

Study Letters

A retrospective analysis of the therapeutic effectiveness of 1064nm long pulsed neodymium: yttrium aluminum garnet laser in common warts: An Indian study

Sir,

Warts are commonly encountered in clinical practice. Chemical cautery, keratolytics, cryotherapy, electrocautery, immunotherapy and lasers are its popular treatment options.

Carbon dioxide laser (CO₂), pulsed dye laser (PDL) and long pulsed neodymium (Nd):yttrium aluminium garnet (YAG) laser have demonstrated varying rates of therapeutic success; their principle mode of action being photothermal or photomechanical destruction of target tissue. They provide better clearance rates and have lesser adverse effects than conventional therapies.¹ We failed to find any Indian study regarding long-pulsed Nd:YAG use in warts.

We analyzed the medical records of all patients with common warts presenting to the department of dermatology, Yenepoya Medical College Hospital, Deralakatte, Mangalore, who were treated with 1064 nm long-pulsed Nd:YAG, between May 2019 and July 2019. Demographic details, therapeutic

response and adverse effects were recorded at each visit. These patients were followed up at 1 month and 3 months posttreatment. For assessment, therapeutic response was graded as: complete resolution (complete disappearance of lesion); partial resolution (partial disappearance with few remnants) and no resolution (lesion intact); adverse effects classified as: pain/hemorrhagic bulla/ulceration/secondary infection/post-inflammatory hyperpigmentation/scarring and recurrence (present/absent). We used the USFDA approved 1064nm Hyperion long pulsed Nd: YAG laser (Laseroptek Co. Ltd.), for treating common warts, with the following settings: fluence: 150 mJ/cm², on-time: 40 msec and spot size: 5 mm. We administered 2% lignocaine (sub cutaneous) prior to procedure. Entire area of warts was covered using 2-3 passes of slightly overlapping pulses of laser, including a single course of slightly overlapping pulse for 1mm perilesional normal skin.

We included 18 patients with 60 warts (M:F 12:6). Thirteen (72.22%) patients belonged to 21-30 year age-group, majority (61.11%) being students. Sixteen (88.89%) subjects were asymptomatic. Only 2 patients (11.11%) presented within the first month of appearance of verrucae [Table 1]. In our study, lesions had a predilection for hands. Complete resolution occurred in 54 lesions (90%) at 1 month follow-up [Figures 1 and 2], while three (5%) lesions showed partial and no-resolution each [Figure 2]. Overall, 27 lesions (45%) healed with minimal scarring [Figure 2b]. Nine (15%) lesions developed hemorrhagic bulla 5-7 days

Table 1: Results of 1064 nm hyperion long pulsed neodymium:yttrium aluminium garnet laser in common warts

Response	Number (n=60), n (%)	Recurrence (n=60), n (%)
Complete resolution	54 (90)	2 (3.3)
Partial resolution	3 (5)	3 (5)
No resolution	3 (5)	NA

NA: Not assessed

Table 2: Comparison of various studies utilizing 1064 nm long pulsed neodymium:yttrium aluminium garnet laser in the treatment of warts

Authors	Equipment	Patients/lesions	Sittings	Fluence (J/cm ²)	Ontime (ms)	Spot size (mm)	Clearance rate (%)	Recurrence (%)
Present study	Hyperion (Laseroptek. Co. Ltd.)	18/60	1	150	40	5	90	8.33
Han <i>et al.</i> ³	Cutera, Inc., Brisbane, USA	348/348	4	200	20	5	96	3.3
Kimura <i>et al.</i> ⁴	Cutera, Brisbane, USA	20/34	6	150-185	15	5	56	NR
Bingol <i>et al.</i> ⁵	XP Max, Fotona, Ljubljana, Slovenia	51/146	2	180-200	23	3	100	Nil
Goldberg <i>et al.</i> ⁶	PinPointeFootLaser, NuvoLase, Inc.	25/63	3	200	1	NR	65.08	NR
Smith <i>et al.</i> ⁷	Fotona XP2 Nd:YAG, Slovenia, Fotona, Luciana	53/NR	2-9	240	25	2	60.9	NR
El-Mohamady Ael <i>et al.</i> ⁸	Cynosure Corporation-Cynergy model, USA	46/NR	6	100	20	7	78.3	8.7

