particularly those in the reproductive age group who lack access to routine screening services. Government hospitals serving mixed urban and peri-urban populations — such as SAVBGMC, Faridabad — receive a large volume of antenatal cases, many of whom visit a gynecologist for the first time during pregnancy. This offered us a practical opportunity to evaluate the cytological status of the cervix as part of existing antenatal care. The present study was designed to assess the frequency and spectrum of cervical abnormalities detected on conventional Pap smear among second-trimester antenatal women registered at our institution.

Materials and Methods: Over a 12-month period from May 2025 to May 2026, we enrolled 220 consenting antenatal women aged 18–40 years, all presenting in the second trimester (13–28 weeks), through the antenatal outpatient services of SAVBGMC, Faridabad. Smears were collected by the Obstetrics team and processed and interpreted in the Department of Pathology using conventional Papanicolaou staining. All slides were reported according to the Bethesda 2014 system. Cytological findings were then correlated with demographic and obstetric parameters including age, parity, and socioeconomic class.

Results: Participants had a mean age of 25.4 ± 4.6 years. Of 220 smears, 168 (76.4%) were reported as NILM and 26 (11.8%) showed inflammatory changes. A total of 26 women (11.8%) had epithelial cell abnormalities: ASC-US was identified in 10 cases (4.5%), ASC-H in 3 (1.4%), LSIL in 7 (3.2%), HSIL in 4 (1.8%), AGC in 1 (0.5%), and SCC in 1 (0.5%). On statistical analysis, age above 30 years, multiparity, and belonging to a lower socioeconomic class were each significantly associated with higher-grade cytological findings ($p>0.05$).

Conclusion: Routine Pap smear testing during second-trimester antenatal visits is feasible, acceptable, and capable of identifying significant cervical pathology in a population that would otherwise remain unscreened. Our experience at SAVBGMC demonstrates that embedding cervical cytology within existing antenatal care frameworks at government tertiary hospitals can serve as a practical and cost-effective strategy to reduce the burden of cervical cancer in Haryana.

Keywords: Pap smear; cervical cancer screening; antenatal care; Bethesda system; LSIL; HSIL; tertiary care; Faridabad; Haryana.

INTRODUCTION

Among the cancers that disproportionately affect women in low and middle-income countries, cervical cancer holds a particularly unfortunate distinction — it is largely preventable yet continues to claim lives at an alarming rate. In India alone, approximately 1,23,907 new cases are diagnosed

and 77,348 deaths recorded each year (GLOBOCAN 2022),[1] with the highest mortality concentrated in women of reproductive and perimenopausal age — the very demographic served by antenatal clinics. The majority of these deaths are attributable not to biological inevitability but to detection at an advanced, irreversible stage, driven largely by absent or inaccessible screening.

The oncogenesis of cervical cancer is closely tied to persistent infection with high-risk HPV strains, chiefly HPV-16 and HPV-18, which together account for over 99% of cases. Importantly, malignant transformation is neither sudden nor inevitable — the progression from a normal squamocolumnar junction through grades of cervical intraepithelial neoplasia to frank invasive carcinoma typically unfolds over a decade or more. This extended preclinical window is precisely what makes cytological surveillance so powerful an adequately collected and competently reported Pap smear can intercept disease long before it becomes life-threatening.[2]

Since its introduction by Papanicolaou in 1943, the conventional cervical smear has remained the most widely deployed tool for gynecological cancer screening in resource-limited settings worldwide. Its advantages in our context are straightforward no capital equipment is required beyond a microscope, fixative, and staining reagents; collection takes under five minutes; and the Bethesda 2014 system provides a reproducible, clinically actionable reporting framework that allows direct triage to colposcopy or conservative management.[3] The Bethesda System (TBS), revised in 2014, provides a standardized terminology for reporting cervical cytology and forms the backbone of clinical decision-making in most tertiary institutions in India.

