

Category: Clinical Research

Title: HPV-Associated Condyloma Acuminata: Therapeutic Challenges in Immunocompromised and Pregnant Patients

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Abstract

Background: Condyloma acuminata, or anogenital warts, are caused primarily by low-risk human papillomavirus (HPV) types 6 and 11 and represent one of the most common sexually transmitted infections worldwide. The condition carries substantial psychosocial and sexual health implications, with management challenges heightened in immunocompromised and pregnant populations. These groups experience greater disease persistence, higher recurrence rates, and limited therapeutic options due to safety concerns. The objective of this review was to summarize current and emerging evidence on management strategies for condyloma acuminata in these vulnerable populations.

Methods: A narrative review of the literature was performed using PubMed, Embase, and recent international clinical guidelines. Studies evaluating therapeutic efficacy, recurrence, safety, and tolerability across destructive, topical, systemic, and immunotherapeutic modalities were included. Data were synthesized to identify trends in treatment response and recurrence among immunocompromised and pregnant patients.

Results: HPV infects basal epithelial cells, inducing proliferation while evading host immune surveillance. Immunocompromised patients, such as those with HIV infection or solid organ transplants, often present with extensive, treatment-resistant lesions due to impaired cell-mediated immunity. Pregnant women experience accelerated lesion growth from hormonally driven immune modulation, though spontaneous regression frequently occurs postpartum. Across studies, physical modalities, including cryotherapy, trichloroacetic acid, and CO₂ laser ablation, achieved clearance rates exceeding 70% and were preferred during pregnancy for safety. Topical therapies such as podophyllin, podophyllotoxin, and imiquimod were contraindicated due to teratogenic or unproven safety profiles. In immunocompromised populations, recurrence rates remained as high as 30–60%, often necessitating combination or repeated treatments. Prophylactic HPV vaccination reduced recurrence, while therapeutic vaccines and novel immunomodulators showed encouraging early-phase results.

Conclusion: Condyloma acuminata continues to pose significant management challenges, particularly among patients with altered immune function or physiologic states such as pregnancy. Evidence supports the use of safe, ablative modalities during pregnancy and combined or adjunctive approaches in immunocompromised hosts. Future research should prioritize immunologic and vaccine-based therapies to improve clearance durability and reduce recurrence in these high-risk groups.

References

1. Chilaka VN, Navti OB, Al Beloushi M, Ahmed B, Konje JC. Human papillomavirus (HPV) in pregnancy - An update. *Eur J Obstet Gynecol Reprod Biol.* 2021;264:340-348. doi:10.1016/j.ejogrb.2021.07.053
2. Ardekani A, Taherifard E, Mollalo A, et al. Human Papillomavirus Infection during Pregnancy and Childhood: A Comprehensive Review. *Microorganisms.* 2022;10(10):1932. Published 2022 Sep 28. doi:10.3390/microorganisms10101932
3. Condrat CE, Cretoiu D, Radoi VE, et al. Unraveling Immunological Dynamics: HPV Infection in Women- Insights from Pregnancy. *Viruses.* 2023;15(10):2011. Published 2023 Sep 27. doi:10.3390/v15102011
4. Hewavisenti RV, Arena J, Ahlenstiel CL, Sasson SC. Human papillomavirus in the setting of immunodeficiency: Pathogenesis and the emergence of next-generation therapies to reduce the high associated cancer risk. *Front Immunol.* 2023;14:1112513. Published 2023 Mar 7. doi:10.3389/fimmu.2023.1112513

5. Bosch FX, Broker TR, Forman D, et al. Comprehensive Control of Human Papillomavirus Infections and Related Diseases. *Vaccine*. 2013;31(7):H1-H31.
6. Matucci-Cerinic C, Herzum A, Ciccarese G, et al. Therapeutic Role of HPV Vaccination on Benign HPV-induced Epithelial Proliferations in Immunocompetent and Immunocompromised Patients: Case Study and Review of the Literature. *Open Forum Infectious Diseases*. 2024. 11(7): ofae369.
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