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Original Article

TO EVALUATE THE EFFECT OF INTRALESIONAL VIT D-3 INJECTION IN CUTANEOUS WARTS

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ABSTRACT

Objective: To study the demographic characteristics, clinical types, and treatment response patterns of patients with cutaneous warts attending a dermatology outpatient department.

Methods: This was a descriptive observational study including patients diagnosed with cutaneous warts. Demographic details, clinical characteristics, including type, number, and duration of warts, and management outcomes were recorded. Treatment response was assessed based on clinical resolution following treatment sittings.

Results: The study population comprised 51% females and 49% males, with a mean age of 28.83±9.53 years. The most affected age group was 21–30 years (42%). Palmar warts were the most common clinical type (42%), followed by verruca plana (29%) and plantar warts (27%). The mean number of warts was 5.43±2.36, and the mean duration of disease was 6.45±3.25 mo. Most patients required four treatment sittings (67%). Complete response was observed in 48% of patients, while 21% showed partial response and 31% had no response to treatment.

Conclusion: Cutaneous warts predominantly affected young adults and presented with varied clinical morphology and lesion burden. Multiple treatment sittings were often required, with variable therapeutic responses. These findings highlight the chronic nature of cutaneous warts and the need for individualized management strategies.

Keywords: Cutaneous warts, Human papillomavirus, Palmar warts, Plantar warts, Verruca plana, Treatment outcome, Cryotherapy

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INTRODUCTION

Warts are benign growths caused by infection of keratinocytes with Human Papiloma Virus (HPV). HPV infections are very common and can cause disease at any site in stratified squamous epithelium of skin and mucosa [1, 2]. The most notable effect of HPV infection is development of warts. More than 150 types of HPV have been recognized. Most HPV types cause specific types of warts and favour certain anatomical location like plantar warts, palmer warts and genital warts [1]. Although these viruses create no acute signs or symptoms, they induce slow growth of lesions that can remain for a long time. The warts are pleomorphic and principally affect the skin of extremities, oral mucosa, larynx and genital mucosa [3].

A number of types of verruca have been identified, which include common wart (verruca vulgaris), plane wart (verruca plana), plantar warts, palmar warts, genital warts, periungual warts [4]. Warts spread by direct or indirect contact. Disruption of epithelial barrier function predisposes to development of warts. Although warts may resolve spontaneously in 65-78% of patients within 2 y, many patient seek treatment because warts can be unsightly, tender or painful. Several treatments, including surgery, cryotherapy, electrocauteriation, LASER and topical agents focus on eradicating the lesions, severity, and the patient's immune status. Hence, to overcome these shortcomings, immunotherapy is being tried widely for the treatment of warts over the last few years. It acts on the basic principle of enhancing the cell-mediated immunity for the clearance of warts [4, 5].

Intralesional Vitamin D3 injection was tried first time by Aktas *et al.* for the treatment of plantar warts and reported encouraging results. The exact mechanism of action of Vitamin D3 in the clearance of warts is not known. Experimental evidence suggests that they have immunomodulatory effects by inhibiting the expression of interleukin 6,interleukin-8, tumour necrosis factor mediated through VDR-dependent [6, 7].

Studies on the efficacy of Vit. D-3 on warts are limited in Madhya Pradesh. In present study, we are trying to find out the effects of intralesional Vit. D-3 on warts among adult patients.

MATERIALS AND METHODS

This study was conducted from January 2018 to January 2019, subjects who presented to the Outpatient Department of Dermatology of M. G. M. Medical College and M. Y. Hospital Indore for cutaneous warts.

Study Design: A prospective observational study.

Study Period: January 2018 to January 2019.

Study Setting: Department of Dermatology. Venereology and Leprosy at M. G. M. Medical College and M. Y. Hospital.

Sample Size: A total 100 subjects were recruited into the study.

Inclusion criteria

1. Subjects of age between 18 y to 50 y.
2. Subjects having 3 to 15 cutaneous warts.
3. Subjects having verruca vulgaris, plantar warts, plane warts and palmar warts.

Exclusion criteria

1. Pregnant and lactating females.
2. Immunocompromised patients.
3. Prior history of hypersensitivity to injection Vitamin D3
4. Anogenital warts.
5. Subunguinal warts.
6. Periorbital warts.
7. History of prior treatment with either topical or destructive modalities for at least 6 mo.