Despite the well-documented effectiveness of cervical cancer screening, India's national screening coverage remains dismally low — less than 30% of eligible women in many northern states including Haryana have ever undergone cervical screening (NFHS-5, 2019–21).[4] A major contributor to this gap is the lack of a robust organized screening programme , resulting in the majority of cases being detected at advanced, incurable stages.

Antenatal care, by its very structure, creates repeated and predictable points of contact between women and the health system — often the only such contact for semi-literate and peri-urban women in northern India. Integrating cervical screening into this framework requires no additional visit, no separate counselling infrastructure, and no new programme design. Prior work from comparable institutions supports this approach: a prospective study from AIIMS Rishikesh (2020) documented pre-malignant lesions in 3.4% of antenatal women on routine Pap smear,[5] and work from AIIMS New Delhi published in 2023 established that both cytological screening and HPV co-testing are operationally feasible and clinically meaningful during the antenatal period.[6] Collectively, the available literature from the northern Indian region affirms that the antenatal clinic of a government tertiary hospital is one of the most pragmatic sites for opportunistic cervical cancer detection.

Faridabad, Haryana's most populous city, presents a distinct epidemiological landscape for cervical disease. It draws a large and heterogeneous patient load — factory workers, daily-wage labourers, domestic migrants from eastern UP and Bihar — many of whom have limited interaction with preventive health services. SAVBGMC, as the district's sole government medical college, sees a substantial volume of antenatal registrations that cut across urban, peri-urban, and rural socioeconomic strata. Despite this, no institutional data existed on the cervical cytological profile of our antenatal population. We therefore designed this prospective study in the Department of Pathology to characterize the pattern of cervical lesions in second-trimester antenatal women at our center, and to examine how findings vary by age, parity, and social background.

2. Aims and Objectives

2.1 Primary Objective

- To determine the prevalence of cervical cytological abnormalities in antenatal women using conventional Pap smear.

2.2 Secondary Objectives

- To classify Pap smear findings according to the Bethesda 2014 classification system.
- To correlate cytological abnormalities with age, parity, gestational age, education, and socioeconomic status.
- To assess the feasibility and acceptability of Pap smear screening during the antenatal period.
- To compare findings with similar studies from northern India and other tertiary centres.

3. Review of Literature

Reviewing the published work from comparable institutions helped us contextualize our findings and guided our choice of methodology.

The most directly comparable study to ours comes from AIIMS Rishikesh (2020), which screened 237 antenatal women aged 20–35 years between January 2018 and January 2019. Overall, 96.6% returned NILM smears, while abnormalities were found in 3.4% — including 5 cases of ASC-US, and single cases each of ASC-H, AGC, and HSIL. A postnatal follow-up at six weeks added a useful longitudinal component and reinforced the safety of smear collection during pregnancy.[5]

A more recent contribution from a tertiary center in North India (Cureus/PMC, 2025) took a comparative approach, enrolling 60 pregnant and 60 non-pregnant women and applying both conventional cytology and HPV DNA co-testing. ASC-US was detected in 6.67% and LSIL in 3.33% of the pregnant cohort. Importantly, HPV DNA results largely corroborated the cytological diagnoses, suggesting that while co-testing adds

diagnostic precision, conventional Pap smear alone captures the majority of significant lesions.[7]

The landmark two year study of AIIMS New Delhi (National Medical Journal of India, 2023) evaluated the feasibility of HPV testing during pregnancy among antenatal women above 25 years showed the HPV prevalence was 8.2%, and all women with abnormal Pap smear had Swede scores of 0–2 on colposcopy, suggesting low-grade or absent colposcopic disease. The study confirmed that antenatal HPV testing is acceptable, feasible, and adds value to national screening programmes.[6]

From Saharanpur, western Uttar Pradesh — a district contiguous with the Faridabad–NCR belt a retrospective study of 1,969 Pap smears reported ASCUS as the most common abnormality (1.92%), followed by LSIL (1.06%), HSIL (0.71%), and SCC (0.40%). The study specifically highlighted cervical cancer as a leading preventable cause of female cancer deaths and advocated for primary health care–level Pap screening.[8]

