

Cervical Cancer Screening Outcomes Using Smart Scope Among Rural Women in Pune District, India : A Cross-Sectional Study with Multivariable Risk Modelling

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Article

Keywords: Cervical cancer screening, Smart Scope, cervical erosion, logistic regression, rural health, India

Posted Date: August 7th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-10502488/v1>

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Additional Declarations: No competing interests reported.

Abstract

Background

Cervical cancer remains the second most common cancer among women in India. Screening programmes are effective, but implementation in resource-limited rural settings is hindered by infrastructure, workforce and follow-up constraints.

Methods

A retrospective cross-sectional study screened 1,747 rural women above 18 years of age at rural field practice area of private medical college, Pune, from January 2023 to December 2025. Data of cervical cancer screening were collected using Smart scope. High resolution cervical images were captured by trained medical officer and interpreted by gynecologist. Mean age differences across pathology groups were assessed with one-way ANOVA and Bonferroni-adjusted pairwise comparisons. Linear trend in erosion prevalence across age groups was tested using the Cochran–Armitage test and a fitted linear regression trend line. A multivariable binary logistic regression model was fitted for cervical erosion. Model discrimination was assessed by the area under the receiver operating characteristic curve (AUC) and calibration by the Hosmer–Lemeshow test.

Results

Of 1,747 women screened, 61.1% had a healthy cervix, 35.7% had cervical erosion, 2.6% had a cervical polyp and 0.6% had a mixed infection. Age was significantly associated with screening outcome ($\chi^2 = 64.23$, $df = 6$, $p < 0.001$), and erosion prevalence declined near-linearly from 47% in women aged 20–24 years to under 20% in those aged ≥ 65 years (Cochran–Armitage trend $Z = -6.73$, $p < 0.001$; linear trend $p < 0.001$). Mean age differed significantly across pathology groups (ANOVA $F = 21.19$, $p < 0.001$); women with polyps were oldest (44.72 ± 9.08 years) and those with mixed infection were youngest (34.91 ± 8.46 years). On multivariable logistic regression ($n = 1,676$; full symptom model), younger age (adjusted OR [AOR] = 0.97 per year, 95% CI 0.96–0.98), backache (AOR = 1.51, 95% CI 1.19–1.91), white discharge (AOR = 1.45, 95% CI 1.15–1.85) and later age at menarche (AOR = 1.08 per year, 95% CI 1.01–1.16) were independently associated with cervical erosion (model AUC = 0.648; Hosmer–Lemeshow $p = 0.24$, indicating adequate fit).

Conclusion

Smart Scope-assisted screening identified a substantial burden of cervical pathology among rural women, with age and specific symptoms independently predicting cervical erosion. Symptom-triggered and age-stratified screening, supported by portable digital imaging and telemedicine, may strengthen early detection in resource-limited rural settings.

Background

Cervical cancer remains a major public health challenge for women around the world, with an estimated 660,000 new cases and 350,000 deaths worldwide in 2022[1]. The burden of disease is highest in low- and middle-income

countries, where nearly 94% of cervical cancer deaths occur. In India, cervical cancer is the second most common cancer among women and the third leading cause of cancer-related deaths, with approximately 5.0% of the female population infected with cervical HPV-16/18 at any point in time [1]. This high burden persists despite the availability of effective screening technologies and preventive measures. The majority of cervical cancer cases are caused by infection with subtypes of human papilloma virus (HPV), which mainly affects women over 30 years old, with a peak incidence in 45 to 50 years old. [2]. According to the National Family Health Survey (NFHS-5) report (2019–2021), cervical cancer screening in India is critically low, with only 0.9% to 1.9% of women aged 30–49 ever undergoing a screening test [3]. Though cytology is still considered as the gold standard for cervical cancer screening visual inspection with acetic acid (VIA) and pap smear test (Papanicolaou Test) are also effective screening methods for cervical cancer and less costly than cytology [4]. One of the limitations of cytology-assisted screening is the low sensitivity for the detection of precursor lesions (cervical intraepithelial neoplasm [CIN2+] grade 2 or higher) compared to HPV & pap smear testing [5]. In India, in rural areas, the use of pap smears is complicated by several factors like high costs, difficulty in preserving cell samples and transporting slides, lack of trained lab technicians to analyze the results and difficulties in getting women back for follow-up tests and for treatment and referral, when necessary [6]. Recognizing these barriers, the World Health Organization has recommended visual inspection with acetic acid (VIA) and Lugol's iodine (VILI) for resource-limited settings, and India adopted VIA-based community screening guidelines in 2005 with current policy recommending VIA for all women above 30 years [7, 8]. Despite acceptable pooled accuracy (VIA sensitivity 67–79%, specificity 49–86%; VILI sensitivity 77.8–98%, specificity 73–91.3%), visual methods remain highly subjective, lack permanent documentation, show low inter-observer reproducibility and risk overtreatment [9]. To overcome these challenges a digital device, Smart Scope (SS), was manufactured by Periwinkle Technologies Pvt. Ltd., India. The Smart Scope aided VIA test was compared with naked eye VIA and Pap smear screening tests by a team of pathologists and gynecologists at a tertiary care center in Pune, India. The sensitivity and specificity documented by smart scope test was 100% and 36.8% respectively [10].

