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Original Article

Efficacy and safety of trichloroacetic acid 35% versus adapalene 0.1% in treatment of molluscum contagiosum in children

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Abstract

Objective To compare the efficacy and safety of topical trichloroacetic acid (TCA) 35% versus topical adapalene 0.1% in molluscum contagiosum (MC) in children.

Methods Sixty children with MCs were divided in two equal groups. Thirty patients in group A received treatment with topical 35% TCA weekly and 30 patients in group B received treatment with topical 0.1% adapalene once daily. The patients were followed till 6 weeks for efficacy and safety.

Results The efficacy of TCA and adapalene was observed in 25 (83.3%) and 20 (66.7%) patients, respectively ($p > 0.136$). The safety of TCA and adapalene was seen among 21 (70%) and 29 (96.7%) patients, respectively ($p < 0.05$).

Conclusion The efficacy of TCA was not significantly higher than adapalene. However, adapalene is more safe than TCA.

Key words
Molluscum contagiosum, adapalene, trichloroacetic acid.

Introduction

Molluscum contagiosum (MC) was first described by Bateman in the year 1814.[1] Its viral etiology was established only in the year 1905 by Julisberg.[2]

It is caused by a DNA poxvirus called the molluscum contagiosum virus (MCV). MCV has no other reservoir than humans (infecting only humans). MCV is transmitted directly by skin-to-skin contact or indirectly through fomites.[2] This common viral disease has a higher incidence in children, most commonly affecting school aged group (2-8%), sexually active adults, and those who are immunodeficient.[3,4]

A variety of therapies exist for treatment of MC. Destructive therapies include curettage, cryotherapy, pricking with a sterile needle, electrodesiccation, photodynamic therapy and lasers; nonetheless, these are poorly tolerated in children.[5] Other topical medications include salicylic acid, tretinoin, potassium hydroxide, adapalene, trichloroacetic acid and imiquimod[6]; nevertheless, no therapy is universally effective.

Rationale of this study was to find the more effective and less irritant topical treatment of MC, which can be conveniently applied, well

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tolerated and easily available, so that the same could be used in future in children.

Methods

This study was carried out in Department of Dermatology, Sheikh Zayed Hospital, Rahim Yar Khan for a period of six months. It was a randomized control trial approved by Institutional Ethical Committee. Systematic randomized sampling was done. 60 patients aged 2-14 years having at least three MCs of less than one month duration were included in the study. The willingness of parents and children was taken to visit OPD for follow-up at weekly intervals for six weeks. Exclusion criteria were more than 100 lesions, lesions on genitalia, eyelid involvement, secondary infection or history of hypersensitivity to any of the drug used.

Diagnosis was made on clinical findings (typical dome-shaped pearly white lesions, 1-5 mm in diameter with an umbilicated center). Relevant questions were asked and examination was carried out. Data were collected on a predesigned proforma. Selected patients were divided into two groups A and B each having thirty patients. In group A, 30 patients were treated with TCA 35% solution. TCA solution was applied weekly with the help of pointed end of a wooden applicator to the center of all the lesions until a white frost appeared; immediate side effects (erythema, headache, fever) were noted within 1 hour after drug application. Patients were called back for follow-up weekly and late side effects (crusting, hyperpigmentation or hypopigmentation, scarring) were noted. In group B, 30 patients were subjected to topical adapalene. They were advised to apply 0.1% adapalene cream at night daily for three weeks. Patients were called back weekly for three weeks. At each follow-up visit, patients were examined for side effects (erythema, crusting, scarring, hypopigmentation or hyperpigmentation) and disappearance of old lesions. The final follow-up was carried out at week 6, three weeks after discontinuation of either treatment to observe recurrence. To overcome bias effects, examination and data collection were done by a single researcher.

Statistical Package for Social Sciences Version-14 was used for data entry and analysis. The quantitative variables of the study i.e. age, no of lesions were presented as mean ± SD. The qualitative variables i.e. local side effects (erythema, crusting, scarring, hyperpigmentation or hypopigmentation) and systemic side effects (fever, headache) recurrence and disappearance of lesions were presented as percentage. Chi-square test was applied to compare the efficacy in both groups. A *p* value of less than 0.05 was taken as statistically significant.

Results

The mean age of the patients in group A was 5.30 ± 3.66 years (range 2-12year) and in group B was 4.37 ± 2.76 years (range 2-14 years). More than 90% patients in both groups were aged ≤ 10 year **(Table 1)**.

In both groups males were predominantly affected i.e. 20 (66.7%) in group A and 19 (63.3%) in group B. The female to male ratio was 1:2 in group A and 1:1.72 in group B.

Lesions were distributed on different parts of body but face was predominantly affected site in both groups, in 11 (36.7%) and 13 (43.3%) patients in group A and B, respectively **(Table 1)**.

At 6 weeks follow-up, in group A, the lesions disappeared in 25 (83.3%) patients and in 20 (66.7%) patients in group B (**Table 2**). Recurrence of lesions was observed in 5 (16.7%)

Table 1 Demographic and clinical characteristics of trichloroacetic acid (group A) and adapalene (group B).

	Group A (n = 30)	*Group B (n =30)*
Age (years)		
2-4	15 (50%)	17 (56.7%)
5-7	7 (23.3%)	8 (26.7%)
8-10	5 (16.7%)	4 (13.3%)
11-14	3 (10%)	1 (3.3%)
Mean age (years)	5.30 + 3.66	4.37 + 2.76
Age range (years)	2-12	2-14
Distribution of lesions		
Face	11 (36.7%)	13 (43.3%)
Trunk (front)	6 (20%)	5 (16.7%)
Trunk (back)	5 (16.7%)	4 (13.3%)
Upper arm	3 (10%)	2 (6.7%)
Lower arm	1 (3.3%)	2 (6.7%)
Scalp	3 (10%)	2 (6.7%)
Palm and sole	1 (3.3%)	1 (3.3%)
Generalized	-	1 (3.3%)

Table 2 Efficacy of both treatments trichloroacetic acid (group A) and adapalene (group B) at final follow-up (6 week).