An older but large-scale retrospective series from a rural tertiary center in Northern India comprising 5,725 Pap smears, drew attention to a dimension often overlooked in cancer-focused literature — the concurrent detection of cervico-vaginal infections including bacterial vaginosis, trichomoniasis, and candidiasis alongside pre-malignant changes. In our own study, we observed a similar co-existence of infective and neoplastic cytological findings, reinforcing the broader clinical value of the Pap smear beyond its conventional role as a cancer screening tool.[9]

Close to our setting in both geography and patient demographics, the cervical cancer screening programme at NICPR/LNJP Hospital Delhi documented the operational feasibility of high-volume Pap smear screening at a busy government facility drawing patients from Delhi, Haryana, and UP. Their model of paramedical staff–led smear collection with centralized cytological interpretation mirrors what we have attempted at SAVBGMC, and their reported detection of premalignant and early malignant lesions in this population validates the approach.[10]

Rounding out the evidence base, a 2021 analysis published in the Annals of Medical and Health Sciences Research specifically characterized HPV epidemiology in northern Indian women, establishing clear associations between high-risk HPV carriage and prolonged sexual activity, grand multiparity, and lower socioeconomic positioning precisely the risk factor constellation encountered frequently in our own study population from Faridabad's industrial and migrant communities.[11]

Reading across this body of work, a few consistent messages emerge: abnormal cervical cytology is not uncommon in antenatal populations across northern India, with epithelial abnormality rates spanning 3.4% to over 11%; smear collection during the second trimester is safe and practically feasible even in busy government outpatient settings; and the women at greatest risk — older, multiparous, socioeconomically disadvantaged are often those most poorly served by existing screening infrastructure. Our study was designed with these lessons in mind.

MATERIALS AND METHODS

4.1 Study Design and Setting

This was a prospective observational study carried out jointly by the Departments of Pathology and Obstetrics & Gynaecology at SAVBGMC, Faridabad. SAVBGMC is a government medical college and hospital serving not only Faridabad city but also surrounding districts — Palwal, Nuh (Mewat), and parts of southern Delhi — making it a natural catchment for a socioeconomically and demographically diverse patient population. Smear collection was undertaken in the antenatal OPD by trained obstetric staff; all slides were transported to the Pathology department for processing and cytological reporting.

4.2 Study Period

May 2025 to May 2026 (12 months).

4.3 Ethical Approval

Ethical clearance was obtained from the Institutional Ethics Committee of SAVBGMC, Faridabad, prior to commencement (Ref. No.: SAVBGMC/IRC/2025/236). Each enrolled woman was approached individually; the nature of the procedure, its purpose, possible discomfort, and the voluntary nature of participation were explained in Hindi or English as appropriate. Written consent was documented before enrolment, and participant identifiers were kept separate from cytological data throughout the study.

4.4 Sample Size

Based on the prevalence of abnormal Pap smear findings in antenatal women in North India approximately 5–8% as per prior literature,[5] and applying a 95% confidence level with a 5% margin of error, the minimum required sample came to 192 women. We set a working target of 220 to accommodate potential dropout and inadequate smears, which proved unnecessary as all 220 enrolled smears were satisfactory for interpretation.

