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A Prospective Study on Effectiveness of Autoinoculation in Treatment of Multiple Cutaneous Warts

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Conflict of interest: Nil

Abstract

Background: Cutaneous warts are common benign skin lesions caused by human papillomavirus (HPV). Traditional ablative treatments such as cryotherapy, radiofrequency, and laser offer limited success for multiple and recurrent warts due to high recurrence rates and lack of immune stimulation.

Aims & Objectives: To evaluate the efficacy and safety of autoinoculation as a therapeutic modality in the management of multiple cutaneous warts.

Materials & Methods: We conducted a prospective study on 40 patients with approximately five cutaneous warts who were attending the Dermatology OPD. We performed autoinoculation by harvesting a pared lesion under aseptic conditions, mincing it, and implanting the tissue into a dermal pocket on the left forearm. We followed up with the patients every 4 weeks for 12 weeks to assess the resolution of the wart.

Results: Out of 40 patients, 24 were male and 16 were female. The majority (75%) had warts persisting for more than 6 months. At 4 weeks, 60% showed 50–75% clearance, and 10% demonstrated >75% clearance. By week 12, 75% (28 patients) achieved complete clearance, 22.5% had partial clearance, and one patient showed no improvement. No adverse events were reported.

Conclusion: Autoinoculation is a safe, cost-effective, and immune-stimulating single-session therapy for treating multiple and recurrent cutaneous warts. Its minimally invasive nature and high clearance rates make it a promising alternative to conventional ablative methods.

Keywords: autoinoculation, cutaneous warts, HPV, immunotherapy, verruca vulgaris, palmoplantar warts

Introduction

Warts are benign proliferation of the skin and mucosa caused by various strains of human papilloma virus (HPV). They clinically manifest as common warts

(verruca vulgaris), filiform warts (digitate wart), flat warts (verruca plana), plantar warts, genital warts (condyloma accuminata), oral and laryngeal papillomas and epidermodysplasia verruciformis. Common modalities of treatment (electrocautery, cryotherapy, radiofrequency, laser) ablate the wart tissue but do not stimulate the immune system against the pathogen. These procedures are painful, cause scarring, secondary infection have high reoccurrence rates and impractical for treatment of multiple cutaneous warts. Hence for effective treatment of warts, stimulation of the immune system by exposing the virus to immune mediators forms an ideal modality of treatment, causing spontaneous regression of wart with long lasting immunity. Auto wart implantation is one such novel, single visit procedure which treat the warts by stimulation of immune response against the virus.

Aims & Objectives

To study the effectiveness and safety of autoinoculation as a treatment modality in multiple cutaneous warts

Materials & Methods

A Prospective observational Study was conducted from 1/4/24 to 30/9/24 (6months) with a total of 40 patients of either sex at department of DVL, OPD, Santhiram Medical College and General Hospital, Nandyal. Patients above 18 yrs who are presented with >5 warts, recurrent (warts which have recurred after any modality of treatment) and palmoplantar warts were enrolled in the study. Patients who are willing to give consent. Patients who are willing for follow up. Patients who are not willing to participate and give written informed consent.

Pregnancy and lactation, keloidal tendency, immunocompromised individuals (HIV) and patients on immunosuppressive drugs. Patients with multiple cutaneous warts over palms, soles and no response with systemic treatment were enrolled to study after taking informed consent. History and examination were recorded.

Procedure of Autoinoculation

Under aseptic precautions, donor tissue for auto graft was harvested by paring a well-developed verrucous lesion using a sterile surgical blade no.15 under local anesthesia by 2% lignocaine infiltration (fig:1 & 2).

Hemostasis was achieved with a radio-frequency monopolar probe in coagulation mode.

The wart tissue thus obtained was placed in a petri dish and minced into tiny bits (Fig:3). The site for engraftment was cleansed with spirit-povidone iodine spirit and infiltrated with about 0.5ml of lignocaine with adrenaline (1:2,00,000), (Fig:5).

Using a 20 gauge needle, a dermal pocket extending up to the subcutis was created over the volar aspect of the left forearm, 5 cm below the antecubital crease (Fig:6).

The minced bits of the donor were introduced deep into the subcutis using Adson's forceps or an insulin syringe used for infiltration (Fig:7).

Both donor and recipient sites were dressed with sterile medicated gauze and adhesive plaster (Micropore®) (Fig:8). Systemic and topical antibiotics (oral amoxicillin + clavulanic acid and topical mupirocin) were prescribed for 5 days.

Patients were advised not to wet or remove the plaster for 5 days after the procedure.

Patients were assessed every 4 weeks for 3 months. At each follow-up visit, lesion count and percentage reduction in number of warts were undertaken.

Resolution of all the warts within three months was considered as complete clearance. Patients were followed up for one more month after clearance for any recurrence.

