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Sociodemographic Profile, Clinical Characteristics, and Risk Factors of Cervical Carcinoma in VIA-Positive Women at a Tertiary Care Hospital

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Abstract

Background: Cervical carcinoma is a major cause of morbidity and mortality among women in developing countries, where screening facilities are often limited. This study aimed to evaluate the sociodemographic profile, reproductive characteristics, clinical features, risk factors, and histopathological patterns in VIA-positive women. ***Methods:*** This cross-sectional study was conducted in the Department of Obstetrics and Gynaecology, Rajshahi Medical College Hospital, Rajshahi, Bangladesh, from July 2007 to December 2007. This study included 100 VIA positive women attending the OPD of Obstetrics and Gynaecology during the study period. ***Results:*** Most participants were aged 30–39 years (49%), resided in urban areas (64%), and were predominantly housewives (77%). Nearly half (48%) had parity between 3–4, and three-fourths (75.3%) experienced their first delivery before 20 years. The mean age of menarche was 12–13 years. Excessive vaginal discharge (54%), dyspareunia (44%), and backache (30%) were the most frequent complaints, while 35% were asymptomatic. Major risk factors included early age at first coitus (78%), early childbirth (75.3%), and high parity (61%). Histopathological findings revealed normal results in 25% and inflammation in 23%, while 29% had CIN I, 12% CIN II, 6% CIN III, and 5% invasive carcinoma. Overall, 52% had pre-invasive or invasive lesions. ***Conclusion:*** The findings highlight early sexual debut, early childbirth, and high parity as key risk factors for cervical pathology in VIA-positive women. Strengthening cervical cancer screening and awareness programs is essential for early detection and prevention.

Keywords: Cervical carcinoma, VIA-positive, Risk factors, Reproductive health, Histopathology.

INTRODUCTION

Cervical cancer is a malignant tumor that develops in the cervix, the lowermost part of the uterus. When diagnosed in its early stages, it is a highly treatable condition [1]. However, it remains a significant global health challenge, with approximately 500,000 new cases and 250,000 deaths annually. The burden of this disease falls disproportionately on developing countries, where access to essential screening and treatment is often limited [2,3].

Globally, cervical cancer is the fourth most common cancer among women. In 2018 alone, an estimated 570,000 new cases were reported, accounting for 6.6% of all female cancers [4]. Tragically, about 90% of cervical cancer deaths occur in low- and middle-income countries [5-7].

This cancer is characterized by the uncontrolled multiplication of cells at the squamocolumnar junction (SCJ) of the cervix [8]. The primary cause is a persistent infection with the human papillomavirus (HPV), which can lead to precancerous changes known as cervical intraepithelial neoplasia (CIN) and eventually to invasive cancer [9]. CIN is categorized into three stages (CIN I, II, and III) based on the extent of abnormal cell growth in the cervical epithelium [10]. The high-risk HPV types 16 and 18 are responsible for roughly 70% of

cervical cancer cases and about half of all CIN3 lesions [11]. These infections are typically detected in women aged 25–30, or about a decade after their first sexual intercourse [9].

While HPV infection is the main risk factor, numerous other elements contribute to the disease's development. These include sociodemographic and socioeconomic factors, sexual and reproductive health history, and other medical comorbidities, all of which play various roles in the progression from precancerous lesions to cancer [13-15].

In Bangladesh, cervical cancer is a leading cause of cancer-related death among women. The National Institute of Cancer Research & Hospital (NICRH) reported that it constituted 26% of all female cancers between 1976 and 1981. Despite its high incidence, cervical cancer is one of the most preventable and treatable forms of cancer, but only if it is detected early and managed effectively [10]. Early diagnosis and access to treatment are therefore critical for improving survival rates [16].

Among the strategies implemented worldwide to reduce the burden of cervical cancer, screening for precancerous lesions remains a cornerstone for early detection and prevention [17]. Common screening methods include the Papanicolaou (Pap) smear, HPV DNA testing, and visual inspection with acetic acid (VIA). Cytology-based screening is considered the standard; however, it requires specialized personnel and laboratory infrastructure, making it costly and difficult to implement in low- and middle-income countries [16,18]. In contrast, VIA offers a simple, cost-effective alternative suitable for resource-limited settings. This method involves applying 3–5% dilute acetic acid to the cervix and visually inspecting it under bright light after one minute. The appearance of well-defined acetowhite areas near the SCJ indicates a positive result [18,19]. Several cross-sectional studies in less-developed countries have demonstrated promising results for VIA, supporting its use as an effective alternative to conventional cytology [20–22]. Consequently, VIA is often preferred over HPV testing or Pap smears for cervical cancer screening in resource-constrained environments [17].