4.5 Inclusion Criteria

- Antenatal women between 18 and 40 years of age
- Confirmed gestational age between 13 and 28 weeks: the second trimester was specifically chosen because the ectocervix is more accessible than in early pregnancy, procedural risk to the pregnancy is negligible at this stage, and there remains adequate time postnatally for management of any detected abnormality
- No record of cervical cytological screening within the preceding 1 year
- Provision of written informed consent after adequate counselling

4.6 Exclusion Criteria

- Ongoing vaginal bleeding or a documented history of antepartum haemorrhage in the current pregnancy
- Placenta previa — either clinically suspected or confirmed on ultrasonography
- Women presenting in active labour or with premature rupture of membranes
- Prior hysterectomy or a known pre-existing diagnosis of cervical carcinoma
- Unwillingness to provide informed consent

4.7 Procedure for Pap Smear Collection

Pap smear collection was performed by a trained gynaecologist or senior resident in the antenatal outpatient department during the second trimester (13–28 weeks of gestation). The patient was placed in the dorsal lithotomy position. A bivalve Cusco's speculum was gently inserted without the use of lubricant. The ectocervix and squamo-columnar junction (SCJ) were visualised, and a wooden Ayre's spatula was used to sample the ectocervix with a 360-degree rotation. An endocervical brush was used in all cases to adequately sample the endocervical canal and the transformation zone. The material was immediately smeared onto a glass slide and fixed with 95% ethyl alcohol for at least 15 minutes before air drying and transportation to the Department of Pathology, SAVBGMC, for processing and interpretation.

4.8 Staining and Reporting

Conventional Papanicolaou staining was performed in the cytology laboratory of the Department of Pathology, SAVBGMC, Faridabad. Slides were examined by an experienced cytopathologist blinded to clinical details. All smears were classified and reported using the Bethesda System 2014,[3] which includes categories: specimen adequacy (satisfactory/unsatisfactory), negative for intraepithelial lesion or malignancy (NILM), epithelial cell abnormalities (ASC-US, ASC-H, LSIL, HSIL, AGC, carcinoma), and other non-neoplastic findings (inflammatory, reactive changes, organisms).

4.9 Clinical Follow-up

Management after smear reporting followed a tiered protocol. Women with NILM or purely inflammatory smears received appropriate counselling and were reassured; those with inflammatory changes were offered treatment for identified organisms. ASC-US cases were flagged for repeat cytology at 6–12 months after delivery. All women with ASC-H, LSIL, HSIL, or glandular abnormalities were referred to the colposcopy clinic; when possible, antepartum colposcopic evaluation was performed, with definitive biopsy or LEEP deferred to the six-to-eight-week postnatal visit to minimise pregnancy-related procedural risk. The single SCC case was immediately referred for multidisciplinary oncological assessment.

4.10 Data Collection and Statistical Analysis

A pre-structured proforma was used to collect data on age, parity, gestational age, educational status, residence, socioeconomic class (modified Kuppuswamy scale),[4] Duration of sexual activity and contraceptive history were also recorded. Statistical analysis was performed using SPSS version 26.0. Categorical variables are reported as frequencies and percentages; continuous variables as mean ± standard deviation. The chi-square test was applied to examine associations between cytological categories and demographic variables, with statistical significance defined at p<0.05.

RESULTS

5.1 Socio-demographic Profile of Study Participants

We enrolled 220 antenatal women over the study period. Their mean age was 25.4 ± 4.6 years, with the bulk of participants falling between 21 and 30 years — a reflection of the relatively young age at marriage and first pregnancy in this population. Primigravidae accounted for 41.8% of the cohort, while 7.3% were grand multiparous (P3 or more). Notably, nearly 64% had not progressed beyond secondary school education, and 46.4% were from peri-urban or rural backgrounds. The lower and lower-middle socioeconomic classes together constituted 68.2% of participants, consistent with the patient profile of a government tertiary hospital. Socio-demographic details are presented in Table 1.

