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Original Article

Comparative study of 10% potassium hydroxide and 0.05% tretinoin in treatment of molluscum contagiosum in children

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Abstract

Objective To evaluate the benefits of 10% potassium hydroxide (KOH) and 0.05% tretinoin in the management of molluscum contagiosum (MC) in children.

Methods In the present study, thirty patients presenting with MC in the paediatric age group were sorted into two groups of 15 each randomly; Group A and Group B. Group A patients were advised to apply 10% KOH and those in group B 0.05% tretinoin cream daily on the lesions and were followed up every 2 weeks till 8 weeks.

Results At the end of 8th weeks, 14 (93.3%) patients showed complete response in Group A (KOH group). In Group B (tretinoin group), 7 (46.7%) patients showed good response while 7 (46.7%) patients showed complete response. At all stages of assessment (2, 4, 6, 8 weeks), results in group A were better when compared to group B with P-value <0.01 which is statistically significant. Burning and pigmentary changes were side effects associated with KOH solution whereas erythema and scaling were seen with tretinoin.

Conclusion 10% KOH has faster onset of action and is more efficacious when compared to 0.05% tretinoin in the childhood MC management. However one must be watchful for side effects.

Key words
Molluscum contagiosum; 10% KOH; 0.05% tretinoin.

Introduction

Molluscum contagiosum virus (MCV) is a ds DNA virus belonging to Poxviridae family. MC infection is observed in three different patient populations which include, school going kids, sexually active young adults, and immunocompromised people.[1] MCV is transmitted by direct skin contact by sexual or non-sexual route or autoinoculation or via fomites like bath sponges or towels.[2] MC is diagnosed by peculiar umbilicated papules. Meta-analysis indicates point prevalence in 0-16 year children between 5.1% and 11.5%.[3] Atopic dermatitis is found to be associated with MC.[4]

Although spontaneous resolution occurs, patients need to be treated due to aesthetic reasons, limit spread and relieve anxiety. Some of the common treatment modalities include curettage, needle extirpation, cryotherapy, trichloroacetic acid application etc. Topical home based therapeutic modalities that are safe and effective are favoured over these procedures in children.

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Topical application of 10% KOH and 0.05% tretinoin cream is easy and causes negligible discomfort which has been reported to be effective in curing MC.[5] Hence, this study has been undertaken to evaluate and compare the efficacies of 10% KOH solution and 0.05% tretinoin cream in the management of MC in paediatric age group.

Methods

This study was done at Department of Dermatology, Dr. Pinnamaneni Siddhartha Institute of Medical Sciences and Research Foundationin Vijayawada, India, over a period of 18 months after approval from institutional ethics committee (Reg. No. ECR/804 dated December 09, 2019). It is a prospective interventional study with a sample size of 30. Inclusion criteria were cases of MC with age less than twelve years and those who are not willing to undergo mechanical removal. Exclusion criteria were giant lesion (>3cm) and those with known hypersensitivity to 10% KOH or 0.05% tretinoin.

After taking informed consent from the parent or guardian, patients who satisfy the above criteria were included in the study. A thorough history and clinical examination regarding the duration, atopy history, number, size and site of lesions were noted. Patients were sorted into 2 groups of 15 each. 10% KOH was applied in group A and in group B 0.05% tretinoin.

Parents were counseled to apply petroleum jelly around the lesion followed by application of agents over the lesion with the help of a cotton swab according to assigned groups at bedtime only. Parents were advised regarding the precaution to be taken with the chemicals.

Patients were followed up once in 2 weeks till 8weeks and the response to therapy and side effects were recorded during each visit. The response was graded based on the size and number of lesions **(Table1).** SPSS 21 version was performed for data analysis. Chi- Square test used in the comparison of qualitative data. P value <0.01 was taken as statistically significant.

Table 1 Grading of improvement based on size and number of lesions.

