Available online www.jocpr.com

Journal of Chemical and Pharmaceutical Research, 2015, 7(9):947-950

Research Article

ISSN : 0975-7384
CODEN(USA) : JCPRC5

Treatment of common warts: comparing cryotherapy (liquid nitrogen) and 15% potassium hydroxide

Mohammad Omidian, Salah Shohani and Nader Pazyar

Department of Dermatology, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

---

ABSTRACT

Warts are the most common viral infections caused by human papillomavirus. Although there is no definite treatment for them, new treatments which are safe, cost benefit, and easy to use will help to improvement of patients. To compare efficacy and safety of 15% potassium hydroxide (KOH) solution versus cryotherapy in the treatment of common warts. A total of 34 patients with common warts diagnosed by a dermatologist were enrolled in this open-label therapeutic trial. The common warts in the right-sided (hand or foot) were treated with cryotherapy while left-sided lesions treated with 15% KOH solution. The patients were evaluated at every week after the treatment to assess the cure rate and adverse events. Mean time of improvement was 34 and 29 days using cryotherapy and 15% KOH solution, respectively. This demonstrated a statistically significant difference (P =0.001). Also, adverse events including pain, erythema, ulcer, and necrosis were less in KOH group than cryotherapy one which it was statistically significant (P<0.05). Our results demonstrated that 15% KOH solution might be effective with low adverse events in the treatment of common warts. Further clinical studies with the applied concentration and larger sample size are warranted.

Key words: warts; potassium hydroxide; cryotherapy
Registration number: IRCT20140811876N1

INTRODUCTION

Warts (*verrucae*) result from a hyperkeratotic reaction to benign proliferation of epidermal skin with human papillomavirus (HPV) infection (1-6). Warts are very frequent in the general population with prevalence rate of 22-33% among primary schoolchildren (2). So far, 120 HPV types have been recognized and they are accompanied with involvement of particular anatomical locations (7).

A wide armamentarium of surgical, physical, chemical or immunological therapies has been used but none of them proved to be uniformly efficient (8-11). Cryotherapy is a recognized procedure for viral warts therapy in primary care (12). Cryotherapy is commonly used as the first line treatment of wart in the hospitals. This treatment is repeated every two weeks and its main side effect is pain and pigmentation (13). Cryotherapy with using liquid nitrogen can cause damage to edema and dermal vascular and consequently, dermal and epidermal necrosis (14).

Potassium hydroxide (KOH) is a strong alkali used to diagnosis fungal infection of skin, hair and nail. It dissolves keratin and penetrates deeply into the skin warts (15). KOH is simple to use and suited for self administration. Its side effects include erythema, swelling, burning, erosion and hypopigmentation. (KOH) as a strong alkali and keratolytic agent has been used in the treatment of skin viral infections including genital warts and *Molluscum contagiosum* (15-20). Notably, KOH can identify skin fungal infections based on digestion of proteins and lipids, and also other epithelial debris. It diffuses deeply into the skin through keratin destruction (19, 21-24).

In the previous studies 5% KOH solution have been used in the treatment of plane warts (25), but in the medical literature we did not find any studies regarding the evaluation of 15% KOH solution in the treatment of common warts. Therefore, we decided to test this solution to attain more response and compare it with cryotherpy in the common warts treatment.

MATERIALS AND METHODS

This clinical trial was conducted at Dermatology Clinic of Imam Hospital located in Ahvaz, Southwest Iran. A total of 34 patients with common warts on the hands and feet were enrolled in the study. Diagnosis was done by a dermatologist based on physical examination. Exclusion criteria were age of less than 2 years, chronic diseases, immune suppression and not using of any medication within recent 3 months, pregnancy, and lactation. Ethical Committee of Ahvaz Jundishapur University of Medical Sciences approved this trial. An informed consent form was obtained from the patients or their guardians and also, a questionnaire completed for each participant. We treated right-sided lesions of the patients with cryotherapy and the left-sided ones with 15% KOH solution. Cryotherapy using liquid nitrogen was applied every 2 weeks at the hospital. On the other hand, 15% KOH solution was given to the patients in a bottle and they were instructed how to use 2 times daily. At each visit, response to the treatments and local and systemic reactions of medications were recorded.