In the present study, we aimed to evaluate the sociodemographic profile, reproductive characteristics, clinical features, risk factors, and histopathological patterns among VIA-positive women.

METHODOLOGY & MATERIALS

This cross-sectional study was conducted in the Department of Obstetrics and Gynaecology, Rajshahi Medical College Hospital, Rajshahi, Bangladesh, from July 2007 to December 2007. In this study, we included 100 VIA positive women attending the OPD of Obstetrics and Gynaecology during the study period.

These were the following criteria for eligibility as study participants:

Inclusion Criteria:

- Women aged 18 years or above.
- Married women with onset of sexual activity at a young age (< 20 years), even if below 30 years of age.
- Women with suspected or known sexually transmitted infections (STIs).
- Women presenting with clinical symptoms or signs suggestive of early cervical cancer.
- Women with a clinically unhealthy-looking cervix on examination.

Exclusion Criteria

- Women with previously diagnosed or treated cervical carcinoma.
- Pregnant women at the time of screening.
- Patients with severe medical comorbidities making biopsy contraindicated.
- Women unwilling to participate or who did not provide consent.

Data Collection Procedure:

Data were collected under the guidance and supervision of the research supervisor using a structured questionnaire that included both coding and non-coding items. Women attending the Gynecology Outpatient Department who met the inclusion criteria were referred to the VIA center. After obtaining informed consent and providing appropriate counseling, each patient was placed in the lithotomy position, and the cervix was exposed using a Cusco's vaginal speculum. A 5% acetic acid solution was then applied to the cervix, and after one minute the cervix was carefully inspected for acetowhite changes around the squamocolumnar junction (SCJ). Women who tested VIA-positive were further evaluated through colposcopy, and colposcopically directed biopsies were obtained from suspicious lesions and sent for histopathological examination. Data collection focused on several key outcome variables, including age, sociodemographic characteristics, reproductive and gynecological history, clinical findings, identified risk factors, as well as VIA and colposcopic findings.

Data Analysis:

All data were recorded systematically in a pre-formatted data collection form. Data were analyzed using descriptive statistics, and results were presented in frequency tables, percentages, and charts. Data analysis was performed by using SPSS 16 (Statistical Package for Social Sciences) for Windows version 10. This study was ethically approved by the Institutional Review Committee of Rajshahi Medical College Hospital.

RESULTS

Table 1: Sociodemographic Profile of the Study Subjects (n=100)

Characteristic	Number	Percentage
Age Group (years)		
< 30	23	23.0%
30-39	49	49.0%
40-49	23	23.0%
50-59	5	5.0%
Residence		
Urban	64	64.0%
Rural	36	36.0%
Occupation		
Housewife	77	77.0%
Employed	22	22.0%
Student	1	1.0%
Husband's Occupation		
Businessman	34	34.0%
Farmer	27	27.0%
Service (Govt./Private)	23	23.0%
Others	16	16.0%
Yearly Family Income (TK)		
< 30,000	27	27.0%
30,000 - 49,999	33	33.0%
> 60,000	40	40.0%

Table 1 summarizes the socio-demographic characteristics of the study population. The majority of participants (49%) were between 30–39 years of age, while 23% were below 30 years and another 23% between 40–49 years. Most participants resided in urban areas (64%) and were predominantly housewives (77%). Regarding husbands' occupations, 34% were businessmen, 27% farmers, and 23% engaged in service, with 16% belonging to other categories. In terms of yearly family income, 40% of families earned more than Tk. 60,000, 33% earned between Tk. 30,000–49,999, and 27% earned less than Tk. 30,000.

Table 2: Obstetrical and Gynecological History (n=100)

Characteristic	Number	Percentage
Parity		
0	7	7.0%
1-2	32	32.0%
3-4	48	48.0%
≥ 5	13	13.0%
Age of Menarche (in years of age)		
12	44	44.0%
13	46	46.0%
14	10	10.0%
Age at First Delivery (n=93)		
< 20 years	70	75.3%
≥ 20 years	23	24.7%
Contraceptive Use		
Hormonal	54	54.0%
None	19	19.0%
Barrier & Both	27	27.0%
Menopausal Status		
Pre-menopausal	91	91.0%
Post-menopausal	9	9.0%

Table 2 presents the reproductive characteristics of the respondents. Nearly half of the participants (48%) had parity between 3–4. The mean age of menarche was commonly 12–13 years, with 44% experiencing menarche at 12 years and 46% at 13 years. Among those who had delivered (n=93), the majority

(75.3%) had their first delivery before 20 years of age, while 24.7% delivered at 20 years or above. Regarding contraceptive practices, 54% reported using hormonal methods, 27% used barrier or combined methods, whereas 19% reported no contraceptive use. Most participants (91%) were pre-menopausal, with only 9% being post-menopausal.