Healing lesions	*Grade/ response*
< 25% decrease in size or number of lesions.	Minimal
25- 49% decrease in size or number of lesions.	Partial
50 -75 % decrease in size or number of lesions.	Good
>75% decrease or complete disappearance of lesions.	Complete

Results

A total of 30 patients participated in the study. Mean age was 8.53±2.46years. 20 (66.7%) were female and 10 (33.3%) were male. Majority (66.7%) of the patients had lesions for less than 5 weeks and the mean duration was 3.75 weeks. Only 5 (16.7%) patients had history of atopy. Face (46.7%) was the most common site involved in our study group followed by trunk (13.3%) and more than one site was involved in 7 patients. The lesion count in majority cases was less than 5 [n=16 (53%)] and was 6-10 in 10 cases (33.3%). At the end of 8 weeks, 93.3% showed complete response in Group A and in Group B, 46.7% showed complete response and 46.7% showed good response **(Table 2, Figure 1-3)**. Side effects predominantly seen were burning and pigmentary changes with 10% KOH whereas erythema and scaling seen with 0.05% tretinoin **(Table 3)**.

Discussion

Molluscum contagiosum (MC) was first described clinically by Bateman in 1817.[6] Prompt treatment is essential for cosmetic concerns and to alleviate spread. Various treatment options include curettage, cryotherapy, CO_2 laser, pulsed dye laser and

Table 2 Response to treatment.

Response to treatment	*2 Weeks* Mode of Treatment		*4 Weeks* Mode of Treatment		*6 Weeks* Mode of Treatment		*8 Weeks* Mode of Treatment	
	KOH	*Tretinoin*	*KOH*	*Tretinoin*	*KOH*	*Tretinoin*	*KOH*	*Tretinoin*
Minimal	5 (33.3%)	14 (93.3%)	0(0%)	2(13.3%)	0(0%)	0 (0%)	0 (0%)	0 (0%)
Partial	10 (66.7%)	1 (6.7%)	5(33.3%)	12(80.0%)	0(0%)	7 (46.7%)	0 (0%)	1 (6.7%)
Good	0 (0%)	0 (0%)	10(66.7%)	1 (6.7%)	10 (66.7%)	6 (40.0%)	1(6.7%)	7 (46.7%)
Complete	0 (0%)	0 (0%)	0 (0%)	0 (0%)	5 (33.3%)	2 (13.3%)	14 (93.3%)	7 (46.7%)
*P Value	0.0007		0.0022		0.0096		0.0199	
	Significant		*Significant*		*Significant*		*Significant*	

** Chi-square test is used.

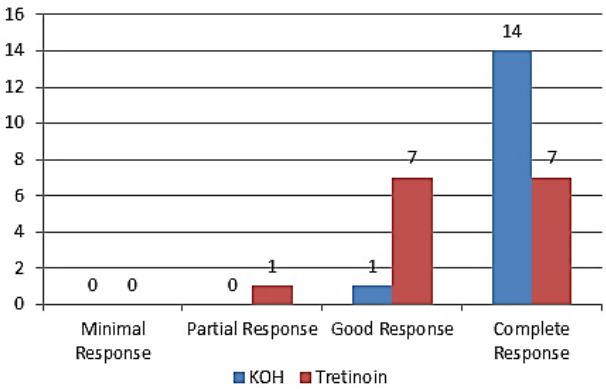

Figure 1 Response to treatment at 8th week distribution.

electrodessication, chemical destruction using KOH, TCA or cantharidin and immunomodulators like topical imiquimod, tretinoin and oral cimetidine and antivirals like cidofovir.[7-10]

The KOH solution is a strong base with a keratolytic effect and it lyses proteins and lipids.[11] It is used in 5 to 20% concentrations in MC management.[12] Use of 10% KOH would be a better option when compared to 5% and 20% KOH in terms of decreased treatment time required with the former and severity of side-effects being less when compared with the latter.

Tretinoin (0.05%) also known as all-trans retinoic acid (ATRA) is a derivative of vitamin A. Tretinoin is thought to induce local irritation damaging the viral protein-lipid membrane.[13] Its immunomodulatory property, anti-keratinization and antiproliferative action on epidermis help to inhibit the proliferation of virus.[14-16]

Children usually do not cooperate for mechanical modality of treatment for fear and anxiety. We evaluated 10% KOH solution and 0.05% tretinoin cream for the treatment of MC in children as they are convenient to apply. At all stages of assessment (2, 4, 6, 8 weeks), results in KOH group were better when compared to tretinoin group with P-value <0.01