Smart Scope® is portable, intravaginal digital cervical imaging device with an 18 cm stainless-steel probe (12 mm diameter), integrated light source and camera at 5× magnification, wirelessly linked to tablet-based Net4Medix software for image capture, storage and telemedicine transmission [11]. Field-based colposcopy triage models elsewhere in rural India similarly show that bringing imaging closer to the beneficiary substantially improves attendance for confirmatory evaluation [12].

While Smart Scope has been deployed across tertiary and rural health training centers in India, comprehensive published evidence on its screening yield, and on the factors that predict abnormal findings, remains limited. Understanding which women are most likely to present with cervical pathology by age and by symptom profile is essential to prioritize screening resources and referral pathways in resource-constrained rural programmes. Hence the present study was conducted with the objective to estimate the proportion of cervical pathologies and to identify independent predictors of cervical erosion using multivariable analysis among rural women in Pune district screened using Smart Scope.

Methods

Study Design and Setting

A cross-sectional study was conducted at the Rural Health Training Centre (RHTC) field practice area of a private medical college in Pune, Maharashtra, India. The study period spanned from January 2023 to December 2025.

Women attending the RHTC and field health camps during this period were enrolled in the study.

Inclusion criteria

Sexually active women of reproductive, perimenopausal and postmenopausal age (above 18 years of age) attending the RHTC or field camps during the study period.

Exclusion criteria

Pregnant women, women with a prior history of cervical cancer, and those who had undergone hysterectomy were excluded.

Sample Size

The sample size was estimated from an anticipated prevalence of healthy cervix of 53.6% ($p = 0.536$); with 2.5% absolute precision ($d = 0.025$) and 95% confidence ($Z = 1.96$), the calculated minimum sample size was approximately 1,529 women. The final analyzed sample ($n = 1,747$) exceeds this requirement.

Ethics approval:

Institutional Ethics committee approval was taken (BVDUMC/IEC/391/25–26). The requirement for informed consent was waived by the Institutional Ethics Committee of BVDUMC. All authors confirmed that the study was conducted in accordance with the relevant ethical guidelines and regulations, including the Declaration of Helsinki where applicable.

Data Collection

Women were counselled prior to screening test and informed consent was obtained from all participants. Data were collected using a pretested structured questionnaire covering sociodemographic profile, menstrual and obstetric history, presenting reproductive complaints and family history, together with Smart Scope cervical imaging. High-resolution cervical images were captured by a trained female medical officer under aseptic conditions and evaluated by a qualified gynecologist via a cloud-based telemedicine link. If any pathology or pre-cancerous lesions or cancer was suspected by the gynecologist, then the participants were referred for further investigations.

Statistical Analysis

Data were analyzed using SPSS version 29 for descriptive statistics and R 4.6.1 version for advanced multivariable and diagnostic analyses. Categorical variables are presented as frequencies and percentages; continuous variables as mean $\pm$ standard deviation. Associations between categorical variables were tested using the Pearson chi-square test without continuity (Yates') correction, including for 2 $\times$ 2 tables. The Cochran–Armitage test was used to assess linear trend in erosion prevalence across ordered age groups. Differences in mean age across the four pathology categories were assessed by one-way ANOVA, with pairwise comparisons adjusted using the Bonferroni correction. Free-text parity and tubal ligation entries were categorized by two independent reviewers into standardized groups prior to analysis. A multivariable binary logistic regression model was fitted for cervical erosion (present vs absent) with age, presenting symptoms (backache, white discharge, pain abdomen), parity status, age at marriage, age at menarche, family history and tubal ligation status as covariates; results are

reported as adjusted odds ratios (AOR) with 95% confidence intervals. Model calibration was evaluated using the Hosmer–Lemeshow goodness-of-fit test and discrimination using the area under the receiver operating characteristic curve (AUC). A two-sided p-value < 0.05 was considered statistically significant throughout.

Results

A total of 1,747 rural women above 18 years of age underwent Smart Scope cervical screening. The mean age of the study population was 39.7 ± 9.9 years.

Table 1. Distribution of study participants by age group (N=1,747)

Age group (years)	Frequency (n)	Percentage (%)
20–39	935	53.5
40–59	716	41.0
≥60	96	5.5
Total	1747	100.0

More than half of the participants (53.5%) were aged 20–39 years, followed by 41.0% aged 40–59 years; only 5.5% were aged 60 years and above, reflecting a predominantly reproductive-age screened population. (Table 1)

Table 2. Association between age group and cervical screening outcome

Age group (years)	Cervical erosion n (%)	Healthy cervix n (%)	Mixed infection n (%)	Polyp n (%)	Total n (%)
20–39	404 (43.2)	514 (55.0)	7 (0.7)	10 (1.1)	935 (100.0)
40–59	195 (27.2)	485 (67.7)	4 (0.6)	32 (4.5)	716 (100.0)
≥60	24 (25.0)	68 (70.8)	0 (0.0)	4 (4.2)	96 (100.0)
Total	623 (35.7)	1067 (61.1)	11 (0.6)	46 (2.6)	1747 (100.0)

Pearson $\chi^2 = 64.23$, df = 6, $p < 0.001$ (no continuity correction applied). Cochran–Armitage trend test for erosion across ordered age groups: $Z = -6.73$, $p < 0.001$.

