**The *European Journal of Cardiovascular Medicine (EJCM)***
**Print ISSN : 2042-4884**
**E-ISSN : 2042-4892**
**Volume: 14 | Issue 04 | July-Aug. | 2024**
Journal homepage: https://www.healthcare-bulletin.co.uk/

Research Article

# Evaluation of High-Risk Human Papillomavirus Serotypes as a Primary Screening Tool for Cervical Cancer in a Tertiary Care Center

**Dr. Naidu Jyotsna K Madhu[1], Dr. Rajiv Kumar Saxena[2], Dr. Alisha Singh[3], and Dr. Meghasri K[4]**
[1]2nd year PG The Oxford Medical College Hospital and Research Centre, Bangalore, India.
[2]Professor and HOD OBG The Oxford Medical College Hospital and Research Centre, Bangalore, India.
[3]Assistant professor The Oxford Medical College Hospital and Research Centre, Bangalore, India.
[4]2nd year PG, The Oxford Medical College Hospital and Research Centre, Bangalore, India.

**Submission: 10/05/2024; Received: 28/06/2024; Revision: 15/07/2024; Published: 03/08/2024**

***Corresponding author: Dr. Meghasri K** *(meghasrikoppuravuri@gmail.com)*
**DOI: https://doi.org/10.61336/ejcm/24-4-65**

**Abstract:** Cervical cancer represents a critical public health challenge, especially in developing countries where it significantly contributes to cancer-related mortality among women. Human papillomavirus (HPV) infection is a primary etiological factor for cervical cancer. In India, cervical cancer accounts for 9.4% of all cancers and 18.3% of new cancer cases. Despite the availability of cytological screening methods such as the Papanicolaou (Pap) smear, issues with sensitivity and coverage highlight the need for alternative strategies, such as HPV-DNA testing. This study aims to evaluate the prevalence of high-risk HPV serotypes (16, 18, 31, and 45) in women aged 25-65 years attending a tertiary care center, and assess the utility of HPV-DNA testing in primary cervical cancer screening.

**Keywords:** Cervical cancer, Human papillomavirus (HPV), HPV-DNA testing, High-risk HPV serotypes, Cervical cancer screening

## INTRODUCTION

Cervical cancer remains a significant global health issue, particularly in developing regions where it is a leading cause of cancer-related deaths among women. The primary etiological factor for cervical cancer is infection with high-risk human papillomavirus (HPV) types. In India, cervical cancer is responsible for 9.4% of all cancer cases and 18.3% of new cancer cases annually. Although cytological screening methods such as the Papanicolaou (Pap) smear have been widely used, their sensitivity and coverage limitations necessitate exploration of alternative screening methods, including HPV-DNA testing.

HPV-DNA testing, which directly detects HPV in cervical specimens, may serve as an alternative or adjunct to cytological screening. Recent studies suggest that HPV testing is more sensitive than Pap smears for detecting high-grade dysplasia, though it is less specific. Women with positive HPV tests often undergo additional Pap tests or diagnostic procedures for cytological or histological confirmation of disease. The causal link between high-risk HPV infections and cervical cancer has prompted the development of strategies to enhance screening performance and cancer prevention. Given its higher sensitivity, HPV-DNA testing is increasingly considered for primary screening.

### Aims and Objectives

**Aim:** To screen for high-risk HPV serotypes (16, 18, 31, and 45) in women aged 25-65 years in a tertiary care center.

**Objective:** To describe the prevalence of high-risk HPV serotypes 16, 18, 31, and 45 among women attending the outpatient department (OPD) of the Department of Obstetrics and Gynecology at a tertiary care center.

## MATERIALS AND METHODS

**Study Design**: Prospective study
**Sample Size**: 14
**Study Period**: June-August 2023
**Place of Study**: The Oxford Medical College, Hospital & Research Centre, Bangalore

**Inclusion Criteria:**

- Consenting patients aged 25-65 years attending clinics in the Department of Obstetrics and Gynecology.

