

Successful Treatment of Flat Warts by Cryotherapy and Acupuncture

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ABSTRACT

Background and Aim: Flat warts caused by human papilloma virus type 3, 10, 27 and 41 brings many cosmetic problems to children and young adults. Cryotherapy is the destruction method of tissue by the application of extreme cold and has been indicated as a treatment modality for the management of flat warts. Acupuncture is widely used in the prevention and treatment of a variety of diseases. Precisely how acupuncture destroys warts is not well understood, but theory is that acupuncture at SI6 weakens the virus function by activating the immune system. To determine the efficacy of combined cryotherapy and acupuncture of flat warts. **Methods:** 83 patients (age range; 10~40 years) with clinically diagnosed flat warts (1 month after onset) were recruited. Patients were randomized to receive combination of cryotherapy and acupuncture, cryotherapy alone and acupuncture alone. Data was analyzed to determine local response and clinical effectiveness of combination treatment. **Results:** Of 83 patients, 34 (41.0%) were treated with combination treatment, 26 (31.3%) were treated with cryotherapy alone and 23 (27.7%) were treated with acupuncture alone. 31 patients (91.2%) in the combination group vs 9 patients (34.6%) in the cryotherapy group vs 4 patients (17.4%) had complete resolution of flat warts. **Conclusion:** Combination of cryotherapy and acupuncture was significantly more effective than individual treatments.

Keywords: Acupuncture, Cryotherapy, Flat wart, Human Papilloma Virus, Immune response.

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INTRODUCTION

Flat warts are most frequently caused by Human Papilloma Virus (HPV) types 3, 10, 28 and 41. They typically present as skin-colored or light brownish, flat-topped papules on the face, beard area, dorsal hands and shins, which primarily affects children and young adults.^[1] Although there are many therapeutic modalities, including salicylic acid, imiquimod, retinoids, intralesional immunotherapy and topical 5-aminolevulinic acid photodynamic therapy, no monotherapy has been proved to achieve complete remission in every case.^[2]

Cryotherapy is the destruction method of tissue by the application of extreme cold and has been indicated as a treatment modality for the management flat warts.

Commonly used cryogens include liquid nitrogen (-196°C), liquid oxygen(-183°C), nitrous oxide (-89°C), carbon dioxide in solidified form (-78°C), propane (-42°C), chlorodifluoromethane

(-41°C) and dimethyl ether (-24°C). We use cryogen (liquid oxygen) to the tissue by cotton swab.^[3] Cryotherapy is effective for flat warts, but is often avoided because of risk for hypopigmentation and hyperpigmentation.

Acupuncture is widely used in the prevention and treatment of a variety of diseases.^[4] Precisely how acupuncture destroys flat warts is not well understood, but theory is that acupuncture at SI6 weakens the virus function by activating the immune system. Acupuncture at SI6 is effective within 1 month after warts' onset, but after 1 month it often does not work. Combination of cryotherapy and acupuncture is effective in any causes of flat warts.

MATERIALS AND METHODS

This randomized controlled trial was conducted at the outpatient dermatology clinic from January 10, 2021, to December 20, 2023. The study was approved by the Institutional Ethics Committee and written informed consent was obtained from all participants or their legal guardians.

A total of 83 patients aged 10 to 40 years with clinically diagnosed flat warts were recruited.



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Randomization and Group Allocation

Patients were randomly assigned to one of the following three treatment groups:

Combination therapy group (n=34)

Received both Cryotherapy and Acupuncture. This group received cotton swab of liquid oxygen for 2 or 3 sec once a day and acupuncture at SI6 (total 15 min including 2~3 min twirling needles) once a day.

Cryotherapy alone group (n=26)

Received cotton swab of liquid oxygen to warts for 10 sec once a week.

Acupuncture alone group (n=23)

Received acupuncture at SI6 (total 15 min including 2~3 min of twirling needles) once a day. SI6 acupuncture is to put needle into the space between articulation radioulnaris distalis about 4~5 “Phun” after taking palm towards patient’s chest. (1 “Phun”=0.25cm).

Randomization was performed using a computer-generated random number sequence and group assignments were concealed in sealed envelopes.

Follow-Up and Outcome Assessment

Patients were assessed at baseline and followed up every four weeks. Treatment efficacy was evaluated based on:

Clinical Resolution of Warts: Complete resolution was defined as the total disappearance of warts without residual pigmentation or scarring.

Local Adverse Reactions: Presence of bulla, brown crust formation, hyperpigmentation, or hypopigmentation was documented.

Time to Resolution: The mean duration required for complete wart resolution in each group was recorded.

Statistical Analysis of Data

Data analysis was performed using SPSS version. Descriptive statistics were used to summarize baseline characteristics. Group comparisons were conducted using the independent t-test for continuous variables and the chi-square test for categorical variables. A *P*-value of <0.01 was considered statistically significant.

