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Review Article

Overview of the human papilloma virus: types and its treatment

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ABSTRACT

The human papillomavirus (HPV) is the most prevalent sexually transmitted disease in the United States and one of the most common causes of sexually transmitted infections (STDs) globally. Warts are cutaneous and occasionally mucous lesions brought on by HPV, with 2-20% of elementary school students getting them. There are three types of warts: non-genital warts, flat warts, and plantar warts. Non-genital warts are hyperkeratotic, exophytic, dome-shaped papules or plaques commonly associated with HPV-1, 2, 4, 27, or 57. Flat warts appear as flesh-coloured, erythematous to brown, or hyperpigmented smooth papules with a flat top and a diameter of 2 to 5 mm. Plantar warts, also known as verrucae plantaris, are cutaneous lesions on the plantar aspect of the foot that result from a human papillomavirus infection of keratinocytes (HPV). Genital warts are transmitted through sexual contact, while autoinoculation and vertical transfer do occasionally happen. After engaging in sexual activity with an infected partner, about 70% of people experience anogenital warts. Treatment for HPV includes imiquimod cream formulations, photodynamic treatment (PDT), green tea, chemical cautery, fluorouracil cream, cryotherapy, and surgical treatment. Common warts are hyperkeratotic, exophytic, dome-shaped papules or plaques commonly found in fingers, dorsal surfaces of hands, knees, or elbows. Flat warts are flesh-coloured, erythematous to brown, or hyperpigmented smooth papules with a flat top and a diameter of 2 to 5 mm. Plantar warts are unique in their location and appearance, primarily affecting high-pressure locations on the palms and soles and are uniquely linked to HPV type 1.

Keywords: HPV, Warts, HPV types, Treatment

INTRODUCTION

The human papillomavirus, or HPV, is considered to be the most prevalent sexually transmitted virus in the United States and one of the most common causes of STDs in both men and women globally.¹ Warts are cutaneous and occasionally mucous lesions that are brought on by one of the numerous human papillomaviruses. According to reports, 2-20 percent of elementary school students get warts, which are the third most common skin condition seen in clinical settings. The frequency is significantly higher in adults.² Men and women can contract HPV, however due to women's greater vulnerability to HPV infection of cervical cells, the burden of disease that can be attributed to HPV is substantially higher.³

TYPES OF WARTS

Nongenital warts

Non-genital warts (verrucae) are an extremely common, benign, and usually self-limited skin disease. Infection of epidermal cells with the human papillomavirus (HPV) results in cell proliferation and a thickened, warty papule on the skin. Any area of skin can be infected, but the most common sites are the hands and feet.⁴

Common warts

Hyperkeratotic, exophytic, dome-shaped papules or plaques that are commonly associated with HPV-1, 2, 4,

27 or 57 are known as common warts. The fingers and dorsal surfaces of the hands, as well as other trauma-prone areas like the knees or elbows, are where they are most commonly found. Nevertheless, compared to flat warts, this Köbner-like isomorphic phenomena is less pronounced. Common warts in addition have morphological variants- filiform warts, periungual warts, and pigmented warts. Since they don't have a viral envelope, they are resistant to heat and desiccation.⁵

Flat warts

Face, neck, and extremities are the most prevalent places for flat warts to appear. They appear as flesh-colored, erythematous to brown, or hyperpigmented smooth papules with a flat top and a diameter of 2 to 5 mm. There could be two to several hundred lesions. Shaving causes autoinoculation, which then spreads lesions, particularly in the legs of women and the beard area of men. The Köbner phenomenon is responsible for the typical linear array of lesions. Flat warts can occasionally mimic other lesions. Hyperpigmented flat warts can be confused with ephelides or lentigines.⁷

Plantar warts

Plantar warts, also known as verrucae plantaris, are cutaneous lesions on the plantar aspect of the foot that result from a human papillomavirus infection of keratinocytes (HPV). HPV, the virus that causes plantar warts, is actually a collection of nonenveloped DNA viruses that are divided into over 150 varieties based on similarities in their DNA sequences.⁸ Plantar warts can be broadly classified into several subgroups based on their clinical appearance:

Mosaic plantar warts

Plantar warts that are mosaic in nature have a pattern like tiles, which have been likened to the convergence of several warts. The cyclical projections that wart tissue naturally creates have been identified as the source of the pattern.⁹

Deep plantar warts

Myrmecia warts are particularly difficult to treat due to their location and appearance. Myrmecia, sometimes referred to as deep palmar or plantar warts, are unique in that they primarily affect high-pressure locations on the palms and soles and are uniquely linked to HPV type 1 (HPV1).¹⁰

Genital warts

Sexual contact is the primary means of transmission for genital warts, while autoinoculation and vertical transfer do occasionally happen. After engaging in sexual activity with an infected partner, genital warts affect about 70% of people.¹¹ *Condylomata acuminata*, commonly referred to

as anogenital warts or genital warts, are elevated lesions that appear on the skin and mucous membranes following an infection with certain strains of HPV, a virus spread through sex-related contact.¹²

