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Treatment of molluscum contagiosum with coconut oil

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Abstract

Molluscum contagiosum is a benign viral infection. Two thirds of coconut oil consists of Medium Chain Triglycerides, these are extremely powerful antimicrobial agents.

Objective: to determine the efficacy and the possible side effects of coconut oil in the treatment of molluscum contagiosum.

Patients and Methods: 40 pediatric patients divided into two groups, 20 patients use coconut oil and other 20 patients use olive oil. All patients use the topical therapy twice daily for two weeks and followed for another two months.

Result: complete clearance was noticed in (40%), while in the control group only (5%) has complete clearance,. Only (25%) in the first group reveal no response at all while in the control group (90%) showed no reduction in the number of lesions.

Conclusion: coconut oil has an acceptable effective and preventive role in management of molluscum contagiosum infection

Keywords: Molluscum contagiosum, coconut oil, pediatrics

1. Introduction

Molluscum contagiosum (MC) is a benign but nonetheless frequently troublesome viral infection that generally affects young children. Patients and families are bothered by this infection because of its often prolonged course, because it may persist for months to years [1]. It is caused by a DNA poxvirus called the *molluscum contagiosum virus* (MCV). MCV has no nonhuman-animal reservoir (infecting primarily humans, though equine can rarely be infected). Four types of MCV are known, MCV-1 to -4; MCV-1 is the most prevalent and MCV-2 is seen usually in adults. The virus that causes molluscum is spread from person to person by touching the affected skin. The virus may also be spread by touching a surface with the virus on it, such as a towel, clothing, or toys. This common viral disease has a higher incidence in children, sexually active adults, and those who are immunodeficient [2]. MC can affect any area of the skin, but is most common on the trunk of the body, arms, groin, and legs. Molluscum contagiosum is contagious until the bumps are gone. Some growths may remain for up to 4 years if not treated [3]. In all forms of infection, the lesions are relatively similar. Individual lesions are smooth-surfaced, firm, dome-shaped, pearly papules, averaging 3-5 mm in diameter. "Giant" lesions may be up to 1.5 cm in diameter. A central umbilication is characteristic. The clinical pattern depends on the risk group affected. In young children the lesions are usually generalized and number from a few to more than 100. Genital lesions occurring as part of a wider distribution occur in 10% of childhood cases. When molluscum is restricted to the genital area in a child, the possibility of sexual abuse must be considered. In adults, molluscum is sexually transmitted and other sexually transmitted diseases may coexist [4].

Diagnosis of molluscum contagiosum is based on the distinctive appearance of the lesion. If the diagnosis is in question, a doctor can confirm the diagnosis with a skin biopsy [5].

In healthy patients, molluscum contagiosum is generally self-limited and heals spontaneously after several months. Individual lesions are seldom present for more than 2 months. Although treatment is not required, it may help to reduce autoinoculation or transmission to close contacts and improve clinical appearance [6]. Clinical success has been reported with the use of the following topical agents, which may act as irritants, stimulating an immunologic response: Imiquimod cream, Cantharidin, Tretinoin, Bichloroacetic acid, Trichloroacetic acid, Salicylic acid, Lactic acid, Glycolic acid, Silver nitrate, and Potassium hydroxide. Topical podophyllotoxin 0.5% cream self-administered twice daily for 3 weeks has been reported effective in a placebo-controlled, double-blind study [7,11].

A case report noted the efficacy of topical cidofovir in the treatment of disseminated molluscum in immunosuppressed patients [12].

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Cidofovir diphosphate was reported to inhibit molluscum contagiosum virus DNA polymerase activity [13].

Leaving mollusca to spontaneously resolve is often reasonable [14]. Varying degrees of physical trauma to individual lesions are used and are frequently quite successful. Physical trauma to individual molluscum contagiosum lesions can be performed with cryotherapy, lasers, curettage [15,16], expression of the central core with tweezers, rupture of the central core with a needle or a toothpick, electrodesiccation, shave removal, or duct tape occlusion. [17-19] in immunocompromised patients, improvement of lesions has been observed in individual patients treated with ritonavir, cidofovir (intravenous and topical), and zidovudine [20].