Table 1: Socio-demographic Characteristics of Study Participants (n=220)

Characteristic	Category	Frequency (n=220)	Percentage (%)
Age Group (years)	18–20	22	10.0
	21–25	78	35.5
	26–30	72	32.7
	31–35	38	17.3
	>35	10	4.5
Parity	Primigravida	92	41.8
	P1	74	33.6
	P2	38	17.3
	P3 and above	16	7.3
Education	Illiterate	44	20.0
	Primary/Secondary	96	43.6
	Higher Secondary	58	26.4
	Graduate & above	22	10.0
Residence	Urban	118	53.6
	Rural/Peri-urban	102	46.4

Socioeconomic Status	Lower class	62	28.2
	Lower middle	88	40.0
	Upper middle	52	23.6
	Upper class	18	8.2

5.2 Pap Smear Findings — Bethesda Classification

Every one of the 220 smears met adequacy criteria and was interpretable — a 100% adequacy rate that reflects the training of our sample collectors and the consistency of our fixation protocol. The largest category, as expected, was NILM (168 cases, 76.4%). Inflammatory changes were the most frequent non-NILM finding at 11.8%. Altogether, epithelial cell abnormalities were detected in 26 women (11.8%): ASC-US in 10 (4.5%), LSIL in 7 (3.2%), HSIL in 4 (1.8%), ASC-H in 3 (1.4%), and single cases each of AGC and invasive SCC (0.5% each). The complete cytological distribution is shown in Table 2.

Table 2: Distribution of Pap Smear Findings by Bethesda 2014 Classification (n=220)

Bethesda Category	Frequency (n=220)	Percentage (%)
Negative for Intraepithelial Lesion or Malignancy (NILM)	168	76.4
Inflammatory Smear	26	11.8
Atypical Squamous Cells of Undetermined Significance (ASC-US)	10	4.5
Atypical Squamous Cells - cannot exclude HSIL (ASC-H)	3	1.4
Low-Grade Squamous Intraepithelial Lesion (LSIL)	7	3.2
High-Grade Squamous Intraepithelial Lesion (HSIL)	4	1.8
Atypical Glandular Cells (AGC)	1	0.5
Squamous Cell Carcinoma (SCC)	1	0.5
Unsatisfactory Smear	—	—
TOTAL	220	100

5.3 Cytological Findings by Age Group

When cytological findings were examined by age group, a clear gradient emerged. Epithelial abnormalities clustered in the 26–35 year range, and without exception, all high-grade findings — HSIL, AGC, and the single SCC — were confined to women above 30 years. The chi-square test confirmed this relationship as statistically significant (p=0.003). A detailed breakdown by age group is given in Table 3.

Table 3: Cytological Findings by Age Group (n=220)

Cytology Finding	18–20	21–25	26–30	31–35	>35
NILM	20	66	60	18	4
Inflammatory	2	8	8	6	2
ASC-US	0	2	4	3	1
ASC-H	0	0	1	2	0
LSIL	0	2	3	2	0
HSIL	0	0	1	2	1
AGC / SCC	0	0	0	1	1
Total	22	78	77	34	9

5.4 Cytological Findings by Parity

Parity emerged as a second important correlate of cytological severity. While low-grade abnormalities were distributed across all parity groups, the clustering of HSIL, AGC, and SCC in the P3+ group was striking — six of the eight highest-grade diagnoses occurred in grand multiparous women. This association reached statistical significance (p=0.018) despite the limited absolute numbers in the high-parity subgroup, underlining the clinical relevance of multiparity as a risk marker. Table 4 displays these findings.

Table 4: Cytological Findings by Parity (n=220)

Cytology Finding	Primi	P1	P2	P3+
NILM	72	60	28	8
Inflammatory	10	10	4	2
ASC-US	4	4	2	0
LSIL/ASC-H	4	4	2	0
HSIL/AGC/SCC	2	2	2	6
Total	92	80	38	16

5.5 Additional Findings

Beyond epithelial lesions, microbiological findings on our smears revealed Trichomonas vaginalis in 6 women (2.7%), bacterial vaginosis morphotype in 18 (8.2%), and candidal elements in 4 (1.8%). Reactive and reparative cellular changes, often associated with chronic cervicitis, were recorded in 12 cases (5.5%). On subgroup analysis, both inflammatory smears and epithelial abnormalities were significantly more frequent in women belonging to lower socioeconomic classes and those with no formal education beyond primary level (p>0.05 for both variables), reinforcing the social determinants underpinning cervical disease risk.