RESULTS

Out of 34 patients, five patients were dropped out the study because of problems in attendance to the hospital; therefore, 29 patients completed the study. A total of 12 patients (41.37%) were male and 17 (58.62%) were female. Minimum age of patients was 3 years and the maximum age was 33 years (mean age of 17.29). Considering the disease duration, 8 patients (27.5%) had common wart for 6 months, 10 (34.48%) for 6 to 12 months and 11 (37.9%) for more than 12 months. Totally, 24 patients had common wart on the hands and 5 had on the feet. Considering lesion numbers, 2 patients (6.89%) had 2 common wart, 14 (72.4%) 2-6, and 13 (44.82%) more than 6 lesions. Mean time of improvement was 34 and 29 days using cryotherapy and KOH solution, respectively. This demonstrated a statistically significant difference (P =0.001).

The mean duration of improvement in the patients younger 15 years old was 35 and 29 days with cryotherapy and KOH solution, respectively (P=0.82). In the patients older than 15 years old, mean duration of the improvement was 34.58 and 29 days with applying cryotherapy and KOH solution which demonstrated a significant difference (P=0.003).

The mean duration of treatment in men using cryotherapy and KOH solution was 31 and 26 days, respectively (P=0.07). The mean duration of treatment in women, applying cryotherapy and 15% KOH solution was 37 and 32 days, respectively which showed significant difference (P=0.008). Considering the disease duration, the common warts that had less than 6 months age, were disappeared completely in 32 and 30 days after cryotherapy and KOH solution, respectively (P=0.04). For common warts that had more than 12 months age it took 38.81 and 33.72 days to be cured by applying cryotherapy and KOH solution, respectively (P=0.02).

The common wart on the hands were cured after 34.41 and 29.16 days by applying cryotherapy and KOH solution, respectively (P=0.003). The common wart on the feet were cured after 36 and 32 days after applying cryotherapy and KOH solution (P=0.2). The improvement of the patients who had 2 common warts was done in 28 and 24.5 days by applying cryotherapy and KOH solution, respectively (P=0.5). The improvement of the patients who had 2-6 common warts was done in 34 and 30.5 days by applying cryotherapy and KOH solution, respectively (P=0.11). The improvement occurred in patients who had more than 6 lesions within 36.16 and 29.61 days by applying cryotherapy and KOH solution, respectively. This result showed significant difference (P=0.006). Also, adverse events including pain, erythema, ulcer, and necrosis were less in KOH group than cryotherapy group which showed statistically significant difference (P<0.05).

DISCUSSION

According to our study, both cryotherapy and KOH solution had equally therapeutic effects on the management of the common warts, however, in the group treated with 15% KOH solution, the common warts were disappeared in a shorter time.

Loureiro *et al. (*2007) reported the efficacy of for genital warts treatment in Brazil. They selected 35 men aged 18-49 years who had 1-15 warty lesions sized 3 mm to 2 cm. The patients were followed up for 3 months, in which the last

month was dedicated to the recurrence monitoring. In this study the cure rate of lesions with 5% KOH solution was 87.5% (5).

In 2008, Al-Hamdi and AL-Rahmani investigated 205 patients with plane wart for therapeutic effects of topical 5% or 10% KOH solutions. They used topical KOH applied once nightly in both concentrations (5% and 10%). At the end of the 4th weeks of trial 80.3% and 82% of patients showed complete response to KOH 5% and 10% solutions, respectively. This clinical trial demonstrated that KOH solution might be an effective and safe treatment for plane warts with no considerable side- effects (25).

Wickremasinghe and colleges in Colombia conducted a 4-week trial in order to investigate cryotherapy versus KOH solution (5% and 10%) in the treatment of common warts. They reported that 10% KOH was more effective than 5% KOH solution (26).

Compared with previous studies, we used higher concentration of KOH (15%) and there was no limitation time for complete disappearance of the common warts. The results of our study showed the women treated with 15% KOH solution had complete response in shorter time than the group treated with cryotherapy. Also, the lesions more than 6 months time were completely disappeared in shorter time by applying 15% KOH solution. Complete response was observed in shorter time, by applying 15% KOH solution comparing with cryotherapy in the patients older than 15 years old with more than 6 lesions and positive family history. Adverse events including pain, erythema, ulcer, and necrosis were less by applying 15% KOH solution. The improvement of common warts using 15% KOH solution was better than cryotherapy and fewer days were taken to be completely cured the common warts. This drug might have other advantages such as easy to use and self administration.