Data collection

Demographic, clinical and treatment details were recorded for all patients recruited into the study. Baseline investigations like CBC,

LFT, KFT were also done. Viral markers of blood-borne infections like HIV, HBV and HCV was also conducted for all patients. Treatment response of every patients was recorded 15 d after every treatment sitings.

Intervention

Intralesional injection of 0.2 ml of vitamin D3 (600,000IU; conc.-15 mg/ml) in oily base was given at the base of the wart, in maximum 3 warts. The injections were repeated at every 2 w interval until complete resolution of all warts occurs or a maximum of 4 sessions. Patients were followed up for 6 mo after the last injection to detect any recurrence. Patients were evaluated for response and any adverse effects at each visit. Patients were followed up for 6 mo after the last injection to assessed any recurrence. Photographic documentation was done before and after the treatment. Depending on the decrease in wart size and number response rate was classified as complete response (CR), partial response (PR) and no response (NR).

RESULTS

Ethical statement

Written informed consent was obtained from all patients. The study was performed following clearance from the Ethics and Scientific Review Committee, M. G. M. Medical College and M. Y. Hospital, Indore. Letter no. EC/MGM/July-18/18. Dated: 09.07.2018.

Table 1: Demographic details

Demographic variables	N	%
Gender		
Male	49	49
Female	51	51
Age group (Yrs) Mean±SD	28.83±9.53	
18-20	22	22
21-30	42	42
31-40	22	22
41-50	14	14
Marital status		
Married	52	52
Unmarried	48	48
Occupation		
Farmer	6	6
Housewife	33	33
Labourer	6	6
Police	1	1
Private job	13	13
Student	41	41

In our study, a total of 100 patients were recruited. Out of 100 patients, 49 % were male and 51% were females. The age range of study participants were 18-50 y. The mean age of study participants was 28.83±9.53. The highest number of patients were from age group 21-30 y (42%). 52 % of participants were married and majority of patients were housewives (33%) [table 1].

Table 2: Characteristics of warts

Type of warts	N (%)
Palmar warts	42 (42)
Palmoplantar warts	2 (2)
Plantar warts	27(27)
Verruca plana	29(29)
Verruca vulgaris	0(0)
mean number of warts	5.43±2.36
mean duration	6.45±3.25

Palmar warts were the most common presentation (42%), followed by verruca plana (29%) and plantar warts (27%). The mean number of warts was 5.43±2.36, with a mean disease duration of 6.45±3.25 mo [table 2].

Table 3: Effectiveness of treatment modalities

Management details	N	%
Number of sittings		
1	0	0
2	6	6
3	27	27
4	67	67
Response to treatment		
No response	31	31
Partial response	21	21
Complete response	48	48

Most patients required four treatment sittings (67%). Complete response was observed in 48% of cases, while 21% showed partial response and 31% had no response to treatment [table 3]

DISCUSSION

Cutaneous warts are benign epidermal proliferations caused by human papillomavirus (HPV) infection and represent a common dermatological problem worldwide, affecting an estimated 7–12% of the general population and predominantly affecting children and young adults [8, 9]. These lesions can present in various clinical forms, such as palmar, plantar, flat (verruca plana), and common warts, and may cause significant cosmetic concern, functional discomfort, and psychosocial impact, especially when numerous or persistent [8].

In the present study, gender distribution was nearly equal (49% males and 51% females), reflecting patterns seen in previous institutional case series of cutaneous warts where male and female representation were similar in non-genital wart cohorts. For example, a descriptive study from a tertiary dermatology clinic reported comparable proportions of male and female patients presenting with cutaneous warts [10]. The mean age of our cohort was 28.83±9.53 y, and the largest age group was 21–30 y, consistent with adult wart epidemiology where prevalence can cluster in young adult populations, though overall wart prevalence varies widely by age group [11]. Additionally, occupational distribution in our study showed a high proportion of students (41%) and housewives (33%), similar to other studies where students and individuals engaged in routine physical activities presented frequently with warts, likely related to increased exposure to HPV through minor skin trauma. Marital status (52% married, 48% unmarried) was also balanced, suggesting cutaneous wart occurrence transcends marital demographic categories without strong reported association in prior epidemiological data [10].