Figure 1: local anesthesia by 2% lignocaine

Figure 2: paring by surgical blade no: 15

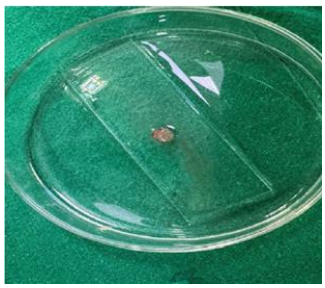


Figure 3: Wart tissue placed in petri dish.

Figure 4: Wart tissue minced into tiny bits.

Figure 5: Dermal pocket is infiltrated with about 0.5 ml of lignocaine with adrenaline

Figure 6: Using a 20 gauge needle, a dermal pocket is made over volar aspect of left forearm.

Figure 7: The minced tiny bits were introduced into dermal pocket.

Figure 8: Donor sites were dressed with sterile medicated gauze and adhesive plaster (Micropore®).

Results

All 40 patients were available for follow-up. In the present study males outnumbered females (M:F = 24:16) with commonest age of presentation being 24-28 years. Out of 40 patients, 21had verruca vulgaris and the remaining 19 had palmo-plantar warts. Majority of the patients (75%, 30 patients) had warts persisting for more than 6 months. At week 4 of post treatment evaluation, 60% (24 patients) had 50-75% clearance of warts and 10% (4 patients) had more than 75% clearance of warts. At week 12, total of 28 patients (75%) showed complete

clearance of warts, 9 patients (22.5%) had partial clearance and one patient showed no improvement. No apparent side effects were observed

Summary of Study Results

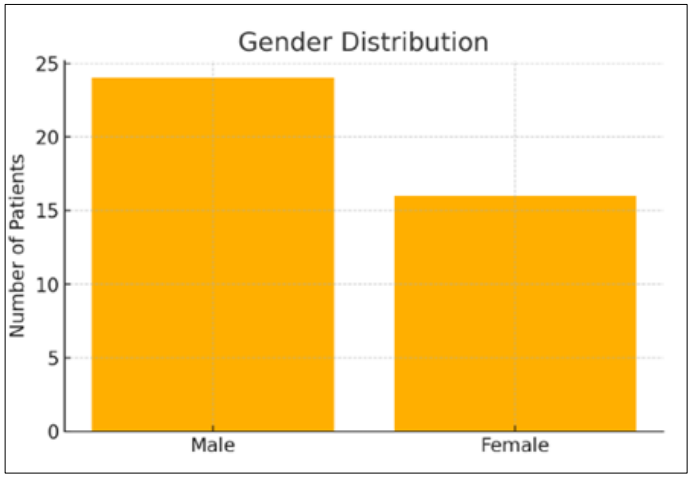
Table 1: Patient Demographics and Wart Types

Parameter	Number	Percentage
Total Patients	40	100%
Male	24	60%
Female	16	40%
Commonest Age Group	24-28 years	-
Verruca Vulgaris	21	52.5%
Palmo-plantar Warts	19	47.5%
Warts > 6 months	30	75%

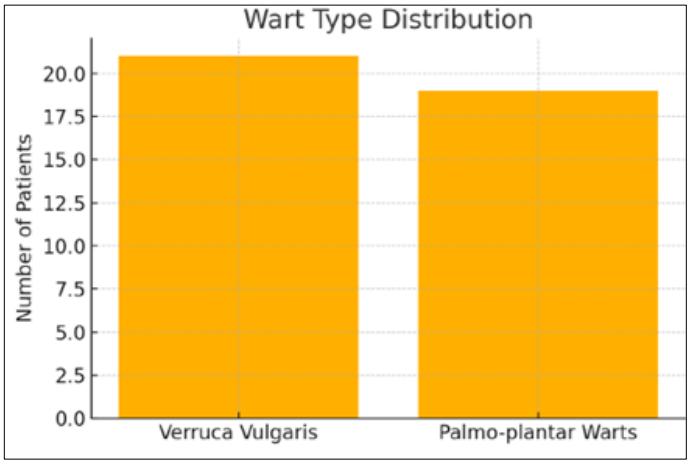
Table 2: Wart Clearance at Week 4 and Week 12

Outcome	Week 4 (n)	Week 4 (%)	Week 12 (n)	Week 12 (%)
50-75% Clearance	24	60	0	0.0
>75% Clearance	4	10	0	0.0
Complete Clearance	0	0	28	75.0
Partial Clearance	0	0	9	22.5
No Improvement	0	0	1	2.5