Age group showed a statistically significant association with cervical screening outcome. Cervical erosion (Fig 1) was most frequent in women aged 20–39 years (43.2%) and declined progressively with advancing age, while the proportion of healthy cervix (Fig 2) rose from 55.0% in the youngest group to 70.8% in women aged ≥60 years. Mixed infections (Fig 3) were present mostly below 60 years of age. Cervical polyps were proportionally more common in older women. This declining trend in erosion prevalence with age is examined further in Figure 1, which presents prevalence by age group as bars with a trend line connecting the successive prevalence values. (Table 2)

Prevalence of cervical erosion declined from 50.0% in women aged 20–29 years to 22.3% in women aged 50–59 years, with a small uptick to 25.0% in the smallest, oldest stratum (≥60 years, n=96). The overlaid trend line,

connecting the observed prevalence at each age group, closely tracked this decline, and both the Cochran–Armitage trend test (computed on individual-level data) and the linear regression slope across age groups confirmed a statistically significant declining trend ($p < 0.001$ and $p = 0.031$ respectively). (Fig 4)

Table 3. Mean age distribution according to cervical screening outcome

Cervical outcome	Frequency (n)	Percentage (%)	Mean age (years)	SD
Mixed infection	11	0.6	34.91	8.46
Cervical erosion	623	35.7	37.46	9.04
Healthy cervix	1067	61.1	40.90	10.20
Polyp	46	2.6	44.72	9.08
Total	1747	100.0	39.73	9.93

(One-way ANOVA: $F = 21.19$, $p < 0.001$)

The mean age of women with cervical polyps was significantly higher than in the other three groups, whereas women with mixed infection and cervical erosion were, on average, younger.(Table 3)

Table 4. Bonferroni-Adjusted pairwise comparison of mean age between cervical screening outcomes

Comparison	Mean difference (years)	Bonferroni-adjusted p-value
Cervical erosion vs Healthy cervix	-3.44	<0.001
Cervical erosion vs Mixed infection	2.55	1.000
Cervical erosion vs Polyp	-7.26	<0.001
Healthy cervix vs Mixed infection	5.99	0.247
Healthy cervix vs Polyp	-3.82	0.046
Mixed infection vs Polyp	-9.81	0.022

Six pairwise comparisons across the four pathology groups were tested, with the significance threshold adjusted to $\alpha = 0.0083$ ($0.05/6$). Women with cervical erosion were significantly younger than those with a healthy cervix or with polyps; women with polyps were significantly older than those with a healthy cervix or mixed infections. (Table 4)

Table 5. Overall cervical cancer screening outcomes among study participants

Screening outcome	Frequency (n)	Percentage (%)
Healthy cervix	1067	61.1
Cervical erosion	623	35.7
Polyp	46	2.6
Mixed infection	11	0.6
Total	1747	100.0

The majority of women screened (61.1%) had a healthy cervix. Cervical erosion was detected in over a third of participants (35.7%), while mixed infection and cervical polyps were comparatively uncommon. (Table 5)

Table 6. Distribution of participants according to presenting symptoms and cervical erosion

Symptom	Category	Erosion present n(%)	Erosion absent n (%)	Total (n)	Pearson χ^2	χ^2 p- value	Crude OR (95% CI)	Adjusted OR (95% CI)	Adj. p- value
Pain in abdomen	Present	105 (42.5)	142 (57.5)	247	5.88	0.015	1.40 (1.07– 1.84)	1.17 (0.87– 1.57)	0.289
	Absent	518 (34.5)	982 (65.5)	1500			(ref.)	(ref.)	
Backache	Present	212 (46.3)	246 (53.7)	458	30.55	<0.001	1.84 (1.48– 2.29)	1.51 (1.19– 1.91)	<0.001
	Absent	411 (31.9)	878 (68.1)	1289			(ref.)	(ref.)	
White discharge	Present	309 (45.2)	374 (54.8)	683	44.86	<0.001	1.97 (1.62– 2.41)	1.45 (1.15– 1.85)	0.002
	Absent	314 (29.5)	750 (70.5)	1064			(ref.)	(ref.)	
Itching valva	Present	141 (38.8)	222 (61.2)	363	2.02	0.155	1.19 (0.94– 1.51)	0.99 (0.75– 1.29)	0.922
	Absent	482 (34.8)	902 (65.2)	1384			(ref.)	(ref.)	
Heavy menses	Present	41 (37.6)	68 (62.4)	109	0.19	0.660	1.09 (0.73– 1.63)	1.09 (0.72– 1.67)	0.681
	Absent	582 (35.5)	1056 (64.5)	1638			(ref.)	(ref.)	
Burning micturition	Present	84 (40.2)	125 (59.8)	209	2.12	0.145	1.25 (0.93– 1.67)	1.04 (0.76– 1.42)	0.821
	Absent	539 (35.0)	999 (65.0)	1538			(ref.)	(ref.)	
Irregular menses	Present	64 (35.8)	115 (64.2)	179	0.00	0.978	1.00 (0.73– 1.39)	0.94 (0.67– 1.32)	0.729
	Absent	559 (35.7)	1009 (64.3)	1568			(ref.)	(ref.)	
Urinary incontinence	Present	6 (27.3)	16 (72.7)	22	0.68	0.408	0.67 (0.26– 1.73)	0.69 (0.24– 1.93)	0.475
	Absent	617 (35.8)	1108 (64.2)	1725			(ref.)	(ref.)	