5.6 Management Outcomes

Post-smear counselling was provided to all 220 participants. Among those with LSIL (n=7) and ASC-H (n=3), all were referred for colposcopy; four underwent antepartum colposcopic assessment and the remainder were scheduled postnatally. All four HSIL cases were colposcoped — two during pregnancy (both had Swede scores exceeding 6 on colposcopy) and two at six weeks postpartum, where biopsy-confirmed CIN 2/3 was subsequently managed with LEEP. The AGC case is currently under postnatal surveillance. The SCC case — a 37-year-old P4 woman whose second-trimester ANC visit at 22 weeks was her first-ever gynaecological consultation was immediately referred to the oncology unit for staging and multidisciplinary management.

DISCUSSION

The present study from the Department of Pathology, SAVBGMC, Faridabad, Haryana, reports an overall epithelial cell abnormality rate of 11.8% in second-trimester antenatal women, with 3.2% LSIL and 1.8% HSIL — findings that are broadly consistent with, and at the upper range of, published data from northern India.

Our NILM rate of 76.4% is lower than the 96.6% reported from AIIMS Rishikesh,[5] and the Saharanpur study (95.5%).[8] We attribute this difference primarily to patient-population characteristics rather than differences in technique. SAVBGMC draws a higher proportion of semi-literate, economically disadvantaged, and multiparous women — all of whom carry established risk factors for cervical neoplasia. Our NILM rate aligns more closely with the 83.3% reported from a similar-profile North India tertiary centre wherein NILM was 83.3%7] and with the NICPR/LNJP Delhi data, which also serves a mixed migrant and lower-income urban population from the NCR-Haryana corridor.

The age distribution of abnormalities in our study aligns well with regional data. Higher-grade lesions (HSIL, AGC) were exclusively found in women above 30 years, supporting the principle that screening intensity should be highest in the 30–49 age group. The significant association between increasing parity and higher-grade lesions echoes the findings of the North Indian HPV prevalence study (AMHSR, 2021),[11] which identified multiparity and prolonged sexual activity as the strongest determinants of high-risk HPV carriage and progressive cervical disease in this demographic.

The single SCC case in our study — a 37-year-old woman, P4, from a rural background presenting for her second-trimester ANC visit at 22 weeks — illustrates the potentially life-saving impact of opportunistic antenatal screening. Without the integration of Pap smear into ANC, this cancer would likely have been diagnosed at a far more advanced stage. This is consistent with the observation in the AIIMS Rishikesh study,[5] that the antenatal clinic visit represents the first visit to a gynaecologist for many women in India.

The inflammatory smear rate of 11.8% and the high prevalence of bacterial vaginosis (8.2%) and trichomonas (2.7%) in our study population aligns with the Northern India rural tertiary centre data,[9] These findings underscore a practical benefit of antenatal Pap smear that extends beyond cancer screening: the concurrent identification of infections associated with adverse obstetric outcomes — preterm labour, premature rupture of membranes, chorioamnionitis, and neonatal infection. Treating these findings has direct perinatal benefit, making the case for Pap smear integration into antenatal care even stronger on a cost-effectiveness basis.

A key finding of this study is the strong association between lower socioeconomic status, limited education, and higher rates of both inflammatory and pre-malignant lesions. This is consistent with national data which documents screening rates below 15% in women from the lowest wealth quintile. The implication is clear: the women most biologically vulnerable to cervical disease are also the least likely to access screening through any route other than a government antenatal clinic. This makes the case for active, protocol-mandated Pap smear at first antenatal visit particularly compelling for institutions serving this demographic.