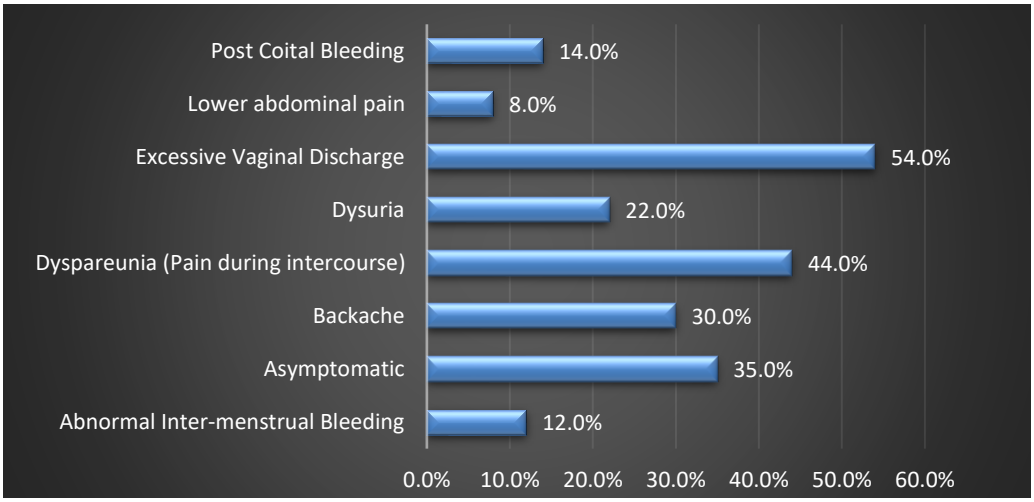

Figure 1: Distribution of Study Participants by Presenting Complaints (n=100)

This figure illustrates the presenting complaints of the study participants. The most frequently reported symptom was excessive vaginal discharge (54%), followed by dyspareunia (44%) and backache (30%). About 35% of participants were asymptomatic. Other complaints included dysuria (22%), post-coital bleeding (14%), abnormal inter-menstrual bleeding (12%), and lower abdominal pain (8%).

Table 3: Prevalence of Risk Factors in Study Subjects (n=100)

Risk Factor	Number	Percentage
High Parity (≥3 children)	61	61.0%
Early Age at First Coitus (≤17 years)	78	78.0%
Early Age at First Delivery (<20 years)	70	75.3%
History of Extramarital Exposure	17	17.0%
Unsatisfactory Personal Hygiene	31	31.0%
Family History of Cancer	9	9.0%
History of STI	2	2.0%

Table 3 shows that a majority of the women had early age at first coitus (78%) and early age at first delivery before 20 years of age (75.3%). High parity (≥3 children) was reported in 61% of participants. Other risk factors included unsatisfactory personal hygiene in 31% and history of extramarital exposure in 17%. Family history of cancer (9%) and history of sexually transmitted infection (2%) were comparatively less common.

Table 4: Final Histopathological Diagnosis (Colposcopically Directed Biopsy)

Diagnosis	Number	Percentage
Normal	25	25.0%
Inflammation	23	23.0%
Pre-invasive Disease (CIN)		
CIN I	29	29.0%
CIN II	12	12.0%
CIN III	6	6.0%
Invasive Carcinoma	5	5.0%
Total Pre-invasive & Invasive	52	52.0%

Table 4 shows the histopathological diagnoses of the study participants. One-fourth (25%) had normal findings, while 23% showed inflammation. Among those with pre-invasive disease (CIN), 29% had CIN I, 12% had CIN II, and 6% had CIN III. Invasive carcinoma was identified in 5% of participants. Overall, the combined proportion of pre-invasive and invasive lesions was 52%,

indicating that more than half of the study population had some form of cervical pathology.

DISCUSSION

In the present study, nearly half of the participants (49%) were aged 30–39 years, which is consistent with findings from Biswas *et al.,* who reported that 41.1% of patients were between 31 and 40 years [10]. Similarly, another study documented a mean age of 32.7 ± 9.0 years [23], while a comparable study found that 42% of patients were aged 35–45 years [24].

