

Effect of Topical Application of Tea Tree Oil (*Melaleuca alternifolia*) on Hand Warts

B DEENADAYALAN¹, V VENUGOPAL², K MAHESHKUMAR³, A AKILA⁴, C YOGA PRIYA⁵

ABSTRACT

Tea Tree Oil (TTO) is one of the most widely used aroma oil and is documented to be beneficial in the management of viral infections such as Herpes Simplex Virus (HSV) and Human Papilloma Virus (HPV). Hereby, authors report a case of 22-year-old female diagnosed with HPV infection with cutaneous wart (*Verruca Vulgaris*) on distal phalange of the right index and middle fingers. She had complained of pain and discomfort while writing. Tea tree oil was mixed with carrier oil (coconut oil) in a ratio of 1:5, and she was advised to apply it over the wart directly for 21 days. At the completion of 21 days, the warts resolved completely and there was no recurrence during the one month follow-up after intervention. In addition, the patient also reported a reduction in pain with the treatment. Tea tree oil could thus be effectively used for treating cutaneous warts. However, further studies with adequate sample size would help further validate the findings.

Keywords: Aromatherapy, Naturopathy, *Verruca vulgaris*

CASE REPORT

A 22-year-old female patient visited the Outpatient Department with chief complaints of pain and discomfort while writing and doing routine activities. Previously, she was diagnosed with Human Papilloma Virus (HPV) infection and verruca vulgaris (viral warts) on the distal phalanges of the index and middle finger (right hand) by a Dermatologist. Unhappy with the conventional topical medication, she tried ayurvedic medication for two months (YRG-classic yograj guggul tablets) and discontinued the treatment due to dissatisfaction with the outcome.

On inspection, the warts appeared round, rough with irregular surface lesion, located at the centre of the distal phalange of the index and middle fingers. There were no other warts found on her body. The intervention procedure and the mode of application of Tea Tree Oil (TTO) were explained before starting the treatment. Tea tree oil (Aroma Treasures Pvt., Ltd., Mumbai, India) was mixed with carrier oil (coconut oil) in the ratio of 1:5, and applied directly over the wart with a cotton ball once a day for a week. Initially, the patient reported pain aggravation by the end of first week. Therefore, after seven days, the frequency of topical application was reduced to every alternate day.

The status of warts was captured on a daily basis throughout the treatment period of 21 days and to check the reoccurrence, follow-up was carried out for a month. After 21 days of application of TTO, there was complete clearance of wart with absence of pain and scar formation [Table/Fig-1]. There was no recurrence at the end of one month follow-up as well.

DISCUSSION

Common warts or verruca are hyperkeratotic viral lesions of the skin caused by the HPV which is a non enveloped, double-stranded, circular Deoxyribonucleic Acid (DNA) virus of the *papillomaviridae* family [1]. More than 100 types of HPV have been identified and the morphologic lesion produced by each of these HPV varies [2]. In the general population, 7-12% are affected by cutaneous viral warts [3]. There are many contributing factors such as hygiene, stress, and poor lifestyle that could aggravate the condition. Conventional



[Table/Fig-1]: Clinical image at various time intervals before and after application of tea tree oil.

treatments for the lesion include cauterisation with salicylic acid, podophyllotoxin, trichloroacetic acid, formaldehyde, 5-fluorouracil, and photodynamic therapy. Procedures like cryosurgery, laser ablation, electrocautery, and surgical excision are painful and lead to scar formation with higher possibilities for reoccurrence [4].

Aromatherapy [5] is one of the most Common Complementary and Alternative Therapy (CAM), widely used among the naturopathy [6] physicians in India. Tea tree oil is an essential oil extracted from the Australian plant *Melaleuca alternifolia* and is being used for the management of viral infection. An in-vitro study showed the virucidal effect of TTO against herpes simplex virus 1 and 2 which is a double-stranded DNA virus similar to HPV [7]. The antiviral property of TTO has been well-documented and has been successfully used in the treatment of cutaneous warts in children [Table/Fig-2] [8,9]. The current case report describes the therapeutic effects of TTO application on cutaneous warts in an adult female patient.