KOH's mechanism of action is supposed to be mostly related to its keratolytic properties. It leads to cells destruction and induce inflammatory response and subsequently wart improvement.

CONCLUSION

According to the results of this study, 15% KOH solution versus cryotherapy had equally therapeutic effects with low side-effects in the treatment of common warts. Further clinical investigations with the used concentration and larger sample size are warranted.

REFERENCES

[1] Yaghoobi R, Jalal Lotfi S, Pazyar N, Kazerouni A. G *Ital Dermatol Venereol*. **2014**;149:149-50.
[2] Bruggink SC, Eekhof JA, Egberts PF, van Blijswijk SC, Assendelft WJ, Gussekloo J. *Ann Fam Med.* **2013**;11:437-41.
[3] Cardone G, Moyer AL, Cheng N, Thompson CD, Dvoretzky I, Lowy DR, Schiller JT, Steven AC, Buck CB, Trus BL. *MBio*. **2014**;5(4):e01104-14.
[4] Stulberg DL1, Hutchinson AG. *Am Fam Physician*. **2003**;67:1233-40.
[5] Johannsen E, Lambert PF. *Virology*. **2013**;445:205-12.
[6] Leiding JW, Holland SM. *J Allergy Clin Immunol*. **2012**;130:1030-48.
[7] Danielewski JA, Garland SM, McCloskey J, Hillman RJ, Tabrizi SN. *PLoS One*. **2013**;8:e63892.
[8] Rübben A. *Hautarzt*. **2011**;62:6-16.
[9] Patel RV, Desai D, Cherian A, Martyn-Simmons C. *BMJ Case Rep*. **2014** Sep 8;2014. pii: bcr2013200997.
[10] Zedan H, Hofny ER, Ismail SA. *Int J Dermatol.* **2009**;48:1246-9.
[11] Lipke MM. *Clin Med Res.* **2006**;4:273-93.
[12] Sarwar U, Tickunas T. *Br J Gen Pract.* **2013**;63:239-40.
[13] Ahmed I, Agarwal S, Ilchyshyn A, Charles-Holmes S, Berth-Jones J. *Br J Dermatol.* **2001**;144:1006-9.
[14] Sterling jc .Virus infection Roolcs Text book of Dermatology ,edited by Burnst , Brrathnaed s,Cox N.7th ed:Blackwell;**2004**;2537-2553.
[15] Loureiro WR, Cação FM, Belda W Jr, Fagundes LJ, Romiti R. *Br J Dermatol.* **2008** ;158:180-1.
[16] Romiti R, Ribeiro AP, Grinblat BM, Rivitti EA, Romiti N. *Pediatr Dermatol.* **1999**;16:228-31.
[17] Uçmak D, Akkurt MZ, Kacar SD, Sula B, Arica M. *Cutan Ocul Toxicol.* **2014**;33:54-9.
[18] Handjani F, Behazin E, Sadati MS. *J Dermatolog Treat.* **2014**;25:249-50.
[19] Marsal JR, Cruz I, Teixido C, Diez O, Martinez M, Galindo G, Real J, Schoenenberger JA, Pera H. *BMC Infect Dis.* **2011**;11:278.
[20] Can B, Topaloğlu F, Kavala M, Turkoglu Z, Zindancı I, Sudogan S. *J Dermatolog Treat.* **2014**;25:246-8.
[21] Romiti R, Ribeiro AP, Grinblat BM, Rivitti EA, Romiti N. *Pediatr Dermatol*. **1999**;16:228-31.
[22] DAS S, Goyal R, Bhattacharya SN. *J Dermatol.* **2007**;34:248-53.

[23] Fulgence KK, Abibatou K, Vincent D, Henriette V, Etienne AK, Kiki-Barro PC, Yavo W, Koné M, Hervé Menan EI. *Int J Dermatol.* **2013**;52:456-60.
[24] Hainer BL. *Am Fam Physician.* **2003**;67:101-8.
[25] Al-Hamdi KI, Al-Rahmani MA. *Indian J Dermatol.* **2012**;57:38-41.
[26] Wickremasinghe NNTM, Karunasekara GP. *Sri Lanka Journal of Dermatology*. **2006**;19:58-66.