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Wart Treatment Redefined: A Comparative Study Of *Agnikarma* And Laser Therapy

Dr. Amar Kadav[1]*, Dr. Sheetal Asutkar[2], Dr. Yogesh Yadav[3], Dr Shubham Patil[4], Triveni Dilip Patil[5]

[1]PG Scholar, Department of Shalya Tantra, Mahatma Gandhi Ayurved college Hospital and Research Centre, Datta Meghe Institute of Higher Education and Research (Deemed to be University) Salod(H), Wardha, Maharashtra, India Email–amarkadav15@gmail.com
[2]Professor & HOD, Department of Shalya Tantra, Mahatma Gandhi Ayurved College & Hospital And Research Centre, Datta Meghe Institute of Higher Education and Research (Deemed To Be University)Salod (H), Wardha, Maharashtra, India.Email:sheetalasutkar16@gmail.com
[3]PG Scholar, Department of Shalya Tantra, Mahatma Gandhi Ayurved college Hospital and Research Centre, Datta Meghe Institute of Higher Education and Research (Deemed to be University) Salod(H), Wardha, Maharashtra, India Email–dryogeshyadav00@gmail.com
[4]PG Scholar, Department of Shalya Tantra, Mahatma Gandhi Ayurved college Hospital and Research Centre, Datta Meghe Institute of Higher Education and Research (Deemed to be University) Salod(H), Wardha, Maharashtra, India Email– shubhpatil348@gmail.com
[5]Undergraduate student, Mahatma Gandhi Ayurved college Hospital and Research Centre, Datta Meghe Institute of Higher Education and Research (Deemed to be University) Salod(H),
Wardha, Maharashtra, India Email: doctrivenipatil@gmail.com

***Corresponding Author -** Dr. Amar Kadav
*PG Scholar, Department of ShalyaTantra, Mahatma Gandhi Ayurved college Hospital andResearch Centre, DattaMeghe Institute of Higher Education and Research (Deemed to be University)Salod(H), Wardha, Maharashtra, India, Email–amarkadav15@gmail.com

ABSTRACT

Warts are raised skin lesions caused by an infection with the Human Papillomavirus (HPV). They are benign growths that typically appear on the skin's surface and can occur on various parts of the body, most commonly on the hands and feet. This article aims to provide a comprehensive understanding of warts, including their causes, modes of transmission, and various types. The focus will also be on two treatment options: laser therapy and the ancient practice of ***Agnikarma***. Understanding how these treatments work is crucial for the effective management of warts. Recent research has demonstrated that both laser therapy and *Agnikarma* are successful in removing warts while significantly reducing the likelihood of recurrence. Laser therapy employs concentrated light energy to target and destroy the affected tissue, resulting in the wart's complete removal. In contrast, Agnikarma uses heated metallic instruments to induce a controlled thermal injury, effectively eliminating warts. By comparing these two methods, this study highlights their respective strengths and potential advantages in different clinical scenarios. This exploration of the mechanisms and outcomes of laser therapy and Agnikarma provides valuable insights for healthcare professionals and individuals seeking effective strategies to treat warts while minimizing the risk of recurrence.

Keywords: Human Papilloma Virus (HPV), *Agnikarma*, Nd;YAG lasers, *Samyak Dagdha*, *Shalaka*

INTRODUCTION

Warts are raised skin lesions caused by an infection with the Human Papillomavirus (HPV). These small, benign growths have been a part of human history for thousands of years. They were mentioned by Shakespeare in his works and even discovered on a 3,000-year-old mummy, underscoring their long-standing presence across civilizations. When the skin becomes infected with one of the many strains of HPV, it prompts an overgrowth of cells in the epidermis. This leads to the thickening and hardening of the outer layer of the skin in the affected area, resulting in the formation of warts. Although warts can develop on any part of the body, they are more commonly seen on the hands and feet. The appearance, texture, and location of warts vary, and these factors determine their classification into types such as common warts, plantar warts, flat warts, and genital warts, among others. Warts are typically noncancerous and do not pose a significant health threat. However, they can be a source of discomfort, both physically and emotionally. They may cause embarrassment due to their visible nature, particularly when located on exposed areas like the hands or face. Warts can also be contagious, spreading through direct contact or by sharing personal items, making them a concern for hygiene and public health. [1]