Author (Year)	Country	Study design	Age and sex	Site of warts	Treatment with duration	Conclusion
Millar BC and Jem A, 2008, [8]	United Kingdom	Case report	7 years, female	Distal phalanges of the right middle finger	Topical application once daily for 12 days	Complete clearance of warts
Alsanad SM and Alkhamees OA, 2016 [9]	Saudi Arabia	Case report	14 years, male	Proximal phalanges of the right little finger	Topical application twice a day for 10 days	Complete clearance of warts
			9 years, male	Sole of left foot	Topical application twice a day for 20 days	Complete clearance of warts
Present study (2021)	India	Case report	22 years, female	Distal phalanges	Topical application once a day for 7 days afterwards alternative for 14 days	Complete clearance of warts

[Table/Fig-2]: Previous case reports with tea tree oil in children for the management of warts [8,9].

Terpinene-4-ol and α -terpineol in TTO are known for its antiviral property and has the potency to inhibit viral replication in both enveloped and non enveloped viruses [10]. Terpinene-4-ol has been shown to inhibit the synthesis of proinflammatory cytokines, Tumour Necrosis Factor (TNF), Interleukin-1 (IL-1), IL-8, and prostaglandin E2 while increasing the anti-inflammatory cytokines (IL-10 and IL-4). These anti-inflammatory cytokines would increase the monocyte recruitment for clearing the cell debris and preventing further growth of the inflamed cells which leads to reversion or resolution of inflammation [11]. Tea tree oil water-soluble components, terpinen-4-ol and α -terpineol, also inhibit monocyte superoxide generation [12]. It has also been proven to control wheal and flare by lowering histamine-induced edema, which is common in allergic acute hypersensitivities. The underlying mechanism of HPV infection clearance is elusive. Human papillomavirus persistence is assumed to need a favourable local immune response, which favours virus evasion or suppresses innate and adaptive immune responses. It is believed that the innate immune response plays a vital role early in the healing process of HPV infection [13].

The wart was present in the dominant hand of the index patient, making it difficult for her to perform her regular everyday activities including holding pen for writing. The location of the wart has more significance for the patient as she was preparing for a nationwide competitive written examination. The benefits of removal of warts thus not only had cosmetic or aesthetic value, but it had also enabled the person to carry out her essential activities without any discomfort.

CONCLUSION(S)

Tea tree oil application could be a very simple and effective CAM therapy for the removal of warts caused due to HPV infection. The safety and ease of application makes it a more viable means to

treat warts. Further experimental studies with adequate sample size might be required to substantiate the findings.

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PARTICULARS OF CONTRIBUTORS:

1. PG Scholar, Department of Naturopathy, Government Yoga and Naturopathy Medical College and Hospital, Dr. MGR Medical University, Chennai, Tamil Nadu, India.
2. Assistant Medical Office/Lecture Grade II, Department of Yoga, Government Yoga and Naturopathy Medical College and Hospital, Dr. MGR Medical University, Chennai, Tamil Nadu, India.
3. Assistant Medical Office/Lecture Grade II, Department of Physiology, Government Yoga and Naturopathy Medical College and Hospital, Dr. MGR Medical University, Chennai, Tamil Nadu, India.
4. PG Scholar, Department of Acupuncture and Energy Medicine, Government Yoga and Naturopathy Medical College and Hospital, Dr. MGR Medical University, Chennai, Tamil Nadu, India.
5. PG Scholar, Department of Naturopathy, Government Yoga and Naturopathy Medical College and Hospital, Dr. MGR Medical University, Chennai, Tamil Nadu, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. K Maheshkumar,
Assistant Medical Office/Lecture Grade II, Department of Physiology, Government Yoga and Naturopathy Medical College and Hospital, Dr. MGR Medical University, Porur, Chennai-600106, Tamil Nadu, India.
E-mail: doctor.mahesh1985@gmail.com

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