Adjusted for age, all eight presenting symptoms, parity, age at marriage, age at menarche, family history and tubal ligation status simultaneously (multivariable logistic regression, n=1,676). Row percentages are within each

Present/Absent stratum. Reference category (Absent) listed last within each symptom block. Pearson chi-square computed without continuity (Yates') correction. Backache and white discharge remained independently associated with cervical erosion after adjustment; pain in abdomen was significant only on unadjusted analysis, indicating confounding by the other covariates in the model. (Table 6)

Table 7. Multinomial Logistic Regression: Predictors of cervical erosion and of other cervical pathology (Polyp/Mixed Infection), Reference = Healthy Cervix (n=1,699)

Predictor	RRR (Erosion vs Healthy)	95% CI	p-value	RRR (Other vs Healthy)	95% CI	p-value
Age (per year)	0.97	0.96–0.98	<0.001	1.02	0.99–1.05	0.147
Backache – Present (vs Absent)	1.56	1.23–1.98	<0.001	1.53	0.82–2.85	0.183
White discharge – Present (vs Absent)	1.50	1.20–1.88	<0.001	1.32	0.71–2.45	0.380
Age at marriage (per year)	0.95	0.91–1.00	0.037	0.97	0.85–1.10	0.589
Age at menarche (per year)	1.09	1.02–1.17	0.011	1.16	0.97–1.39	0.094
Tubal ligation – Done (vs Not done)	0.98	0.78–1.24	0.891	2.67	1.20–5.97	0.017

RRR = relative risk ratio (exponentiated multinomial logit coefficient). "Other" pathology combines cervical polyp and mixed infection (n=57) because mixed infection alone (n=11) was too sparse to model separately. Model pseudo-R² (McFadden) = 0.044; likelihood ratio p < 0.001. Younger age, backache, white discharge, earlier age at marriage and later age at menarche independently distinguished erosion from a healthy cervix, whereas tubal ligation was the only variable independently associated with the polyp/mixed-infection group, women who had undergone tubal ligation had a substantially higher relative risk of this outcome, consistent with the older average age of this group. (Table 7)

Discussion

Present study evaluated cervical cancer screening outcomes using Smart Scope digital imaging among 1,747 rural women in Pune district and extended the analysis with multivariable modelling to identify independent predictors of cervical erosion. Consistent with the original descriptive findings, the majority of women (61.1%) had a healthy cervix, while 35.7% had cervical erosion, 2.6% had cervical polyps and 0.6% had a mixed infection. These findings are comparable to those reported by Choudhary et al in a similarly designed cross-sectional study using Smart Scope at a Rural Health Training Centre in Pune, and are broadly consistent with the range of cervical pathology detected through community-based visual and digital screening programmes in rural India more widely [14].

Age was significantly associated with screening outcome, and the Cochran–Armitage trend test confirmed a statistically significant linear decline in erosion prevalence with advancing age (p < 0.001), while the proportion of a healthy cervix rose correspondingly. This pattern is biologically consistent with the natural history of cervical

ectropion, which is estrogen-dependent, most prominent during the reproductive years, and typically regresses with age and declining estrogen exposure after menopause [1].

The mean age of women with cervical polyps (44.72 years) was significantly higher than that of women with cervical erosion (37.46 years) or mixed infection (34.91 years), consistent with the established clinical observation that endocervical polyps are more frequent in perimenopausal and postmenopausal women [1]. The Bonferroni-adjusted pairwise comparisons confirmed that this age gradient was statistically robust across pathology groups, reinforcing the value of age-stratified counselling and follow-up.

On univariate analysis, backache and white discharge were significantly associated with cervical erosion, a pattern that persisted after multivariable adjustment (adjusted OR 1.52 and 1.46 respectively). This adds quantitative, adjusted evidence to earlier descriptive observations from the same dataset and aligns with reports from other resource-limited settings that women more often present for cervical screening only once symptomatic [1]. A study in low-resource setting in rural Tamil Nadu, India, mentioned that the uptake of screening was initially low despite access to screening programmes. However, there was an increase in the community awareness increased the number of women undergoing screening [1].

A novel contribution of the present analysis is the multivariable logistic regression model, which showed acceptable calibration (Hosmer–Lemeshow $p = 0.305$) and modest discriminative ability ($AUC = 0.648$) (Fig. 5) for identifying women with cervical erosion using routinely collected age, symptom and reproductive history data alone. While an AUC in this range indicates that age and symptoms cannot substitute for direct visualization, it does suggest that a simple risk score combining age and key symptoms (backache, white discharge) could help prioritize women for screening in settings where universal coverage is not immediately feasible. Later age at menarche also emerged as an independent, though modest, predictor of erosion ($AOR = 1.08$ per year), a relationship that has not been consistently reported in the Indian rural screening literature and warrants replication. In contrast study in the population from USA reported negative association between age at menarche and malignancies of the uterus. This discrepancy may reflect differences in study population (rural, symptomatic-care-seeking Indian women versus females 12 years of age and older in the USA), and highlights the value of context-specific, adjusted analysis.

The performance characteristics of Smart Scope can be contextualized within the broader evidence on cervical screening technologies. While the present study did not conduct direct diagnostic accuracy comparisons, published literature indicates that VIA has a sensitivity of 67–79% and specificity of 49–86% for CIN2 + lesions, while VILI shows a sensitivity of 77.8–98% and specificity of 73–91.3% both methods being limited by subjectivity and inter-observer variability [15,16]. Rahatgaonkar et al. demonstrated that Smart Scope-based screening offers improved visualization and permanent documentation over naked-eye inspection and Pap testing, and recent field-based colposcopy triage models in rural India confirm that bringing digital imaging closer to the beneficiary substantially improves uptake of confirmatory evaluation [17]. Complementary state-level survey data from Kerala³⁶ and Tamil Nadu³⁷ similarly underscore persistently low awareness and screening coverage among rural Indian women, reinforcing the potential value of opportunistic, symptom-triggered digital screening models such as the one evaluated here [1].