Etiology- Not everyone who comes into contact with the Human Papillomavirus (HPV) will develop warts, as the body's immune response varies from person to person. Some individuals may effectively combat the virus upon exposure, while others may develop warts due to a weaker or less effective immune defense. The likelihood of HPV infection increases when the skin barrier is compromised. Cuts, scrapes, or other injuries to the skin create entry points for the virus, making it easier to spread and establish an infection. For this reason, warts are more commonly seen in areas prone to minor trauma, such as the hands and feet.
Certain factors can further increase susceptibility to warts. Individuals with chronic skin conditions, such as eczema, are more vulnerable because their skin is often irritated or damaged, providing an ideal environment for the virus. Similarly, habits like nail-biting or picking at the skin can also increase the risk, as they cause microtears that facilitate viral entry. Understanding the etiology of warts helps highlight the importance of maintaining a healthy immune system and protecting the skin barrier to prevent the spread of HPV and the development of warts.[2]

Pathophysiology- Warts are caused by the Human Papillomavirus (HPV), spreading through direct skin-to-skin contact or indirectly via contaminated objects like towels or razors. They are more likely to develop on damaged or moist skin, which facilitates the virus's entry. Once inside, HPV infects keratinocytes in the epidermis, causing abnormal cell growth and leading to the characteristic thickened skin. The virus thrives in conditions like minor skin trauma or moisture, making warts highly contagious and prone to spreading both on the body and to others.[2]
Types: Warts can be categorized into several types based on their location and appearance: [3]
1. **Mosaic Warts**: These are clusters of tightly grouped warts that resemble a mosaic pattern, commonly found on the soles of the feet. They are more superficial compared to other types and can be resistant to treatment.
2. **Plantar Warts**:
   - **Mosaic-Type Plantar Warts**: Spread out and form clusters on weight-bearing areas of the feet.
   - **Myrmecial-Type Plantar Warts**: Deeper, painful, and can cause discomfort when walking or standing.
3. **Flat Warts (Verruca Plana)**: Smooth, flat-topped, and smaller than other warts, often appearing in clusters. They are commonly found on the face, back of the hands, or legs and are more frequent in children and young adults.
4. **Filiform Warts**: Characterized by finger-like projections, these warts are typically found on the face, around the mouth, eyes, or nose, and are more common in individuals with compromised immunity.
5. **Periungual Warts**: Found around or under fingernails and toenails, these warts can cause discomfort, nail deformity, or difficulty with nail growth.