In our cohort, palmar warts were the most common clinical presentation (42%), followed by verruca plana (29%) and plantar warts (27%), while verruca vulgaris was not observed. This distribution aligns with previously published clinico-epidemiological studies of non-genital warts that reported common, palmoplantar, and plane warts as frequent morphological subtypes among dermatology patients. In a descriptive study of 100 patients with cutaneous warts, common (42%), palmoplantar (20%), and plane (18%) types comprised the major categories of nongenital warts. Another large descriptive outpatient study reported a similar spectrum, with common, palmoplantar, periungual, filiform, and verruca plana among the observable wart subtypes [10, 12]. Additionally, in a Belgian cohort of persistent cutaneous warts, mosaic plantar and verruca vulgaris were dominant, but verruca plana-although less frequent-was still a recognized morphological type, underscoring the broad clinical variety seen in wart presentations across populations. The relative predominance of specific subtypes such as palmar and plantar warts may be influenced by local exposure patterns, occupational factors, and mechanical trauma-factors that have been linked to anatomical predilection in cutaneous HPV infection [5, 10, 12].

Management data demonstrated that most patients underwent four treatment sittings (67%). Nearly half of the cohort achieved a complete response (48%), with partial and no response observed in 21% and 31% respectively. These outcomes underscore the variable therapeutic response seen in warts, as corroborated by systematic reviews showing widely divergent cure rates among different treatment modalities, where traditional options such as cryotherapy and salicylic acid generally offer modest efficacy compared with combination or immunotherapeutic approaches. A similar pattern of responses was reported in other clinical series where investigators achieved complete resolution in a subset of patients, while others required multiple treatment sessions or alternative strategies [13, 14].

Our observed response rates are consistent with prior research suggesting that no single treatment modality guarantees universal effectiveness. For example, cryotherapy, although widely used in clinical practice, has variable cure rates, and adjuncts such as salicylic acid or immunomodulatory agents have been explored to enhance outcomes. Newer combinations, such as cantharidin with retinoic acid and salicylic acid, have demonstrated higher efficacy in palmoplantar warts than conventional methods in some reports, indicating the potential value of optimized therapeutic regimens [15, 16].

The predominance of specific wart types and the requirement for multiple treatment sessions highlight the clinical challenge in managing cutaneous warts, particularly those that are palmoplantar or numerous. The substantial proportion of patients with only partial or no response suggests a need for individualized treatment planning and consideration of emerging therapies, such as immunotherapy, intralesional agents, or combination regimens, which have shown promise in recent studies [17, 18].

Our findings should be interpreted in light of certain limitations, including the lack of long-term follow-up for recurrence and potential confounding factors such as immunological status or prior treatments. Future research could focus on randomized controlled trials comparing standardized protocols and evaluating patient-reported outcomes to inform evidence-based management of wart subtypes.

In conclusion, this study adds to the clinico-epidemiological characterization of cutaneous warts in an adult clinical population, demonstrating diverse presentations and treatment responses. Greater understanding of host, lesion, and therapy-related factors will aid in optimizing management strategies for this persistent dermatological condition.