Nd:YAG: Neodymium:yttrium aluminium garnet, NR: Not reported



Figure 1a: Multiple warts – pretreatment



Figure 1b: Partial resolution at 2 weeks



Figure 1c: Complete resolution at 1 month

after procedure [Figure 3], and 5 (8.3%) lesions cleared with post-inflammatory hyperpigmentation. Only 2 lesions (3.33%) developed an ulcer following procedure, which healed over several weeks. We noted recurrence of 5 lesions at 3-month follow-up. (recurrence rate: 8.33%) [Table 1 and Graph 1].

Warts are a common cause of concern due to their unsightly appearance and infective nature. Several therapeutic

modalities have been tried for this condition; however, none can be considered the gold standard. long-pulsed Nd:YAG targets haemoglobin (chromophore) within blood vessels of warts. It is easier and quicker to perform, does not produce fumes, has a lower recurrence rate, minimal adverse effects and good patient compliance while being equally effective as cryotherapy or electrocautery.² In our study, the rate of complete resolution with single sitting was around 90%. Minimal scarring, hemorrhagic bulla, post-inflammatory hyperpigmentation and ulceration were the notable adverse effects.

Table 2 summarises the studies concerning long-pulsed Nd:YAG use in warts.³⁻⁸ The largest study conducted by Han *et al* (Korea) involved four sittings to treat verruca vulgaris in 369 patients.³ They used higher laser parameters and achieved a higher clearance rate (96%) after one sitting, while post-procedure pain, transient numbness and hemorrhagic bulla were the reported adverse effects. They observed lower recurrence rate in comparison to our study, which may be attributed to more number of sittings. Kimura *et al.* noted a lower clearance rate (56%) than ours, which could be due to their exclusive inclusion of recalcitrant warts and difficult to treat locations.⁴ Our experience in treating warts with long-pulsed Nd:YAG has been encouraging because of its utility in managing multiple warts in one sitting and easy accessibility of difficult areas like fingertips. Our study was limited by the small sample size and lack of a comparator group.

Therefore, long-pulsed Nd:YAG is a safe and effective treatment modality for verruca vulgaris with minimal adverse



Figure 2a: Common warts - pretreatment

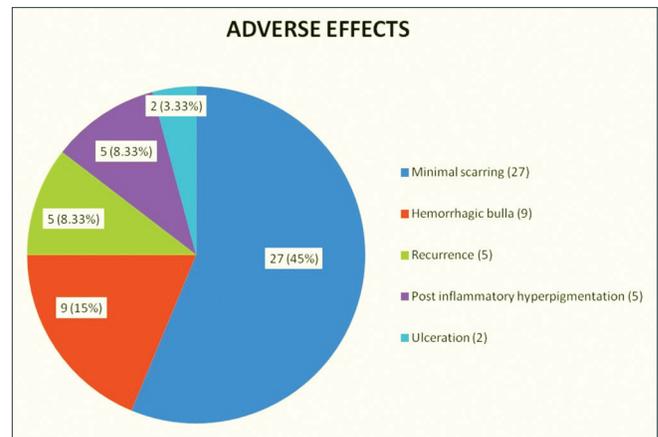


Figure 2b: Partial (left) and complete (right) resolution with scarring at 1 month



Figure 3: Hemorrhagic bulla on 7th day

effects, better patient compliance and lesser downtime. As there is lack of Indian studies evaluating its benefit in common warts, further large-scale studies with comparator group are necessary, to assess its role in the Indian set-up and optimise the laser parameters for Indian skin. We recommend inclusion of long-pulsed Nd:YAG as one of the preferred therapies for warts if facilities are available.



Graph 1: Adverse effects of 1064 nm hyperion long pulsed neodymium: yttrium aluminum garnet laser

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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