AGNIKARMA
Agnikarma is a therapeutic practice that utilizes specific materials and techniques to treat various medical conditions. The tools used in *Agnikarma* procedures include a marker called *Agnikarmashalaka*, a gas stove, surgical spirit, gloves, cotton gauze, and substances such as *Madhu*, *Sarpi* (ghee), *Haridrachurna* (turmeric powder), and *Aloe Vera* pulp [4].
This therapeutic approach is employed to address a wide range of conditions, including heel spurs (heel pain), Achilles tendon pain, arthritis, degenerative joint disease, lower back pain, sciatica, neck pain, knee pain, tennis elbow, golfers' elbow (medial epicondylitis), chronic pain from fractures, migraine headaches, frozen shoulder (adhesive capsulitis), and carpal tunnel syndrome [5].
The process of *Agnikarma* involves several steps and utilizes the properties of heat to activate the fire element, referred to as *Dhatwagni*. This activation aids in the digestion of matter (*Aam*), promoting proper digestion and leading to a state of *Niramavastha*. Additionally, the procedure helps to balance both *Vata Dosha* and *Kapha Dosha* [6].
Agnikarma is a practice that applies specific materials and techniques to treat various medical conditions. The tools used in *Agnikarma* procedures include a marker called *AgnikarmaShalaka*, a gas stove, with a surgical spirit, gloves, cotton gauze and substances like *Madhu, Sarpi* (*ghee*) *haridrachurna* (turmeric powder) and aloe vera pulp [5].
This therapeutic approach is used for a range of conditions such as spur (heel pain) Achilles tendon pain, arthritis, degenerative joint disease, lower back pain, sciatica, neck pain, knee pain, tennis elbow injury, Golfers elbow (medial epicondylitis) chronic pain from fractures, migraines headaches,frozen shoulder (adhesive capsulitis) and carpal tunnel syndrome [7].
The process of *Agnikarma* involves steps. It utilizes the properties of heat to activate the fire called *Dhatwagni* and helps in the digestion of matter (*aam*) to achieve proper digestion (Niramavastha). This procedure helps balance both vata dosha and kaphadosha [4].
Fire (*agni*) plays a role in *Agnikarma* as it possesses qualities, like heat (*ushna*) sharpness (*tikshna*) subtlety (*sukshma*) and quick action (*ashukari*). These qualities counteract the imbalances of *vata dosha* and *kaphadosha*.The method known as *Samyak Dagdha Vrana* utilizes the transfer of healing warmth, from a rod called *Shalaka* to the skin tissue following three pathways.

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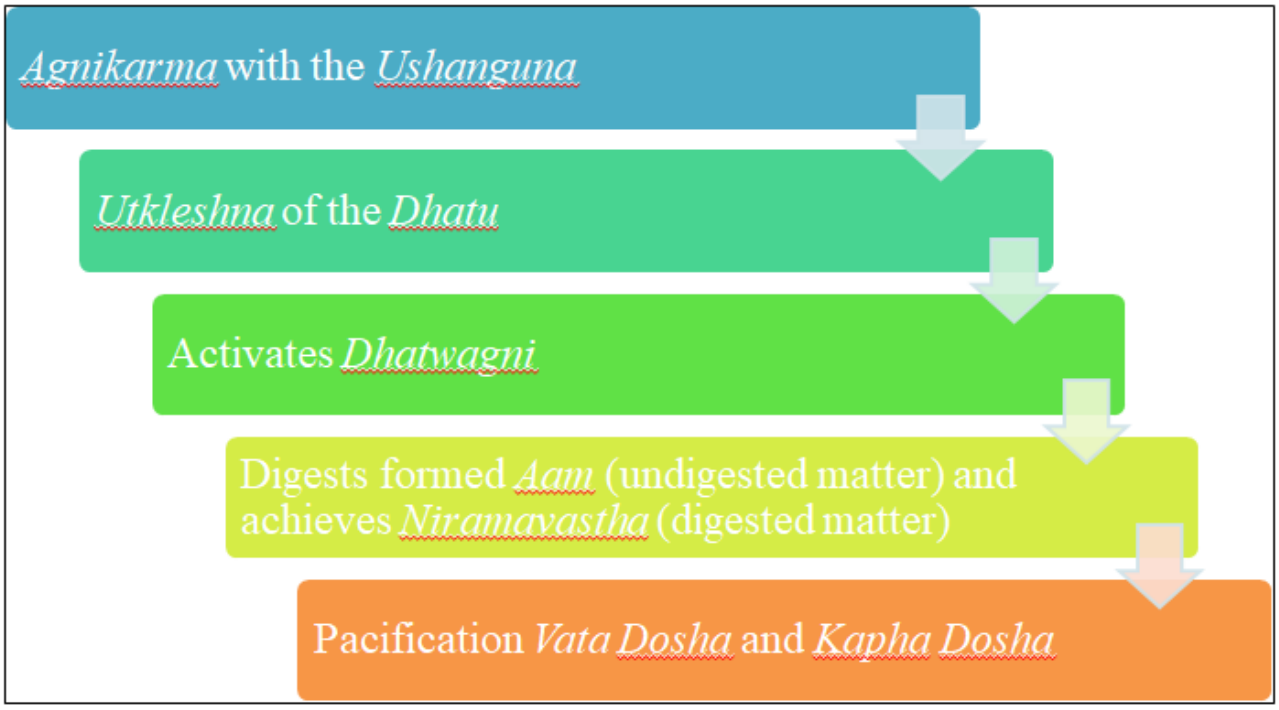

