

Comparison of cryotherapy with liquid nitrogen and 10% KOH in the management of molluscum contagiosum in pediatric patients

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Abstract

Introduction: Molluscum contagiosum (MC) is a viral infection caused by a pox virus commonly affects the children. The lesions of MC are firm, small, papules <1mm size, often with an umbilicated center. MC in children mostly resolves spontaneously and the treatment does help to minimize autoinoculation and transmission to others. **Objectives:** To study demographic profile and clinical presentation of MC in pediatric patients and to study the therapeutic efficacy and side effects of liquid nitrogen cryotherapy and 10% KOH in treatment of MC in pediatric patients. **Methods:** A prospective observational study done at tertiary care hospital. Demographic details, detailed history of present and past similar illness, family history related to MC and its treatment was noted. Each patient was examined thoroughly and number, size, location of lesions were noted. All patients were divided in two groups group A (liquid nitrogen treated) & B (10% KOH treated). Results of the trial were entered in a Performa designed to facilitate the study of fate of all patients. **Results:** School going and preschool children were the commonest age group involved with 34% in each group. M:F ratio was 1.6:1. Group A showed 70% cured rate in 8 weeks of therapy while Group B 70% got cured in 4 weeks and 90% cured in 6 week of therapy. Commonest side effect was burning pain seen in 65% of patients in group A, followed by hyperpigmentation (55%), erythema (15%), hypopigmentation (10%) and infection (5%). And in Group B common side effects were hypopigmentation (56.6%), followed by burning or stinging (20%), infection (16.7%), erythema (6.7%) and infection (3.3%). **Conclusion:** 10% KOH gives faster results in 2-4 weeks of duration, while liquid nitrogen requires longer duration of treatment of 8 – 12 weeks. Also liquid nitrogen is more painful procedure, perhaps it is difficult to apply in crying children. On contrary 10% KOH is painless, with only mild stinging sensation in few patients. So, it is more feasible and has higher compliance among parents, whereas liquid nitrogen needs regular weekly visits.

Keywords: Molluscum Contagiosum, 10% KOH, Liquid Nitrogen cryotherapy, pediatrics

Introduction

Molluscum contagiosum (MC) is a viral infection limited to human and caused by poxvirus [(Molluscum contagiosum virus (MCV)], a DNA virus. MCV commonly affect the children but in adult transmitted sexually. The common mode of transmission is direct contact, also through fomites such as bath sponges and towels, and autoinoculation. Swimming pool outbreaks have been reported [1].

Molluscum contagiosum lesions primarily found in children on the face and trunk, but now they are also seen commonly in the pubic area and genitalia of

sexually active young adults. The lesions of MC are firm, small, papules <1mm size, often with an umbilicated center. The clinical appearance of MC in most cases is diagnostic and, histopathological examination can be used as an aid in the diagnosis only in cases that are not clinically obvious [2].

MC in children mostly resolves spontaneously and aggressive painful therapies are to be avoided. However, the treatment does help to minimize autoinoculation and transmission to others [3]. Cryotherapy is rapid and inexpensive method for destroying molluscum over the years. There has been steady evolution in the use of cryotherapy as a standard regime. Potassium hydroxide (KOH) is strong alkali

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that dissolves proteins and epidermal debris, clearing lesion. The aim of the research was to study the demographic profile and clinical presentation of molluscum contagiosum in pediatric patients. Also, to study the therapeutic efficacy and side effects of liquid nitrogen cryotherapy and 10% KOH in treatment of molluscum contagiosum in pediatric patients.

Methodology

Type of study: It was a prospective observational study carried out from January 2012 to April 2014

Setting: carried out at Skin Department, Shri Vinoba Bhave Civil Hospital Silvassain collaboration with Pediatric Department.

Ethical Consideration: Human Research Ethics Committee permission was taken before starting the study. Written informed consent was taken from the legal guardian of all participants before inclusion in the study.

Inclusion and Exclusion criteria: all patients with MC diagnosed were included in the study after proper informed written consent of legal guardian.

Methods: Total 50 patients were included in the study over two and half years of study. Demographic details of all participants like name, age, sex and address were noted. Detailed history of present disease was taken so as to know onset and duration of the lesion and associated complaints.

Past history of similar complaint and past treatment for molluscum was asked. Family history of similar complaint was inquired. Each patient was examined thoroughly and number, size, location of lesions were noted. Presence of pseudokoebner phenomenon and secondary infection were noted. Diagnosis was made mostly clinically. 14 patients required to do smear examination for confirmation of diagnosis.

All patients were divided in two groups group A & B. Group A patients treated with liquid nitrogen cryotherapy and Group B patients treated with 10% potassium hydroxide topical application.

Results

The most common age group of participants presenting with molluscum contagiosum were preschool (3-6 years) and school going (6-12 years) children i.e. 34% in each group. The youngest participant was of 3 month. 8% patients were infants. Gender wise distribution shows out of 50 patients, male comprise of 62% and female comprised of 38%.