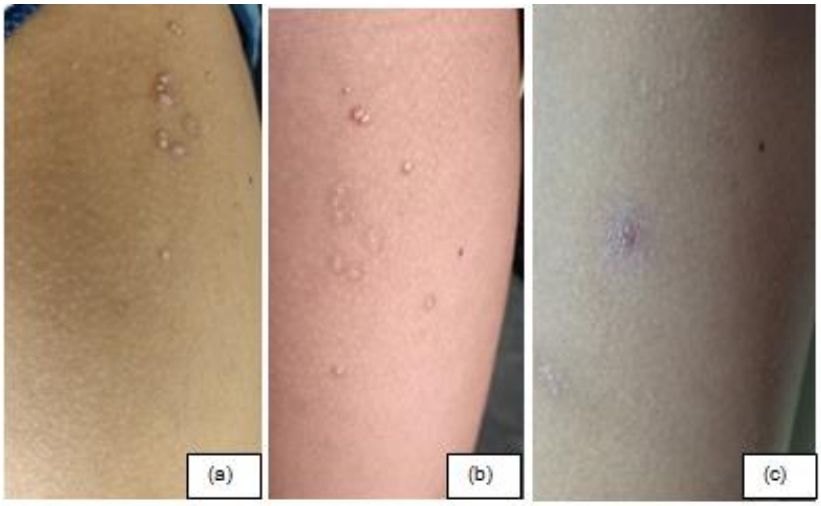

Figure 2 Photographs of the patient treated with KOH at baseline (a), 4 weeks (b), 8 weeks (c).

Figure 3 Photographs of the patient treated with tretinoin at baseline (a), 4 weeks (b), 8 weeks (c).

which is statistically significant. This shows that KOH appears to be more efficacious when compared to 0.05% tretinoin.

In a study by Mahajan *et al.* 27 patients were given 20% KOH solution to be applied at sleep time daily. There was complete clearance after a mean period of 17 days in all children.[17]

In a study by Vippan goyal *et al.* there was complete disappearance of lesions in 11 (50%) patients with 10% KOH and in 8 (44.44%) patients with tretinoin, at the end of 4weeks.[18]

With regard to the above two studies, daily KOH application gives better efficiency and a faster onset of action.

In patients who received 10% KOH, 14 (93.3%) out of 15 patients had minor side effects. 4 (26.7%) patients had burning, 5 patients had pigmentary changes and 5 patients had both. These findings were in conformity with the other studies where stinging/ burning was found to be the most common side-effect encountered with KOH solution.[17-20]

In the 0.05% tretinoin group, 10 (66.7%) patients had mild adverse effects, 5 (33.3%) patients showed scaling, 4 (26.7%) had erythema while one showed pigmentary changes. In a similar comparative study by Rajouria *et al.* in the KOH group crusting, edema, burning were the predominant complaints whereas dryness, crusting, scaling and erythema were seen in tretinoin group.[21] Counseling about correct method of application and being vigilant for early signs of irritation can minimize the side effects.

Table 3 Side effects of the treatments.

Side Effects	*KOH*	*Tretinoin*
Burning	4(26.7%)	0(0%)
Erythema	0(0%)	4(26.7%)
Pigmentary changes	5(33.3%)	1(6.7%)
Scaling	0(0%)	5(33.3%)
Burning + pigmentary changes	5(33.3%)	0(0%)
P-value	0.0004; Significant	

Both the agents are locally applicable, less traumatic and not painful. Though KOH is cheaper and leads to faster clearance of MC, it is not readily available and needs to be freshly prepared from crystals. Tretinoin has the advantage of easy availability and easy mode of application. However it takes longer duration for clearance

Conclusion

10% KOH has faster onset of action and is more efficacious when compared to 0.05% tretinoin in the treatment of MC in children. Side effects with both the agents are minimal. Burning and pigmentary changes are seen with 10% KOH whereas erythema and scaling is seen with tretinoin. Picking out early signs of irritation and educating about proper application method can minimize the adverse events.

Declaration of patient consent The authors certify that they have obtained all appropriate patient consent.

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Conflict of interest Authors declared no conflict of interest.

Author's contribution

SR: Substantial contribution to study design, acquisition of data and analysis, manuscript writing, final approval of the version to be published.

SH: Concept of the work and design, acquisition, critical review, final approval of the version to be published.

ASC: Analysis, interpretation of data, critically reviewed, final approval of the version to be published.

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