Fig :1 Mode of Action of *Agnikarma*

Firstly it works to clear *Srotovarodha* by balancing the *ushna, tikshna, sukshma* and *Ashukari* qualities while maintaining a state of the *Vata* and *Kaphadoshas*.
Secondly it improves blood circulation, in the area known as *Rasa RaktaSamvahana*. This helps alleviate pain by eliminating substances that contribute to discomfort through enhanced blood flow.
Lastly the heat stimulates *Dhatwagni* (tissue) ensuring metabolism of *dhatu*. It aids in digestion of *Amadosha* in the area and provides nourishment from *PurvaDhatu*. This results in stabilization of *Asthi* and *Majjadhatu*, offering relief from symptoms. Additionally the therapeutic heat may penetrate tissues, like *Kaphadosha* and *MamsaDhatu* to restore balance to *doshas* and provide further relief to patients [8].
Agnikarma may be an ideal treatment option for the following reasons. [4]

- It is a simple, risk-free, and cost-effective solution for pain in muscles, ligaments, joints, and bones.
- As a minimally invasive procedure, it can reduce the need for surgery.
- It does not interfere with the patient's daily routine.
- The treatment is drug-free, making it a natural alternative.
- When performed correctly, it carries no negative side effects.
- It is a daycare procedure, meaning no hospital stay is required.
- It can help delay or avoid the need for surgery.
- Positive results are typically seen within 2-4 weeks of treatment.

What Agnikarma Does [5]:

- Accelerates metabolism
- Enhances blood circulation
- Relieves pain
- Stimulates nerve function
- Relaxes muscles and reduces joint stiffness
- Reduces infection and inflammation

Advantages of Agnikarma:[6]
Agnikarma is superior to Bheshaja (medication), Shastra (surgery), and Ksharakarma (caustic treatment) because it effectively eliminates diseases that do not recur once treated with Agni. Unlike other treatments, Agni can address conditions that cannot be cured with medicine, Kshara, or surgery. The application of heat causes vasoconstriction, which helps prevent hemorrhaging.
Samyak Laxana
The *Samyak Laxana* of *Agnikarma* is *Rakta Srava Shanti* in *Siraveda, AtiRaktasrava* in *Twak Dagdha*, Sound of *Twak Dagdha, Lasika Yuktasrava, Tala Phala*-like colour, *Kopata Varna*, and quick healing.[14]

Suitable Season for *Agnikarma*: [9]
Agnikarma can be practiced at any time, with the exception of Sharada and *Grishma*. Even in these seasons, it can be used in emergency states that can only be cauterated after the appropriate countermeasures have been taken.

Different instruments for the *Dagdha* [14]

***Dagdha* type**	**Equipment used**
Twak Dagdha	*Suryakanta Mani, AjaSakrit, Pippali, Godanta, Kshara,* and *Shalaka*
Mamsa Dagdha	*Jambostha,* in addition to other metals like *Lauha, Swarna, Tamra, Rajata,* and *Kamshya*

Contraindications of *Agnikarma* [10]
1. Wounds from which a foreign body cannot be removed
2. Individuals with multiple wounds
3. Individuals with a perforated alimentary canal
4. Individuals who are not suitable candidates for caustic alkali therapy
5. People of *Pittaj Prakriti* (However, *Agnikarma* can be performed following cold therapies (*Sheet Chikitsa*) and the administration of slimy foods in emergencies)
6. Individuals with internal bleeding (*Antahshonita*)
7. Ruptured viscera (*Bhinnakoshtha*), or when a foreign body is present (*Nuddhritashalya*)
8. Emaciated individuals (*Durbala*)
9. Children (*Bala*)
10. Elderly individuals (*Vriddha*)
11. Cowardly individuals (*Bheeru*)