Two further advanced analyses extended these findings. First, modelling age by group rather than as three broad bands showed a decline in erosion prevalence from 50.0% in women aged 20–29 years to 22.3% in those aged 50–59 years (Fig. 4), and the model-predicted probability curve (Fig. 6) across the full continuous age range (Fig. 6)

showed a smooth, monotonic decline after adjustment for symptoms and reproductive history – evidence against a simple threshold effect and in favor of a continuous, estrogen-mediated biological gradient. Second, because pooling cervical polyp and mixed infection with erosion in a single binary outcome could obscure pathology-specific risk factors, a multinomial logistic regression modelled erosion and “other” pathology (polyp/mixed infection) separately against a healthy cervix. This showed that the symptom- and age-related predictors of erosion did not extend to the polyp/mixed-infection group; instead, tubal ligation emerged as the only independent predictor of this outcome (RRR = 2.67, 95% CI 1.20–5.97), plausibly reflecting the older age and completed-family profile of women who undergo tubal ligation rather than a direct causal effect of the procedure itself. This distinction would not have been visible from the binary erosion model alone and illustrates the value of modelling cervical pathology sub-types separately where sample size permits.

Strengths and Limitations

Strengths of this study include its large sample size which strengthened statistical power and reliability of results, community-based rural setting provided context-specific evidence on early detection of cervical pathologies by cervical screening which will help state health policy makers in framing health policies, and programme implementation and the use of multivariable modelling with formal calibration and discrimination diagnostics rather than univariate analysis alone.

Limitations include the single-center design; the absence of histopathological or HPV-DNA confirmation of Smart Scope findings, and the modest discriminative performance of the logistic model, which reflects the inherent limits of predicting a visually diagnosed pathology from demographic and symptom data alone. As with any cross-sectional analysis, the associations reported – including those from the multivariable model should be interpreted as statistical associations rather than causal relationships.

Conclusions

Smart Scope-assisted cervical screening identified a substantial burden of cervical pathology among rural women in Pune district, with cervical erosion being the commonest abnormal finding, particularly among women aged 20–39 years. Multivariable analysis confirmed that younger age, backache, white discharge and later age at menarche were independently associated with cervical erosion, while the model showed adequate calibration for these routinely collected variables. Cervical polyps were more frequent among older women, reinforcing the value of age-stratified screening approaches. These findings support the integration of Smart Scope-based digital screening – combined with attention to symptom profile and age – into community-based cervical cancer prevention programmes in resource-limited rural settings, alongside continued efforts to expand awareness and screening coverage nationally.

Declarations

Consent for publication: Not applicable

Data availability: The data that support the findings of this study are available from the corresponding author upon reasonable request.

Competing interests: All authors declare that they have no competing interests.

Funding statement: This study received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

AUTHOR CONTRIBUTIONS

SV conceptualized and designed the study, data collection and manuscript drafting. SM: study supervision, manuscript drafting, RD: Statistical analyses, manuscript drafting, SS,MT: contributed to gynecological interpretation of Smart Scope findings and critically reviewed the manuscript for clinical accuracy. SA, APS N, AKV: critically reviewed the manuscript, AS, PS, FK: data collection and critically reviewed the manuscript.

All authors read, critically revised, and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

Acknowledgment

The authors would like to give special thanks to the study participants for their valuable contributions to the study.

