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Early sexual intercourse and human papillomavirus as risk factors of cervical intraepithelial neoplasia

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Introduction: Cervical intraepithelial neoplasia (CIN) is a premalignant lesion that is diagnosed by histology as CIN1, CIN2, or CIN3. Cervical intraepithelial neoplasia results from HPV infection within cervical cells[1]. An earlier age at first sexual intercourse (AFSI) is associated with an elevated risk of HPV acquisition due to cervical cellular immaturity and a reduced capacity to clear persistent infections. HPV infections are mainly transmitted through sexual contact and thus all women who are sexually active are at risk of cervical cancer[2]. Among these factors, the relative contributions and impacts of AFSI and HPV infection have attracted significant interest, but remain insufficiently investigated.

Purpose of the study: Investigate the association between AFSI and HPV infection as independent and synergistic risk factors for CIN. By assessing various ages at which women experience their first sexual intercourse this study seeks to evaluate the impact of these ages on the susceptibility of acquiring CIN.

Materials and method: This correlational study using structured questionnaire and theoretical framework review was conducted among women of different age groups from 20-30 years old. The study population was restricted to women without cervical cancer history. Additionally, data were extracted from 8 related scientific journals for comprehensive multivariate analysis.

Research result: This study analyzed 186 women with histologically confirmed of CIN. The results demonstrated a significant inverse relationship between AFSI and CIN prevalence. The women with AFSI ≥21 years (n=34, 16,28%) with odds ratio (OR) was (OR: 1.80), while those with AFSI 17-20 years (n=71, 38,17%) showed elevated risk (OR: 2.44), and the youngest debut group AFSI ≤16 years, (n=81, 43,55%) exhibited the highest risk (OR: 4.09). Additionally, the HPV prevalence analysis revealed 17 cases among women with AFSI ≥21 years (OR: 1.00), 36 cases in the AFSI 17-20 years group (OR: 2.10), and 42 cases in the AFSI ≤16 years (OR: 2.48). Questionnaire-derived data from 47 participants showed significant ($p<0.05$) distribution patterns: 11 participants (23,40%) reported AFSI ≥21 years, 13 (27,66%) reported AFSI 17-20 years, and 23 (48,94%) reported AFSI ≤16 years. The study shows AFSI and HPV infection were the most important factors in the development of CIN, according to the strong correlation that was discovered.

Conclusion: This study establishes that ASFI and persistent HPV infection as significant risk factors for CIN progression. Early sexual debut potentiates HPV susceptibility through cervical epithelial immaturity and impaired immune clearance, while microtrauma during coitus facilitates viral entry at the transformation zone adjacent to the squamocolumnar junction (SCJ). Adolescent cervical ectopy exposes metaplastic epithelium at the SCJ, creating a vulnerable microenvironment for neoplastic transformation. Hormonal changes promote a thinner squamous epithelium and greater columnar cell presence in the cervix of reproductive-aged women. This reduces transformation zone dynamics, enabling persistent HPV infection to cause CIN. These findings underscore the need for targeted interventions addressing early AFSI in high-risk populations in prevention of CIN.

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