RESULTS

Between January 10, 2021 and December 20, 2023, a total of 83 patients were enrolled and completed the study. The participants were divided into three groups: 34 patients in the combination therapy group (cryotherapy and acupuncture), 26 patients in the cryotherapy-alone group and 23 patients in the acupuncture-alone group. The demographic characteristics of the patients (Table 1), including sex and age distribution, were comparable among the three groups, with no statistically significant differences ($p > 0.05$). The mean age of the participants ranged from 26.2 ± 9.2 years to 27.4 ± 10.0 years and the proportion of female participants was similar across the groups.

Following treatment, local adverse effects were observed only in the combination therapy and cryotherapy-alone groups, while no adverse effects were reported in the acupuncture-alone group. The incidence of bulla formation was significantly lower in the combination therapy group (50.0%) compared to the cryotherapy-alone group (100.0%) ($P < 0.01$). Similarly, brown crust formation was observed in 55.9% of the combination therapy group but occurred in 100.0% of the cryotherapy-alone group ($P < 0.01$). The occurrence of hyperpigmentation was also significantly reduced in the combination therapy group (29.4%) compared to the cryotherapy-alone group (92.3%) ($P < 0.01$) (Table 2).

The mean time for complete wart resolution was significantly shorter in the combination therapy group compared to the cryotherapy-alone and acupuncture-alone groups ($P < 0.01$). Patients receiving combination therapy achieved wart resolution

Table 1: Demographic Characteristics.

Characteristic	Combined cryotherapy and acupuncture (n=34)	Cryotherapy (n=26)	Acupuncture (n=23)
Sex, No. (%) female	32 (94.1)	24 (92.3)	22 (95.7)
Age, mean \pm SD, y	27.3 \pm 8.7	27.4 \pm 10.0	26.2 \pm 9.2

Table 2: Local adverse changes after treatment in 2 groups (Combination group and Cryotherapy group).

	Combination No. (%)	Cryotherapy No. (%)	Significance
Bulla	17 (50.0)	26 (100.0)	$P < 0.01$
Brown crust	19 (55.9)	26 (100.0)	$P < 0.01$
Hyperpigmentation	10 (29.4)	24 (92.3)	$P < 0.01$

Table 3: Comparison of mean time of warts resolution.

Treatment	N	Mean time (d)
Combination	34	23.5±1.8*
Cryotherapy	26	28.6±2.5
Acupuncture	23	30.3±2.9

*represents significance level of $P<0.01$ in comparison of cryotherapy only and acupuncture only with combination.

Table 4: Resolution effect of combination therapy.

Treatment	Complete	Partial	No change
Combination	31 (91.2)*	2	1
Cryotherapy	9 (34.6)	12	5
Acupuncture	4 (17.4)	10	9

*represents significance level of $P<0.01$ in comparison of cryotherapy only and acupuncture only with combination.

in 23.5±1.8 days, while those receiving cryotherapy alone required 28.6±2.5 days and those in the acupuncture-alone group had the longest resolution time of 30.3±2.9 days (Table 3).

In terms of treatment efficacy, the combination therapy group demonstrated the highest complete resolution rate of 91.2%, which was significantly greater than that observed in the cryotherapy-alone group (34.6%) and the acupuncture-alone group (17.4%) ($P<0.01$). Partial resolution was seen in 5.9% of the combination therapy group, 46.2% of the cryotherapy-alone group and 43.5% of the acupuncture-alone group. Meanwhile, treatment failure (no change in wart size or persistence) was minimal (2.9%) in the combination therapy group, compared to 19.2% in the cryotherapy-alone group and 39.1% in the acupuncture-alone group (Table 4).

DISCUSSION

Flat wart is a chronic condition that often affects young people.^[5] Some trials have shown that the average reported Cure Rate (CR) of cutaneous warts with placebo preparations was 30.0% within 10 weeks,^[6] and while one-half of cutaneous warts resolve spontaneously within 1 year.^[7] Watchful waiting, cryotherapy and salicylic acid are recommended options for new warts.^[8] However, some patients with recurrent flat warts of longer duration (≥ 1 year) are recalcitrant to a variety of standard treatments. Some therapies can cause enormous physical and psychological harm to patients.

HPV grows in the prickle-cell and granule cell layers of the epidermis. Infected cells form independent and closed skin lesion because of physiological barrier effect, so that infected cells cannot contact with circulated immune cells. In addition, antigen presenting level of epidermal basal cells is relatively low and it presents only in nucleus. Even if there is strong antigen presentation in a differentiated cell, immune system cannot

contact with virus antigen, because of the lack of growth and quick desquamation.

We recognized that combination of cryotherapy and SI6 acupuncture is effective treatment of flat warts, because this combination makes virus antigen closer to immune system and enhances immunologic response.

CONCLUSION

Our study shows that combined cryotherapy and acupuncture is an excellent treatment option for management of flat warts. We recommend combination of cryotherapy which suddenly stimulates the surface of extruded wart using cotton swab of liquid oxygen for 2 or 3 sec once a day and acupuncture at SI6 (total 15 min including 2~3 min twirling needles) once a day. Combined cryotherapy and acupuncture have low adverse skin changes, low time of wart resolution and high complete resolution rate.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

HPV: Human Papilloma Virus; **SI6:** Small Intestine 6 (Acupuncture Point); **Phun:** Traditional Unit of Measurement in Acupuncture (1 Phun=0.25 cm).

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