Precautions:
Agnikarma should not be performed on an empty stomach. It is recommended to consume *Pichilaanna* (sticky food) before the procedure. Careful consideration should be given to the body parts being treated, the season, and the patient's *Vyadhi* (disease) and *Dosha* state. After the procedure, the *Shalaka* (instrument) should be heated carefully and applied to the designated area.

LASER THERAPY

Laser treatments are advanced medical procedures that utilize focused light. Unlike most light sources, lasers (an acronym for Light Amplification by Stimulated Emission of Radiation) emit light at specific wavelengths. This allows them to be concentrated into powerful beams, capable of cutting steel or shaping diamonds.[7]
In the field of aesthetics, laser technology has emerged as a versatile tool with a wide range of applications for treating various skin conditions. Different types of lasers, such as pulsed Nd lasers, CO_2 lasers, Erbium lasers, and Neodymium lasers, are commonly used in these procedures.[11] These devices are employed to address issues like warts, moles, birthmarks, sunspots, and unwanted hair growth. They also help reduce the visibility of wrinkles, blemishes, scars, and even tattoos.[7]
Before undergoing any laser procedure, it is crucial to follow a defined protocol. This includes providing patients with detailed information about the treatment, obtaining informed written consent, and ensuring their physical and mental readiness. In some cases, anesthesia may be administered to enhance comfort during the procedure. Lasers have proven to be effective and versatile solutions for addressing various cosmetic and dermatological concerns.[12]
The principle behind laser treatments lies in the photothermal or photomechanical destruction of target tissues. Target structures absorb the coherent, monochromatic light of specific wavelengths. When this light energy is converted into thermal energy, the target structure is destroyed. Depending on the pulse duration and energy density, this can result in either coagulation (photothermal effect) or blasting (photomechanical effect).
For instance, warts, which are characterized by vessel dilation and proliferation, have been treated using 585-nm pulsed dye lasers. Hemoglobin in the blood exhibits strong absorption peaks at 585–595 nm and significant absorption between 800–1,100 nm. This makes it a suitable target for such lasers. The 1,064-nm Nd laser, in particular, is effective for treating conditions like telangiectasias due to reduced melanin absorption at this wavelength, which minimizes pigmentary side effects. Research has demonstrated the efficacy of long-pulsed 1,064-nm Nd lasers in treating facial and lower extremity telangiectasias, venous lakes, and warts by targeting the blood vessels within the lesions. When the long-pulsed 1,064-nm Nd laser is applied to the skin, red structures like cutaneous blood vessels absorb the laser's energy, leading to rapid heating and rupture. This process results in purpura (bruising), which typically resolves within 5–7 days. With repeated treatments, vascular lesions gradually fade.[13]

The mechanism of action for long-pulsed Nd:[13] lasers in wart treatment is thought to involve targeting the dilated blood vessels in the papillary dermis. Studies using light microscopy have shown separation of the dermoepidermal junction, epidermal necrosis, RBC extravasation, and dense inflammatory infiltrates surrounding destroyed blood vessels seven days post-treatment. This destruction may eliminate the wart's nutrient supply or rapidly dividing epidermal cells containing HPV. The precise targeting of the laser minimizes damage to surrounding tissues, enhancing treatment efficacy and safety.