TREATMENT FOR HPV

There are currently new imiquimod cream formulations on the market with concentrations of 2.5% and 3.75%. Recently, imiquimod 3.75% cream (Zyclara 3.75%) was approved for use in the treatment of external anogenital warts in both the United States and Canada. For a maximum of eight weeks, or until the lesions disappear, this cream is administered once daily. The greatest outcomes were observed in women (full clearance in up to 37% of instances) in phase III studies, when complete clearance was attained in 29% of patients (compared to 10% of patients who used a placebo cream).¹³

The foundation of photodynamic treatment (PDT) is the immune system's reaction to tissue damage brought on by a phototoxic reaction. It has been observed that 5-aminolevulinic acid accumulates more in HPV-infected cells than in normal skin nearby.¹¹ PDT has been suggested as a treatment for lesions that are resistant to treatment and lesions that come back even after another treatment was correctly administered. Additionally, vulvar or cervical intraepithelial neoplasia can be treated with PDT.¹³ Because it contains catechins, the plant known as green tea (*Camellia sinensis*) has sparked a lot of attention due to its ability to improve health and combat disease. Research indicates that these supplements work well to remove genital warts and may have anti-cancer properties as well.¹⁴

Although vaginal or anal lesions can also be treated with TCA, chemical cautery using a solution of 60 to 90 percent trichloroacetic acid (TCA) works best for treating a few tiny, wet lesions. Apply a small amount and let it dry until a white frosting starts to form. The patient should be advised to wash the region with liquid soap or sodium bicarbonate if excess TCA is administered to non-affected tissue.¹⁵ Due to the significant local side effects and teratogenicity associated with 5 percent fluorouracil cream (Efudex), treatment with this cream is no longer indicated. On the other hand, patients with refractory disease may benefit from intralesional injection of fluorouracil, adrenaline, and bovine collagen gel, as demonstrated by Phase 3 clinical trials.¹⁵

Surgical treatment for warts involves removal to the dermal-epidermal junction. Options include tangential scissor excision, shave excision, curettage, and the loop electrosurgical excision procedure (LEEP). Treatment may cause scarring, operator experience is important, especially with LEEP, to avoid too deep a removal. The patient can be wart-free in one visit, but treatment requires local anesthesia and possibly specialist referral. This method is best for many warts or if a large area is involved.¹⁵ The first course of treatment is cryotherapy. In

94% of cases, healing occurs, and in 10%, recurrence. During the course of treatment, side effects are prevalent. Genital warts can be successfully healed by cryotherapy, which also lowers HPV virus concentration and eliminates the catalyst that promotes the growth of cancer.¹⁶



Figure 1: Dermoscopic picture of a common wart featuring dotted vessels located in the centre of the papillae (frog spawn).⁶



Figure 2: Macroscopic picture of common wart presenting as exophytic, hyperkeratotic, dome-shaped papules with a rough surface.



Figure 3: Dermoscopic picture of a flat wart revealing a yellowish background with delicate papillae and almost invisible dotted vessels.



Figure 4: The macroscopic picture of flat warts typically presents as numerous light browns slightly raised papules with a smooth surface.

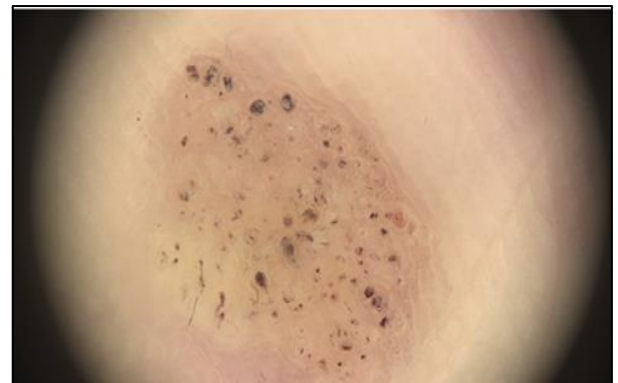


Figure 5: Dermoscopic picture of a plantar wart typically showing a papillomatous growth with brown to red dots and streaks that correspond to haemorrhages.



Figure 6: Macroscopic picture of mosaic type of plantar warts featuring superficial clusters of slightly raised and endophytically growing papules with a rough keratotic surface.

CONCLUSION

In conclusion, the human papillomavirus (HPV) is a highly prevalent virus responsible for various types of warts, both non-genital and genital, affecting individuals globally.

Common warts, flat warts, and plantar warts are the primary types of non-genital warts, each varying in appearance, location, and HPV strains involved. Genital warts, typically caused by HPV types 6 and 11, pose a significant public health concern due to their association with invasive cervical malignancies linked to HPV types 16 and 18. While many warts are self-limiting, treatment options are diverse, including topical agents such as imiquimod cream, photodynamic therapy, and chemical cautery. Advanced treatments like cryotherapy, surgical excision, and laser therapy are used for more extensive or resistant cases. The development of new therapeutic approaches highlights the ongoing efforts to manage HPV-related conditions effectively, aiming to reduce their spread and complications.

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