Thus study shows male preponderance with M:F ratio of 1.6:1 [Table 1].

Group A – 1 liter of liquid nitrogen was transported weekly from source to outdoor and stored in 1 liter flask. Wooden stick with a cotton tip was used as an applicator.

Care was taken to see that size of cotton wool tip was slightly smaller than the molluscum, to avoid damage to the surrounding normal skin. Applicator dipped in flask was applied to the molluscum until a frozen halo appeared around its base.

A firm pressure was maintained for about 5 – 30 seconds. All mollusci presented were treated simultaneously and the patient was asked to return after a week.

It was explained to the patient that some amount of redness and blood filled blisters might occur, which should not cause and anxiety.

Group B – 10% potassium hydroxide (KOH) solution was provided to the patient in glass bottle. Parents of patients were advised to apply the solution with the help of match stick.

Care should be taken to avoid contact with normal skin. For that parent were advised to apply Vaseline on normal skin around the molluscum and then apply 10% KOH solution.

Advice was given to avoid contact of solution with the eyes and to keep it from out of reach of children. Parents were explained of twice a day application and about the possibility of some stinging sensation at site of application. They were provided with topical sodium fusidate 2%, to be applied one hour after KOH application.

The patients attended at set intervals of one week for the treatment and review. The duration of the treatment of each patient was six weeks. Results of the trial were entered in a Performa designed to facilitate the study of fate of all patients.

Statistical Analysis: it was done using descriptive statistics by Microsoft Excel.

Table-1: Age and Gender wise Distribution of all patients.

Parameters	No of patients	Percentages
Age		
Infants (<1yr)	4	8 %
Toddler (1 -3 yr)	12	24 %
Preschool (3 – 6 yr)	17	34 %
School going (6 – 12 yr)	17	34 %
Total	50	100 %
Gender		
Male	31	62 %
Female	19	38 %

Table 2 shows common presenting findings of patients. 66% of patients were presented within 8 weeks of onset of the symptoms. Positive family history was seen in 16% of the cases. Among them 14% were first degree relatives and 2%

Table-2: Presentation of all Patients

Parameters	No of patients	Percentages
Duration (weeks)		
< 2	11	22 %
2 – 4	12	24 %
4 – 8	10	20 %
>8	17	34 %
Total	50	100 %
Positive family history		
Mother	2	4 %
Sister	4	8 %
Brother	1	2 %
Cousin	1	2 %
Total	8	16 %
Precipitating factors		
Pruritus	7	14 %
Infection	6	12 %
Trauma	6	12 %
Numbers of lesions		
≤ 5	12	24 %
6 – 10	12	24 %
11 – 15	12	24 %
16 – 20	7	14 %
>20	7	14 %
Site of lesions		
Face	41	82 %
Extremities	14	28 %
Trunk	15	30 %
Size of lesions (mm)		
1 -3	39	78 %
4 -10	11	22 %
>10	-	
Pseudo-koebner phenomenon		
Present	23	46 %
Absent	27	54 %

were second degree relatives. Pruritus (24%) was the most common precipitating factor. Other precipitating factors were infections (12%) and trauma (12%). Most of the patients (72%) had lesion less than fifteen, while 14% had more than 20 lesions. And one patient had more than 50 lesions. Face (82%) was the most common site of lesion at the time of presentation. Trunk (30%) and extremities (28%) were less commonly affected sites. The size of lesions shows that 78% of patients had < 3mm size and only 22% of patients had 4 – 10 mm of size. Associated findings like tinea corporis, phrynoderma and lichen urticatus were also found, all in one patient each.

In Group A (Liquid Nitrogen treated) 70% of patients got cured in 8 weeks of treatment. Whereas rest of the patients needed further treatment, with 2 patients required 18-19 weeks of treatment to achieve cure. While in Group B (10% KOH treated) 36.7% of the patients got cured in 2 weeks and 70% got cured in 4 weeks of 10% KOH treatment. 90% cured in 6 week of therapy. Only one patient who had >25 mollusci, require 12 weeks of therapy [Table 3].

Table-3: Response to treatment among group A and group B

Response (cured, in weeks)	Group A (Liquid nitrogen)		Group B (10% KOH)	
	No of patients	Percentages	No of patients	Percentages
2	-	-	11	36.7 %
4	3	15 %	10	33.3 %
6	5	25 %	6	20 %
8	6	30 %	2	6.7 %
10	2	10 %	-	-
12	1	5 %	1	3.3 %
>12	3	15 %	-	-
Total	20	100 %	30	100 %

Table-4: Side effects in response to treatment among group A and group B

Side effects	Group A (Liquid nitrogen)		Group B (10% KOH)	
	No of patients	Percentages	No of patients	Percentages
Hyperpigmentation	11	55 %	-	-
Hypopigmentation	2	10 %	17	56.7 %
Infection	1	5 %	5	16.7 %
Scarring	-	-	1	3.3 %
Erythema	3	6 %	2	6.7 %
Burning/stinging	13	65 %	6	20 %

In Group A, the most common side effect was burning pain seen in 65% of patients, followed by hyperpigmentation (55%), erythema (15%), hypopigmentation (10%) and infection (5%). While, the commonest side effect in Group B was hypopigmentation (56.6%), followed by burning or stinging (20%), infection (16.7%), erythema (6.7%) and infection (3.3%).