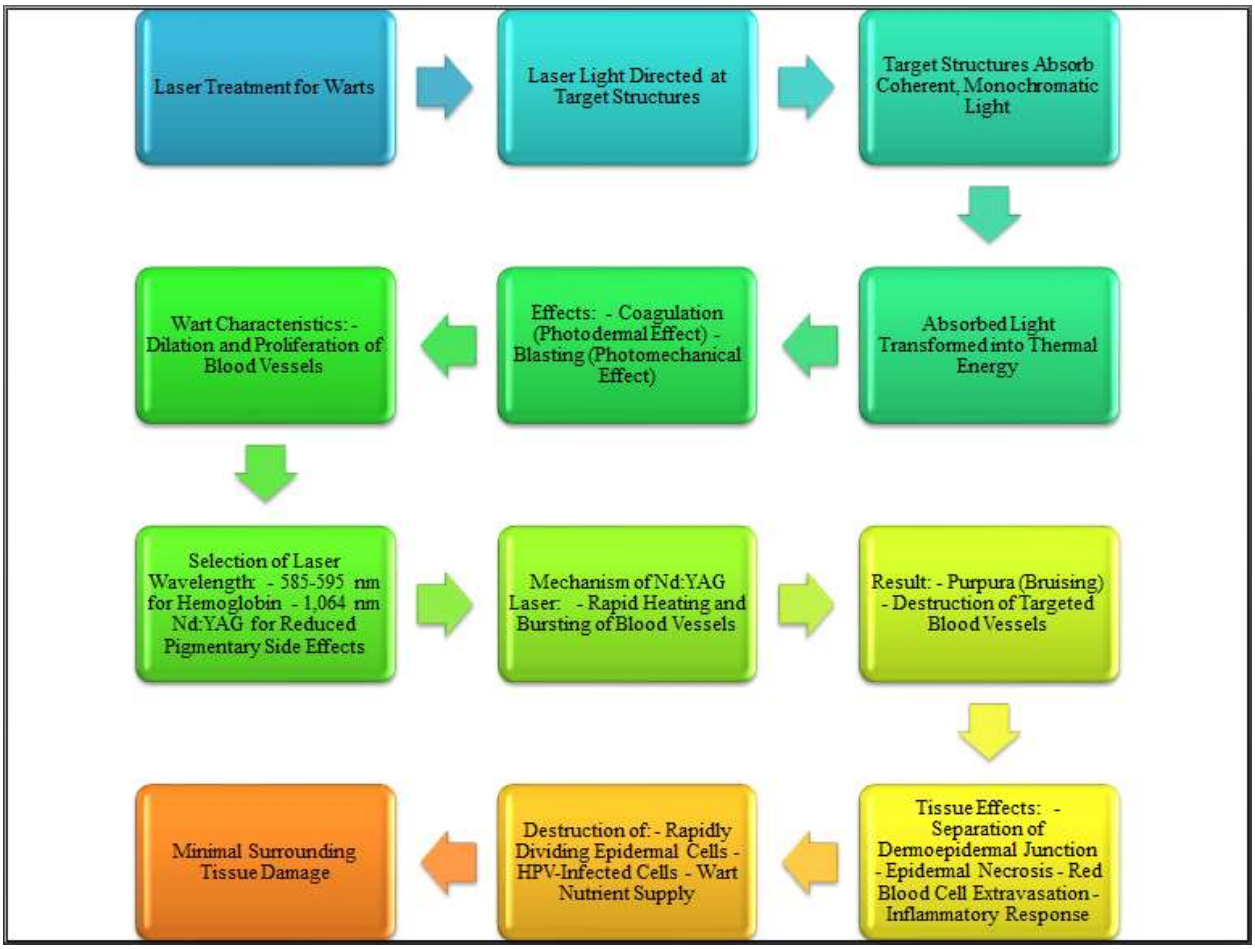

Fig:2 Mode Of Action of Laser

Risks of Laser Treatment

The risks associated with laser treatments, including wart removal, vary depending on the type of laser used. Common risks include:

- Pain: Discomfort during and after the procedure is common.
- Abrasions: The skin may develop scrapes or surface injuries.
- Pigment Changes: Changes in skin color, such as hyperpigmentation (darkening) or hypopigmentation (lightening), may occur.
- Scarring: There is a potential for scar formation, particularly in sensitive or improperly treated areas.