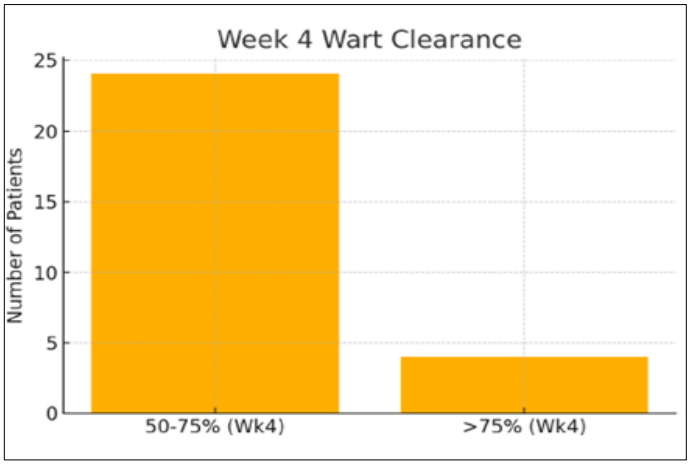
Graph 1: Gender Distribution



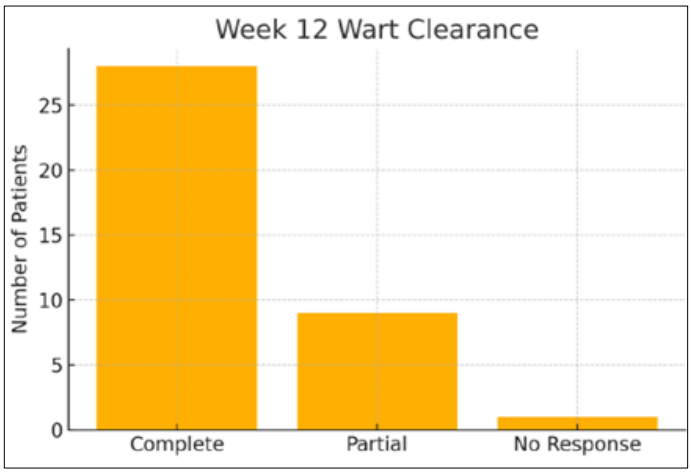
Graph 2: Wart Type Distribution



Graph 3: Week 4 Wart Clearance



Graph 4: Week 12 Wart Clearance



Before and After Autoinoculation

Discussion

Warts are benign epithelial proliferations caused by various strains of the human papillomavirus (HPV). Conventional therapies such as electrocautery, cryotherapy, radiofrequency ablation, and laser aim to destroy the lesion locally but often fail to address the underlying viral infection. These approaches do not stimulate the host's immune response, resulting in high rates of recurrence, especially in multiple, recalcitrant, or distant lesions.

Immunotherapy, particularly autoinoculation, is a promising modality that acts by enhancing systemic immunity against HPV. It involves introducing wart-derived viral antigens into the host to stimulate a delayed-type hypersensitivity (DTH) response. This systemic immune activation can lead to resolution not only of the inoculated wart but also of distant lesions.

The underlying mechanism is believed to involve a Th1-dominant immune response, where TNF-α and IL-1 inhibit viral gene transcription, while IFN-γ and IL-2 activate cytotoxic T lymphocytes and natural killer (NK) cells to destroy HPV-infected cells.

In our study, autoinoculation was carried out using a minimally invasive modification, where superficial paring of the wart was used to harvest tissue, avoiding deep excision and subsequent donor site morbidity. Since HPV is largely confined to the epidermis, this superficial method proved both effective and less traumatic.

Comparison with Other Studies

Srivastava et al. (2010) reported successful outcomes using autoinoculation, where a larger amount of wart tissue was excised and implanted into a dermal pocket. Though effective, this technique involved a more invasive approach, increasing the risk of donor site complications. In contrast, our technique avoided deep tissue excision while still achieving favorable outcomes, suggesting that epidermal antigen exposure alone may suffice to trigger an adequate immune response.

Gupta et al. (2015) demonstrated a clearance rate of 62% using autoinoculation in patients with multiple warts. They concluded that the technique was effective and safe, especially in recalcitrant cases. Our findings are consistent, showing a similarly high clearance rate, particularly in lesions resistant to other modalities.

Bhat et al. (2017) reported a complete clearance rate of 70% with autoinoculation, along with minimal side effects. They also noted resolution of distant warts, emphasizing the systemic effect of the immune activation, which we also observed in our study.

Nofal et al. (2013) compared autoinoculation with intralesional Candida antigen therapy and found both to be effective, but autoinoculation had fewer adverse reactions and was more acceptable to patients. Our findings further reinforce the tolerability and simplicity of autoinoculation as an outpatient procedure.

Chaudhary et al. (2019) utilized autoinoculation in recalcitrant palmoplantar warts and noted a 68%

complete resolution. Interestingly, they emphasized the cost-effectiveness of the technique, a point that aligns with our findings, especially in low-resource settings.

Conclusion

Autoinoculation is a simple, cost-effective, and minimally invasive technique that leverages the body's immune system to fight HPV. Our modification—using superficial paring rather than excision—minimizes trauma while maintaining efficacy. When compared to other studies, our results reinforce the growing body of evidence supporting autoinoculation as a valuable tool in the management of multiple and recalcitrant warts.

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