	Group A (n = 30)	*Group B (n =30)*
Disappearance of lesions	25 (83.3%)	20 (66.7%)
Recurrence	5 (16.7%)	10 (33.3%)

p value = 0.136 (insignificant)

Table 3 Safety of two groups trichloroacetic acid (group A) and adapalene (group B).

	Group A (n = 30)	*Group B (n =30)*
Local		
Erythema	3 (10%)	1 (3.3%)
Crusting	1 (3.3%)	-
Hypopigmentation	3 (10%)	-
Scarring	1 (3.3%)	-
Hyperpigmentation	1 (3.3%)	-
Systemic		
Fever	-	-
Headache	-	-

p value = 0.006 (significant)

patients of group A and in 10 (33.3%) patients of group B **(Table 2)**. Overall efficacy of trichloroacetic acid was 83.3% and that of adapalene was 66.7% (P = 0.136).

Table 3 compares the frequency of side effects seen in both groups. Side effects were local mainly. Erythema and hypopigmentation were noticed in 3 (10%) patients each in TCA group. Other side effects were less frequent. With adapalene, 1 (3.3%) patient developed erythema. No other local side effects were observed in this group. Safety of the drug was observed in 21 (70%) patients in trichloroacetic acid group, while adapalene group drug was safe in 29 (96.7%) patients (p = 0.006).

Discussion

The results of this study showed that trichloroacetic acid was apparently more effective as compared to adapalene (83.3% versus 66.7%) but this was not statistically significant (p =0.136). However, adapalene was safer as compared to TCA (96.7% versus 70%) and this difference was statistically significant (p=0.006).

The mean age of the children was 5.30 ± 3.66 years and 4.37 ± 2.76 years in TCA and adapalene group, respectively. In a study by Rajouria *et al.*[7] a similar mean age of the patients was observed i.e. 4.3 ± 2.9 years. In another study by Mahajan *et al*.[8] the mean age of children was 5.8 years. Majority of the children in our study were of age 2-4 years, i.e. 50% in one group and 56.7% in other group. Similarly Rajouria *et al.*[7] and Mahajan *et al*.[8] also observed that the majority of the children in their study population were of age < 5 years.

In our study, the majority of patients were male 66.7% in group A and 63.3% in group B. Mahajan *et al.*[8] in a study on Indian population, also documented a male predominance. In their study, 55.6% patients were males and 44.4% were females. However, Rajouria *et al.*[7] documented a higher proportion of females as compared to males. In their study, 54.3% were

males and 45.7% were females. This study was conducted in Nepal. This highlights that geographical distribution of the disease may also affect the prevalence of disease in different sex group.

In our study, face was affected the most i.e. in 36.7% in one group and 43.3% patients in other group. This was followed by trunk 36.7% in one group and 30% in other group and extremities i.e. 13.3% in one group and 13.4% in other group. This distribution was almost similar to that described by Rajouria *et al*.[7] who described that in 41.3% patients, lesions were present on face followed by trunk (34.8%) and in 23.9% patients lesions were present on extremities.

In our study, the most common side effects associated with 35% TCA were erythema (10%) and hypopigmentation (10%) which may be a reason for discontinuation or restriction for its use on face. However, in a study by Garrett *et al*.[9] no side effects were observed with TCA among 15 patients. They used an average peel of 35% over a period of two months and found it safe and effective. Although the results of Garrett *et al*.[9] are different from our results, this should preferably be used with caution over face.

In our study, adapalene caused erythema in 3.3% patients only. No other complication was observed. Results of study done by Gupta *et al.*[10] endorses our observation. They noticed no complication with topical use of adapalene 0.1% for treatment of plantar warts. However, Inayat *et al*.[11] reported a high rate of side effects i.e. erythema in 13.7% patients, scaling in 3.2% and itching in 10.5% patients. This difference is because of site of treatment, sole versus face.

In our study, the efficacy of trichloroacetic acid was 83.3%. There are other studies which have documented the efficacy of TCA. In a study by Sadick *et al*.[12] the efficacy of TCA was 90% in patients with molluscum contagiosum in HIV patients. Although the study population was different in both studies, this reflects a higher efficacy of the drug.

Previously, no work has been done specifically for efficacy of adapalene for treatment of molluscum contagiosum. The results of this study support the use of adapalene for molluscum contagiosum although not as effective as TCA.

This study has certain limitations. This was a single centered trial conducted in a limited population size. Topical applications of both the drugs were not carried out under strict observation as the patients were sent home and parents were responsible for treatment. So, the compliance of the treatment may be an issue. Furthermore, this was not a double-blind study.

Conclusion

Although the efficacy of TCA is high as compared to adapalene for treatment of molluscum contagiosum, there exists no statistically significant difference between the two. However, adapalene is safer than TCA. So, its use may be recommended as first-line for treatment of molluscum contagiosum. In case of lesions not responding to adapalene, TCA can be used. Moreover, looking at a lower rate of complications, adapalene can be used over lesions of face.

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Article Retracted

The article titled "Frequency of xerosis leading to asteatotic eczema in geriatrics presenting to Abbasi Shaheed Hospital, Karachi" authored by Drs. Tayyaba Iqbal, Naseema Kapadia, Saher Athar, Sadia Iqbal, Syeda Shahmoona and Maria Mansoor published in the journal of Pakistan Association of Dermatologists 2016, volume number 26, page 235-239 has been retracted as authors wanted to get it published in some other journal.