Discussion

MC, a cutaneous and mucosal eruption caused by Mullusipox virus, was first describe and later assigned its name by Bateman in the beginning of nineteenth century [4]. Comparing the data of this study with other study like with Mahajan BB et al [5] it shows the similar findings. In that study also about 70% of patients were from age group of preschool and school

going children. It might because that lesion in school going children is brought into notice by others, leading their parents to clinic for the treatment. Very slight male preponderance was seen in study by Mahajan BB et al i.e. 53.8% as compare to present study (62%)[5]. This might be because more frequent use of communal bathing facilities and participation in contact sports.

Also the swimming pool activities such as using a school swimming pool, the sharing of towels and bath sponges shown to increase the risk of having a more aggressive infection of MC [6]. However, one other study by Ormerod AD et al shows female preponderance (73.3%) [7]. The difference might be due to difference in environmental factors. The positive family history in present study found in 16% of cases.

The close contact transmission might be the cause of the disease in that case. Pruritus, infection and trauma were precipitating factors in nearly 36% of the participants. Other study by Silverburg NB et al shows pruritus in 14% and infection in 14% of participant as precipitating factors [8]. In present study one patient with forceps delivery developed lesions over scalp. The numbers of lesions shows that most of the patients had less than fifteen.

The similar finding were found in study by Mahajan BB et al. in which nearly 70% patients had lesion less than 15, while only 7.7% had lesion more than 20%. Face was the commonest site of the lesion at the time of presentation in present study, followed by trunk and the extremities. It might be because the lesions on face led the parents to notice the lesion. However the studies by Silverburg NB et al show only 20% lesions on the face and 85% on extremities and 72% on the trunk [8]. While Mahajan BB et al study shows 65.4% each on trunk and extremities while only 57.7% on face [5]. 1-3 mm was the approximate size of most (78%) of the lesions in this study. Few lesions were of larger size 4 -10 mm. However, none of the lesion of > 10 mm was found. This may be because this study was confined to pediatric patients. Pseudokobner phenomenon was found in 46% of cases. It may be precipitated by pruritus, infection, and trauma.

MC is usually self-limited and lesions heal without scarring in absence of secondary bacterial infection and so treatment is not always mandatory. However, treatment hastens the clearance and thus minimizes autoinoculation and transmission to other.

The mainstay for the treatment of MC is large which contains Physical therapy (cryo, laser, excision, curettage, electrodesiccation), chemical therapy (KOH, Phenol, podophyllin, keratolytics, tretinoin), antiviral therapy (ciclovir, ritonavir), and immunomodulators (imiquimod, interferon alpha). In this study two most common mode of therapy is being compared like cryotherapy by liquid nitrogen and KOH therapy [9,10,11]. 70% patients got cured in 8 weeks of therapy in group treated with liquid nitrogen. And only 2

patients require 18-19 weeks of therapy. Thus liquid nitrogen is effective mode of therapy, but long term treatment is required. While in group treated with 10% KOH 90% patients cured within 6 weeks if treatment. However, the similar response can be achieved within 2 – 3 weeks if 20% of KOH was used. But, in this study 10% KOH was used for safety in pediatric patients.

In group of patients with liquid nitrogen therapy burning pain at the time of application was the most common (65%) side effect and because of it children were afraid of getting it applied and cried while application. It also decreased compliance in the therapy. While in patients with KOH therapy burning or just stinging sensation seen only in 20% of patients. It was also lasted only for few minutes.

Hyperpigmentation was common side effect after liquid nitrogen therapy while hyperpigmentation was common side effect after KOH therapy. However the hypopigmentation with KOH was only transitory, and it was decreased over a period of time. Infection at local site seen in 5 cases with KOH therapy, though there were advised to apply topical sodium fusidate. But most of it clears without scarring. Only one case developed scarring at the site of infection.

Both liquid nitrogen cryotherapy and 10% KOH are effective modalities of treatments. But 10% KOH gives faster results in 2-4 weeks of duration, while liquid nitrogen requires longer duration of treatment of 8 – 12 weeks. Also liquid nitrogen is more painful procedure, perhaps it is difficult to apply in crying children. On contrary 10% KOH is painless, with only mild stinging sensation in few patients. Moreover 10% KOH has an advantage of application at home. So, it is more feasible and has higher compliance among parents, whereas liquid nitrogen needs regular weekly visits.

Conclusion

From above finding it can be concluded that 10% KOH is more effective modality of treatment as compared to liquid nitrogen, with advantage of early response and fewer side effects. Because of domiciliary treatment, patient has better compliance with 10% KOH. However, large number of sample size require for more concrete result.

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