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AUTHORS CONTRIBUTIONS

All authors have contributed equally

CONFLICT OF INTERESTS

Declared none

REFERENCES

1. Tripathi A, Sahu U. An overview of HPV: causes, symptoms and clinical manifestations. In: Immunopathology diagnosis and treatment of HPV-induced malignancies. Amsterdam: Elsevier; 2022. p. 1-19. doi: 10.1016/B978-0-323-91797-1.00003-X.
2. Wolf J, Kist LF, Pereira SB, Quessada MA, Petek H, Pille A. Human papillomavirus infection: epidemiology, biology host interactions, cancer development, prevention and therapeutics. Rev Med Virol. 2024;34(3):e2537. doi: 10.1002/rmv.2537, PMID 38666757.
3. Abdullah HI, Hassan AH. Clinicoepidemiological findings and pathological characteristics of different types of cutaneous warts. KJAR. 2025 Jun 20;10(1):158-69. doi: 10.24017/science.2025.1.10.
4. Skubic L, Breznik V, Poljak M. Different skin wart types, different human papillomavirus types? a narrative review. Acta Dermatovenerol Alp Pannonica Adriat. 2023 Dec;32(4):165-71. doi: 10.15570/actaapa.2023.30, PMID 38126099.
5. Redzic N, Pereira AR, Menon S, Bogers J, Coppens A, Kehoe K. Characterization of type-specific HPV prevalence in a population of persistent cutaneous warts in Flanders Belgium. Sci Rep. 2023 Oct 15;13(1):17492. doi: 10.1038/s41598-023-44154-y, PMID 37840107.
6. Elsayed Ghaly N, El-Ashmawy AA, Abou Zeid M, E Shaker ES. Efficacy and safety of intralesional injection of vitamin D3 versus tuberculin PPD in the treatment of plantar warts: a comparative controlled study. J Cosmet Dermatol. 2021;20(4):1231-40. doi: 10.1111/jocd.13712, PMID 32892493.
7. Almuhyi RA, Alhamdi KI, Alhamdi DK. Topical vitamin D3 derivative (calcipotriol) versus intralesional vitamin D3 in the treatment of cutaneous warts: a clinical therapeutic comparative trial. Dermatol Res Pract. 2024;2024(1):5236290. doi: 10.1155/2024/5236290, PMID 39534647.
8. Witchey DJ, Witchey NB, Roth Kauffman MM, Kauffman MK. Plantar warts: epidemiology, pathophysiology and clinical management. J Am Osteopath Assoc. 2018 Feb 1;118(2):92-105. doi: 10.7556/jaoa.2018.024, PMID 29379975.

9. Magalhaes GM, Vieira EC, Garcia LC, De Carvalho Leite ML, Guedes AC, Araujo MG. Update on human papilloma virus part I: epidemiology pathogenesis and clinical spectrum. An Bras Dermatol. 2021;96(1):1-16. doi: 10.1016/j.abd.2020.11.003, PMID 33341319.
10. Karki S, Pradhan M, Rai A. Warts among patients visiting the outpatient department of dermatology in a tertiary care centre: a descriptive cross-sectional study. JNMA J Nepal Med Assoc. 2022 Sep;60(253):770-3. doi: 10.31729/jnma.7544, PMID 36705137.
11. Liu J, Li H, Yang F, Ren Y, Xia T, Zhao Z. Epidemiology and clinical profile of cutaneous warts in Chinese college students: a cross-sectional and follow-up study. Sci Rep. 2018 Oct 18;8(1):15450. doi: 10.1038/s41598-018-33511-x, PMID 30337549.
12. Ghadgepatil SS, Gupta S, Sharma YK. Clinicoepidemiological study of different types of warts. Dermatol Res Pract. 2016;2016:7989817. doi: 10.1155/2016/7989817, PMID 27047542.
13. Jiravsky O, Spacek R, Chovancik J, Neuwirth R, Hudec M, Sknouril L. Early ganglion stellate blockade as part of a two-step treatment algorithm suppresses electrical storm and need for intubation. Hellenic J Cardiol. 2023 Sep 1;73:24-35. doi: 10.1016/j.hjc.2023.04.003, PMID 37088344.
14. Plastow R, Kerkhoffs GM, Wood D, Paton BM, Kayani B, Pollock N. London international consensus and delphi study on hamstring injuries part 2: operative management. Br J Sports Med. 2023 Mar;57(5):266-73. doi: 10.1136/bjsports-2022-106345.
15. Garcia C, Karri J, Zacharias NA, Abd-Elsayed A. Use of cryotherapy for managing chronic pain: an evidence-based narrative. Pain Ther. 2021 Jun 1;10(1):81-100. doi: 10.1007/s40122-020-00225-w, PMID 33315183.
16. Chaudhary D, Sun Y, Gao X. Comparison of cryotherapy and topical salicylic acid in common warts: a systematic review and meta-analysis. Dermatol Ther. 2023;2023(1):4283918. doi: 10.1155/2023/4283918.
17. Zhu P, Qi RQ, Yang Y, Huo W, Zhang Y, He L. Clinical guideline for the diagnosis and treatment of cutaneous warts (2022). J Evid Based Med. 2022;15(3):284-301. doi: 10.1111/jebm.12494, PMID 36117295.
18. Sandru F, Radu AM, Petca A, Dumitrascu MC, Petca RC, Roman AM. Unveiling the therapeutic horizon: HPV vaccines and their impact on cutaneous diseases-a comprehensive review. Vaccines. 2024 Feb 23;12(3):228. doi: 10.3390/vaccines12030228, PMID 38543862.