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Figures

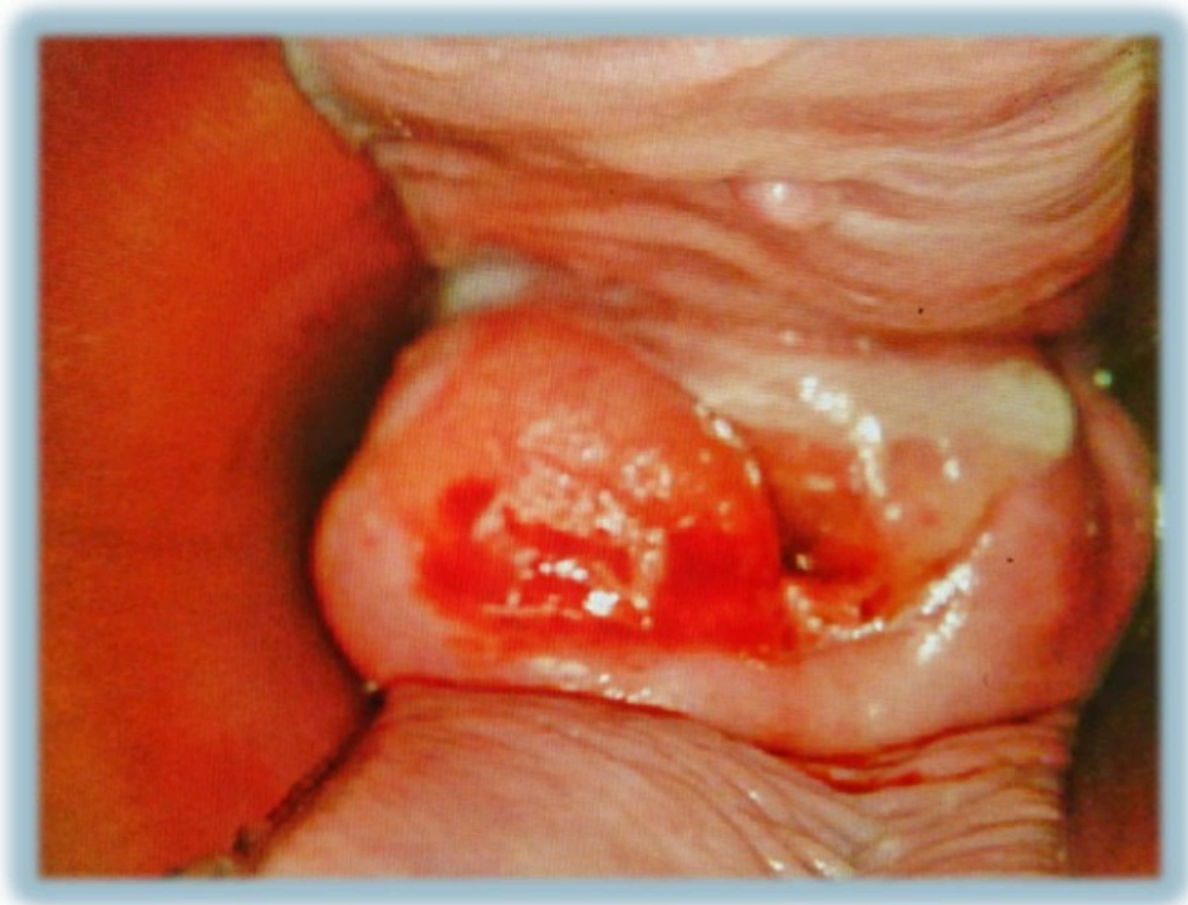


Figure 1

Cervical erosion

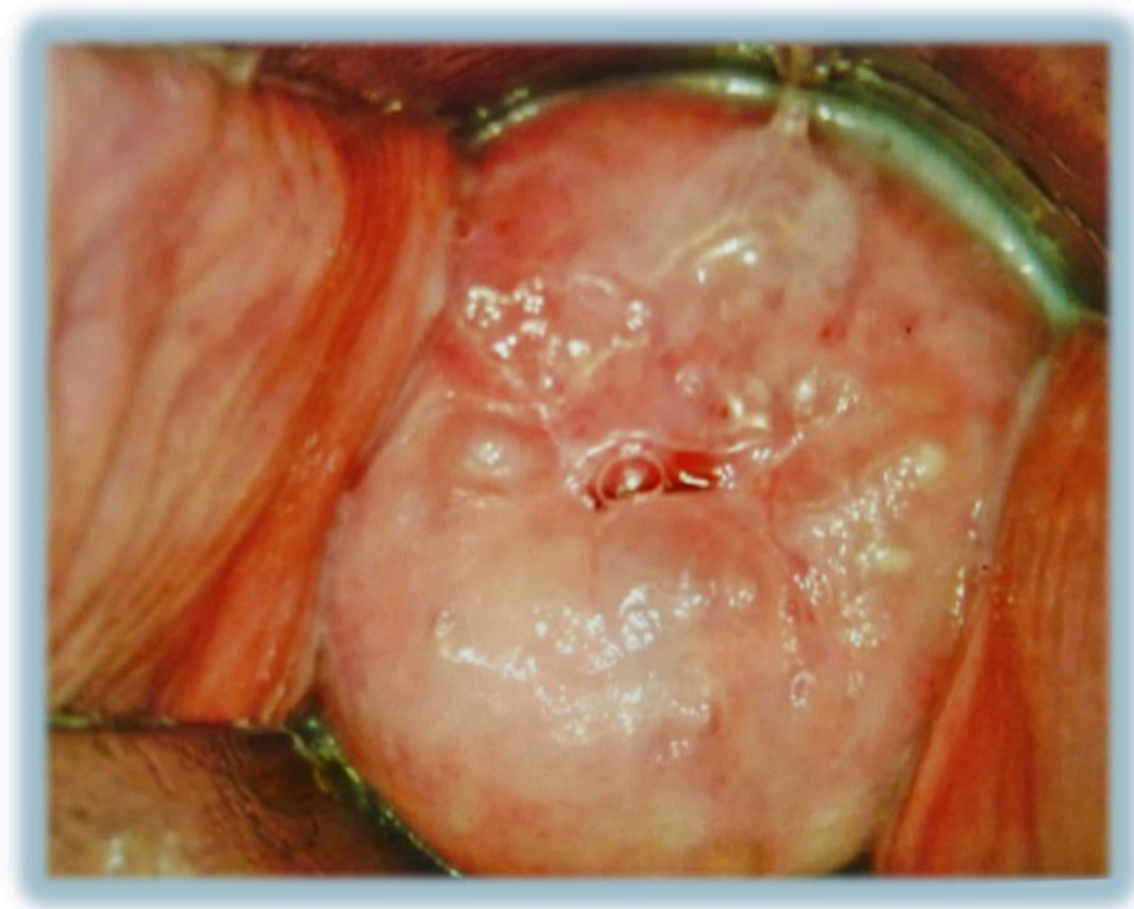


Figure 2

Healthy cervix



Figure 3

Mixed infections

Figure 4. Prevalence of Cervical Erosion by Age Group
 (Cochran-Armitage trend $Z=-6.73$, $p<0.001$; linear trend slope= $-0.64\%/yr$, $p=0.031$)