**Exclusion Criteria:**

1. Active vaginal bleeding at the time of examination
2. Women with a history of hysterectomy (unless there is a history of previous cervical intraepithelial neoplasia)
3. Women unwilling to undergo vaginal examination
4. Pregnant women with a normal cervix on speculum examination

**Procedure Details:**

Ethics approval was obtained prior to the study. Fourteen

participants were selected and provided written informed consent. Detailed history and examination were conducted. Endocervical swab samples were collected from all consenting women. The swabs were tested for the presence of high-risk HPV DNA using the "Truenat® HPV-HR" test, a room-temperature stable, chip-based real-time PCR test for detecting HPV-16, 18, 31, and 45. Statistical analysis was performed using SPSS version 25.0.

## RESULTS

The demographic characteristics and HPV-DNA test results are summarized as follows:

| Demographic Variables | Total Women Screened (n=14) | Screen Positive (n=3) | Screen Negative (n=11) | P-Value |
|---|---|---|---|---|
| Age (mean ± SD) | 37.57 ± 9.27 | 41.2 ± 8.03 | 36.75 ± 7.23 | 0.008 |
| Age at First Sexual Intercourse (mean ± SD) | 19.21 ± 3.91 | 17.91 ± 2.92 | 20.01 ± 3.94 | 0.001 |
| Age at First Childbirth (mean ± SD) | 21.33 ± 3.78 | 20.01 ± 2.99 | 22.45 ± 3.16 | 0.03 |

**Complaints Reported:**

- Menorrhagia with dysmenorrhea
- Abnormal uterine bleeding (AUB)
- Amenorrhea
- Vaginal discharge with dyspareunia and post-coital bleeding occasionally
- Irregular menstrual cycles
- Abdominal pain with vaginal discharge

**HPV-DNA Test Results:**

| HPV-DNA Test Result | Frequency |
|---|---|
| Negative | 11 |
| Positive (HPV-18/45, Very Low) | 2 |
| Positive (HPV-16/31, Medium) | 1 |
| Grand Total | 14 |

The overall prevalence of HPV was 26.67%. Of these, HPV-18/45 contributed to 13.33%, and HPV-16/31 contributed to 13.33%.

## DISCUSSION

This study aimed to assess HPV-DNA testing as a primary screening method for cervical cancer, particularly in resource-limited settings. HPV-DNA testing has several advantages over cytological screening, including standardization and the ability to provide quantitative results. Unlike cervical cytology, which is subjective and requires skilled cytotechnicians, HPV-DNA testing can be performed by mid-level technicians and processed in high volumes

## CONCLUSION

HPV infection is a well-established cause of cervical cancer. The growing interest in HPV diagnostics underscores its potential role in cervical cancer prevention programs. The findings of this study emphasize the value of HPV-DNA testing as a primary screening tool, especially in rural and underserved areas. By identifying the prevalence of high-risk HPV serotypes, this research contributes to the development of effective cervical cancer screening programs.

## REFERENCES

1. Sathishkumar K, Chaturvedi M, Das P, Stephen S, Mathur P. Cancer incidence estimates for 2022 & projection for 2025: Result from the National Cancer Registry Programme, India. Indian J Med Res. 2022;156(4-5):598-607. doi: 10.4103/ijmr.ijmr_1821_22.
2. Meijer CJ, Berkhof J, Castle PE, Hesselink AT, Franco EL, Ronco G, et al. Guidelines for human papillomavirus DNA test requirements for primary cervical cancer screening in women 30 years and older. Int J Cancer. 2009;124(3):516-20. doi: 10.1002/ijc.24010.
3. Hariprasad R, Tulsyan S, Babu R, Dhanasekaran K, Thakur N, Hussain S, et al. Evaluation of a chip-based, point-of-care, portable, real-time micro PCR analyzer for the detection of high-risk human papillomavirus in the uterine cervix in India. JCO Glob Oncol. 2020;6:1147-54. doi: 10.1200/go.20.00024.
4. Sankaranarayanan R, Nene BM, Shastri SS, Jayant K, Muwonge R, Budukh AM, et al. HPV screening for cervical cancer in rural India. N Engl J Med. 2009;360(14):1385-94. doi: 10.1056/NEJMoa0808516