DISCUSSION

Warts, or papillomata, caused by the human papillomavirus (HPV), are one of the most common dermatological conditions, presenting in various clinical and morphological forms. Verruca vulgaris, or cutaneous warts, is the most prevalent type, appearing as hard, rough masses with sharply defined borders measuring 1 to 5 mm in diameter. These lesions commonly protrude from the skin's surface and are most frequently observed on the hands. Flat warts (verruca plana), which are slightly raised and smoother in appearance, are often seen on the faces, necks, and dorsum of the hands, particularly in children. Plantar warts, predominantly found on the soles of the feet, are more common in individuals who walk barefoot, whereas hand warts are frequently associated with handling raw meat. Multiple

periungual warts are commonly observed in nail-biters. Immunosuppression is a significant risk factor that predisposes individuals to the development of warts, irrespective of their type (14).

Cryotherapy remains a widely used treatment for warts, both as an over-the-counter option and in clinical practice. This method involves freezing the wart, causing cellular destruction. Pulsed dye laser therapy, which targets the dilated capillaries supplying the wart, is another treatment modality. By selectively destroying these capillaries, pulsed dye lasers effectively eradicate warts. However, this method requires expensive equipment and is typically available only in specialized dermatological clinics, making it less accessible. Despite its higher cost, pulsed dye laser therapy is generally well-tolerated (15).

Evidence from a randomized controlled trial (RCT) involving 37 participants found no significant difference in the 14-week wart removal rates when pulsed dye laser therapy was used. Additionally, a comparative study between Agnikarma, a traditional heat-based therapy, and pulsed dye laser therapy reported no statistically significant difference in cure rates between the two groups. Nevertheless, uncontrolled studies suggest that pulsed dye lasers can achieve a wart removal efficiency of 70–90%, though plantar warts appear to be the least responsive to this treatment modality (15).

In a study contrasting cryotherapy (Agnikarma) with pulsed dye laser therapy, 70% of patients treated with Agnikarma showed improvement after two sessions, while 66% of patients treated with pulsed dye laser therapy exhibited similar outcomes. This finding highlights the comparable efficacy of these two treatments in managing warts. However, due to the advanced technology and costs involved, pulsed dye laser therapy is recommended as a third-line treatment for common and flat warts and as a second-line treatment for plantar warts, where other methods may be less effective (16).

These findings underscore the importance of tailoring treatment choices to the type and location of warts, patient preferences, and resource availability. Further research, especially large-scale, controlled trials, is needed to better understand the comparative efficacy and cost-effectiveness of these treatment options.

CONCLUSION

Warts, caused by the Human Papillomavirus (HPV), are common skin conditions characterized by raised bumps. Strong evidence suggests that warts are transmitted through direct contact with infected tissue or indirectly via contaminated surfaces. The risk of transmission increases with skin exposure, particularly in activities like sports that involve bare feet. There are five distinct types of warts, each requiring tailored treatment approaches.

Agnikarma, an Ayurvedic therapy that employs heat application using specific materials and techniques, has shown promising results in wart treatment. On the other hand, laser therapy, which uses focused light tuned to specific wavelengths, offers a modern medical approach. Both treatments have their merits and limitations. However, evidence from this study suggests that *Agnikarma* provides more consistent results, including complete eradication of warts with minimal recurrence, compared to laser therapy, which has shown some instances of recurrence.

Ayurveda emphasizes holistic healing by addressing the root cause of the disease rather than providing temporary symptom relief. *Agnikarma* exemplifies this principle, demonstrating excellent efficacy when applied under suitable conditions with proper care and precautions. The growing awareness and acceptance of Ayurvedic modalities, such as *Agnikarma*, highlight their potential in managing conditions like warts effectively. With accurate patient assessment and adherence to protocol, *Agnikarma* stands out as a reliable and sustainable treatment option, reducing the likelihood of recurrence and promoting comprehensive healing.

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