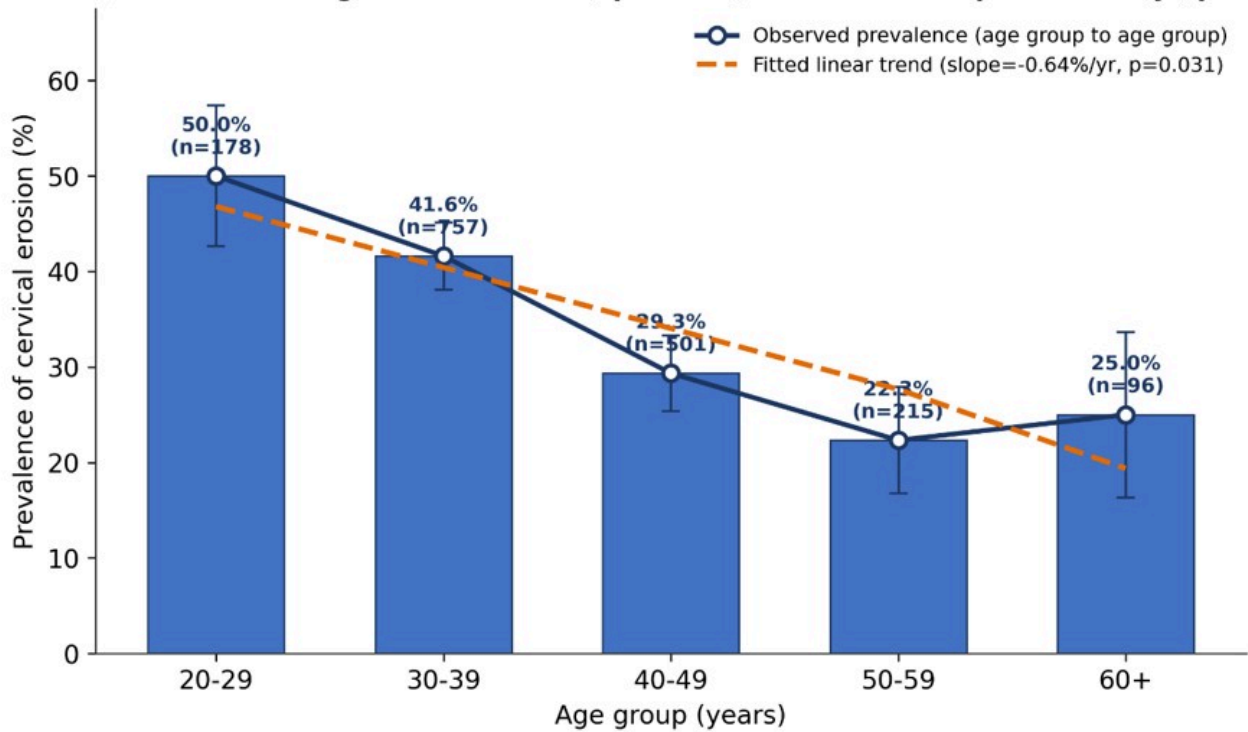


Figure 4

Prevalence of cervical erosion by age group, shown as bars with the observed prevalence trend connected in navy blue and a separately fitted linear regression trend line in orange (Cochran-Armitage trend $Z=-6.73$, $p<0.001$; linear trend slope= -0.64% per year, $p=0.031$).