With regard to socioeconomic status, 40% of families in the current study had an annual income above Tk. 60,000, 33% earned between Tk. 30,000–49,999, and 27% earned less than Tk. 30,000. In contrast, Biswas *et al.,* observed that 51.6% of patients' families reported a monthly income of Tk. 10,000–20,000 [10]. Other studies also highlighted the predominance of lower socioeconomic backgrounds, with 60% of participants belonging to the lower socioeconomic class [24] and 75.56% categorized as low socioeconomic status [25], supporting the present findings.

The most common presenting symptom in this study was excessive vaginal discharge (54%), followed by dyspareunia (44%) and backache (30%). Less frequent complaints included dysuria (22%), post-coital bleeding (14%), intermenstrual bleeding (12%), and lower abdominal pain (8%). Biswas *et al.,* similarly reported intermenstrual bleeding in 40% of patients, post-coital bleeding in 27.4%, and watery discharge in 31.6% [10]. Other studies have also identified vaginal discharge as the predominant complaint, with prevalence ranging from 76% to 84%, while abdominal pain was reported in up to 40% of cases [10,24].

In terms of reproductive characteristics, almost half of the participants (48%) had a parity of 3–4, and 32% had 1–2 children. Biswas *et al.,* found a similar distribution, with 48.4% of women having para 2, and reported a mean parity of 2.52 ± 1.26, comparable to other studies that emphasized multiparity as a common feature [10,24]. Most participants (91%) were premenopausal, with only 9% postmenopausal. The average age of menarche was 12–13 years, and the majority (75.3%) experienced first delivery before 20 years of age. Biswas *et al.,* also reported that 55.8% of patients delivered before 18 years, with a mean age at first delivery of 17.87 ± 1.72 years [10].

Contraceptive use patterns showed that 54% of participants used hormonal methods, 27% used barrier or combined methods, and 19% reported no contraceptive use. Biswas *et al.,* reported a similar distribution, with 43.2% using oral contraceptive pills, 9.4% using condoms, 6.3% using injections, and 41.1% not using any contraception [10].

The present study identified several key risk factors: early age at first coitus (78%), first delivery before 20 years (75.3%), high parity (≥3 children, 61%), unsatisfactory personal hygiene (31%), and history of extramarital exposure (17%). Family history of cancer (9%) and history of sexually transmitted infection (STI, 2%) were less common. Tekalegn *et al.,* reported parity, post-coital bleeding (PCB), smoking, STI, and multiple sexual partners as significant determinants of VIA positivity [26]. In our study, 2% of women had an STI history, consistent with Tekalegn *et al.*'s finding that women with prior STI had twice the odds of VIA positivity [26]. This is supported by several studies from Ethiopia and elsewhere [27-30], reflecting the strong association between STI, HPV infection, and cervical cancer risk [26].

High parity also emerged as an important determinant in this study. Women with three or more children had higher VIA positivity, a finding supported by Tekalegn *et al.,* who reported that women with parity ≥4 had twice the risk compared to those with fewer children [26]. Similar associations have been reported in Debremarkos and Jimma (Ethiopia) [31,32], in a review by Castellsague *et al.,* [33], and in a cohort study by Jensen *et al.,* [34]. However, studies from Israel and Rwanda reported high parity as protective (AOR=0.39 and 0.42, respectively) [35,36], suggesting possible regional or population-based differences.

PCB was also strongly associated with VIA positivity in this study, with affected women having three times higher odds, consistent with Tekalegn *et al.,* and with findings from Israel, where PCB was identified as a significant risk factor for cervical dysplasia (AOR=1.82) [35]. In addition, another study showed that longer sexual exposure and younger age at first intercourse were significantly associated with preinvasive and invasive cervical lesions [37].

Limitations of the study

This study was a single-center study. We took a small sample size due to the short study period, which may limit the generalizability of the findings to the wider population. Being a cross-sectional study, it was not possible to establish causal relationships between risk factors and cervical pathology. Additionally, as only VIA-positive women were included, the prevalence of risk factors and pathology in the general population could not be assessed.

CONCLUSION AND RECOMMENDATIONS

The study highlights that VIA-positive women commonly present with multiple risk factors for cervical carcinoma, including early age at sexual debut, early childbirth, and high parity. Excessive vaginal discharge and dyspareunia were the most frequent clinical complaints, although a significant proportion of women remained asymptomatic. Histopathological evaluation revealed that more than half of the participants had pre-

invasive or invasive lesions, underscoring the importance of early detection. These findings emphasize the need to strengthen cervical cancer screening programs, improve awareness regarding risk factors, and promote preventive strategies to reduce the burden of cervical carcinoma in Bangladesh.

Further study with a prospective and longitudinal study design, including a larger sample size, needs to be done to validate the findings of this study.

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Conflict of interest: None declared.

Ethical approval: This study was ethically approved.

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