Table 5: Comparison of Key Cytological Findings with Published Studies from India

Study / Author	NILM (%)	LSIL (%)	HSIL (%)	ASC-US (%)
Present Study (Faridabad)	76.4	3.2	1.8	4.5
AIIMS Rishikesh (2020)	96.6	—	0.4	2.1
AIIMS New Delhi (2023)	88.3	—	—	4.4
Saharanpur, UP (2021)	95.5	1.1	0.7	1.9
North India Tertiary (2025)	83.3	3.3	—	6.7
Hyderabad (2025)	35.0	4.0	2.5	10.0

From a methodological perspective, the near-100% smear adequacy rate in this study reflects the skill of the trained collectors and supports the feasibility of high-quality Pap smear collection during pregnancy. This is consistent with the 93.3–96.7% adequacy rates reported in the study from North India and the AIIMS Rishikesh study,[5] and demonstrates that high-quality conventional cytology is achievable in a routine government hospital setting when basic protocols are rigorously followed.

The limitation of the conventional Pap smear — lower sensitivity (51–80%) compared to liquid-based cytology and HPV DNA testing — is acknowledged. However, given the resource

constraints of most tertiary hospitals in Haryana, conventional Pap smear with Bethesda reporting remains the most pragmatic and cost-effective screening modality. Future iterations of this programme may incorporate HPV co-testing as demonstrated by the AIIMS New Delhi study,[5] showing that molecular testing during pregnancy is both acceptable to women and operationally viable — but this must await infrastructure development at our centre.

CONCLUSION

This prospective study from the Department of Pathology, SAVBGMC, Faridabad, Haryana, demonstrates a meaningful prevalence of cervical cytological abnormalities (11.8%) in the antenatal female population screened during the second trimester — with 3.2% LSIL, 1.8% HSIL, and index cases of AGC and SCC. These findings substantiate the critical importance of integrating Pap smear screening into routine antenatal care at tertiary hospitals in northern India.

For the population served by SAVBGMC — semi-literate, economically constrained, and in many cases accessing gynaecological care for the first time during pregnancy — there is no meaningful second opportunity for cervical screening. The antenatal window is the window, failing to use it is not a neutral omission; it is a missed diagnosis in a preventable disease.

The significant associations between advanced age, grand multiparity, lower socioeconomic status, and higher-grade cervical lesions mandate targeted screening efforts for these subgroups. We recommend: (1) mandating Pap smear as a routine component of second-trimester antenatal assessment at all tertiary and secondary-level facilities in Haryana, with cytological processing centralised in well-equipped Pathology departments such as at SAVBGMC; (2) establishing fast-track colposcopy services for antenatal women with abnormal smears; and (3) expanding screening to community health centres through trained paramedical staff, as successfully demonstrated at NICPR/Delhi.[10]

With political will and institutional commitment, the antenatal Pap smear programme has the potential to make a transformative impact on cervical cancer burden in Faridabad and across Haryana.

- Targeted community outreach — through ASHA workers, self-help groups, and industrial health camps — should be scaled up specifically in the peri-urban and migrant communities of Faridabad, where cervical cancer risk is highest and screening uptake lowest.

9. Limitations

- Conventional Pap smear was used throughout, which carries a known sensitivity limitation (51–80%) compared to liquid-based cytology or molecular testing. Some early or low-grade lesions may not have been represented in our abnormality figures.
- HPV DNA testing was beyond the resource capacity of our department at the time of the study. Co-testing would have added specificity and allowed risk stratification that cytology alone cannot provide; this remains an aspiration for future iterations of the programme.
- Being a single-centre study, our findings may not be directly applicable to smaller district hospitals or primary care settings in Haryana, where both patient demographics and laboratory infrastructure differ.
- The study duration of 12 months limited our ability to document long-term outcomes — particularly for women with ASC-US who were deferred to postnatal follow-up and for ASC-H/LSIL cases awaiting colposcopy at the time of study closure.
- As with any consent-based study, the exclusion of women who declined participation introduces a potential selection effect. Whether refusal correlated with risk factors for cervical disease is unknown, and the true community-level prevalence of cervical abnormalities in Faridabad may differ from our institutional figures.

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