Figure 5. ROC Curve of the Multivariable Model for Predicting Cervical Erosion

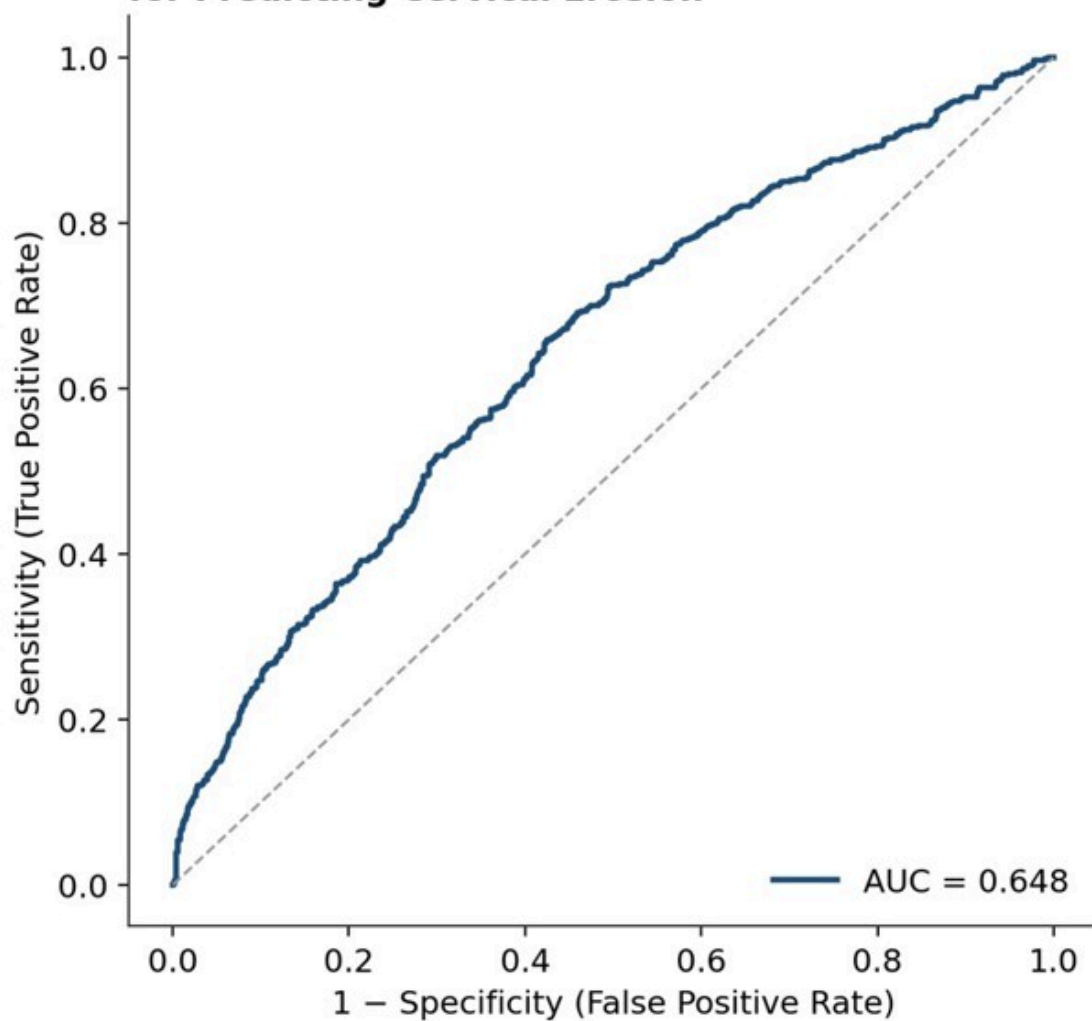


Figure 5

ROC curve of the multivariable model for predicting cervical erosion (AUC = 0.648).

**Figure 6. Model-Predicted Probability of Cervical Erosion by Age
(other covariates held at their sample mean/reference level)**

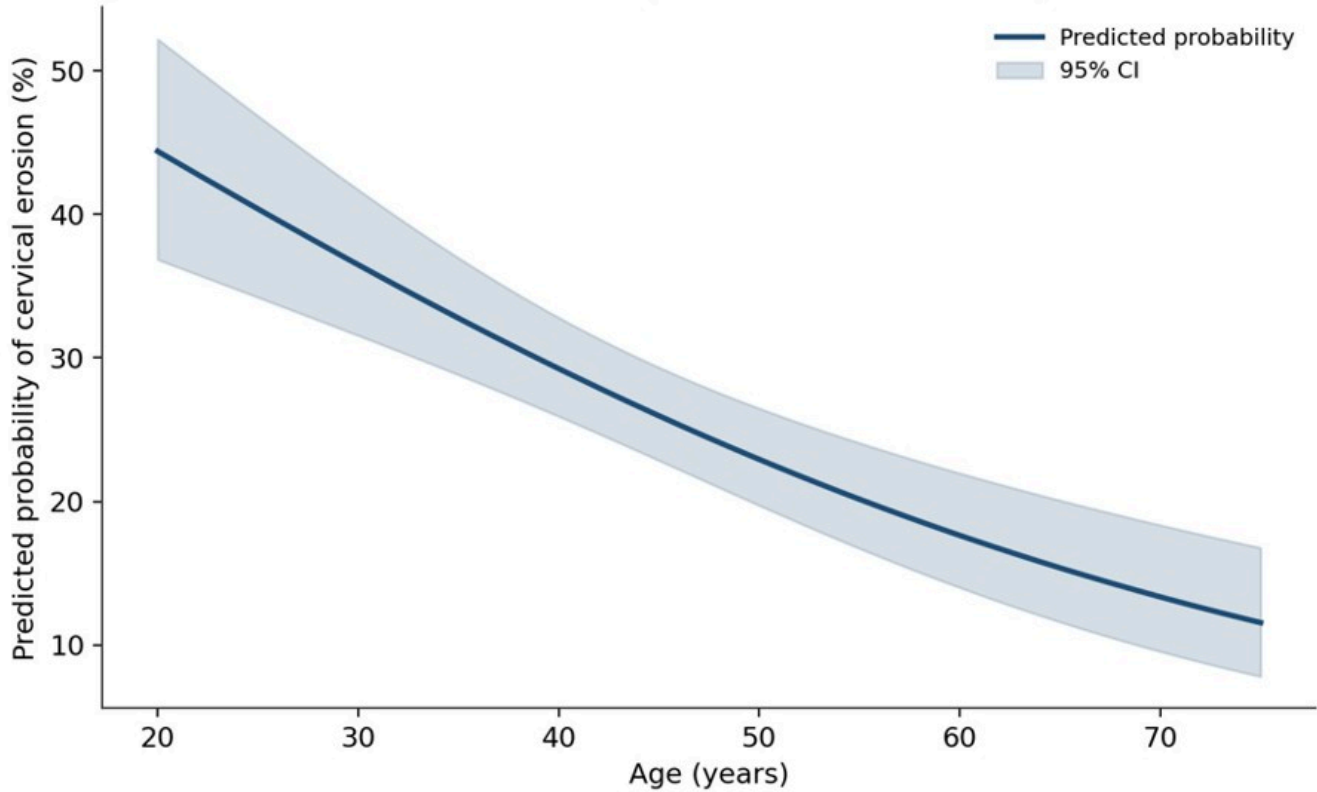


Figure 6

Model-predicted probability of cervical erosion by age, with 95% CI (other covariates held at sample mean/reference).