



Human Papillomavirus (HPV) and Infertility: An Emerging Concern

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Human papillomavirus (HPV) infection is widely recognized as a primary cause of cervical cancer and genital warts (1,2). However, emerging evidence suggests a potential, though complex, link between HPV and infertility in both men and women (3,4).

In women, the association between HPV and infertility is less direct. While HPV does not directly infect the reproductive organs, it can contribute to cervical abnormalities, including cervical intraepithelial neoplasia (CIN), which often requires treatment. Loop electrosurgical excision procedure (LEEP), a common CIN treatment, can sometimes lead to cervical stenosis or insufficiency, potentially increasing the risk of preterm birth and subsequent infertility (5,6). Furthermore, the presence of high-risk HPV types has been correlated with altered vaginal microbiota (7,8), which could indirectly impact fertility by disrupting the vaginal environment necessary for sperm survival and fertilization (10).

The connection between HPV and male infertility is gaining increasing attention (11,12). Studies have detected HPV DNA in seminal fluid, suggesting a direct route for the virus to impact sperm parameters. Research indicates that HPV infection in sperm can negatively affect sperm motility (13), morphology, and DNA integrity (14). HPV can bind to spermatozoa, potentially interfering with their ability to penetrate the oocyte. Moreover, HPV infection has been linked to increased levels of reactive oxygen species in seminal fluid, leading to oxidative stress and further damage to sperm DNA (15,16). Interestingly, some studies suggest that HPV-infected sperm might have a reduced capacity to fertilize oocytes, contributing to unexplained infertility (17).

Despite these findings, several crucial aspects require further investigation. The exact mechanisms by which HPV impacts sperm function and female reproductive health remain to be fully elucidated. It is also important to determine the prevalence of HPV in infertile couples, and to evaluate the effectiveness of HPV vaccination in preventing HPV-related infertility. Additionally, research

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is needed to explore potential treatment strategies for HPV-infected individuals facing fertility challenges.

In conclusion, while the role of HPV in infertility is still under investigation, accumulating evidence suggests a potential link, particularly in men. Clinicians should be aware of these emerging findings and consider HPV testing, especially in cases of unexplained infertility. Future research should focus on clarifying the underlying mechanisms and exploring potential interventions to mitigate the impact of HPV on reproductive health.

Competing Interests

None declared.

Ethical Issues

Not applicable.

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