Coconuts and coconut oil have been traditional, staple foods of Asia, Africa, Central America and the Pacific Islands for thousands of years [21]. Two thirds of coconut oil consists of Medium Chain Triglycerides. These MCTs consist of lauric acid (48 percent). These fatty acids and their monoglycerides are extremely powerful antimicrobial agents, effective against a broad range of pathologic bacteria, viruses, fungi, yeasts and protozoa [22].

The antiviral properties of lauric acid was first discovered when researchers were investigating the anti-infective properties of human breast milk. Human and mammalian breast milk are rich in lauric. These fatty acids and monoglycerides provide protection against infections to babies, whose immune systems are still developing [23]. It has been reported that monolaurin is more effective in inactivating viruses and other infective agents than lauric acid. Monolaurin dissolves the lipids and phospholipids in the envelope of the virus causing the disintegration of the virus envelope effectively lysing the plasma membrane [24, 25].

The objective of this study to determine the efficacy and the possible side effects of coconut oil in the treatment of molluscum contagiosum.

2. Materials and Methods

This comparative study is designed to evaluate the efficacy of pure coconut oil in the treatment of Molluscum Contagiosum in comparison with a control (olive oil used as a vehicle in this study) and the topical side effects that may developed from both the coconut oil and the vehicle. The study is accomplished in AL-Yarmok teaching hospital and a private clinic from the period between February 2015 and januray 2016. In our study we prefer to involved 40 pediatric patients divided into two groups blindly exposed to both the coconut oil and the control (olive oil), 20 patients use the coconut oil and other 20 patients (the control group) use the olive oil.

A special designed informing data paper used for collecting information from either the patients or their parents, this include questions about the age, sex, and the address. The informing paper also contain fields about the sites and numbers of molluscum contagiosum lesions and the presence or absence of giant lesions. We also take a full history about the average duration, weather itchy or not. Inclusion criteria include all pediatrics below 10 years old proved clinically to be infected with molluscum contagiosum for the first time, exclusion criteria include any patient use topical or systemic therapy for the last 4 weeks, immunosuppressed, and any child receive vaccination in the last 4 weeks. All patients told to use the topical therapy twice daily for two weeks and to be seen after that and followed for another two months after clearance for the evidence of recurrence. The coconut oil used in this study is a pure Sri LanKen Coconut Oil manufactured by Hemani International KEPZ, Karachi Pakistan. The serving

size is a tablespoon equal to 14 gram. Each serving size contain total fat 14% per serving size. Student's *t*-test used for assessing the statistical significance of the difference between the patients use the coconut oil and the control group and *P*-value < 0.05 was considered as the level of significance. The assessment of response was carried out by the physician depending on the reduction and increment in the number of lesions in both groups.

3. Result

In first group who used the coconut oil which include twenty patients their ages ranged between 9 months and 9 years with their mean age \pm SD was 49.1 \pm 27.1months. 11 was female and 9 was male. While in the control group the ages of patients ranged between 2 and 9 years, their mean age \pm SD was 63.25 \pm 22,03 months, 9 was female and 11 was male.

The mean \pm SD of duration from the onset of infection till they present to the physician for the first group was 8.6 \pm 5.1weeks, and for the control group was 4.8 \pm 2.8 weeks. The number of lesions counted in each patients in the two groups and found that 75% in the first group has less than 10 lesions, and the rest of them has up to 20 lesions. While in the control group 70% has less than 10 lesions, which can be considered nearly equal.

The percent of areas involved with the infection in the first group who planned to use the coconut oil was 90% in face as the higher percentage followed by lip 55%, eyelid 35% while the trunk is the least area to be involved, only two patients (10%) has genital lesions. In the control group, there is no that match difference in the percentage of involvement with face being at the top while the trunk and buttock appear as the least area to be involved as shown in figure -1.

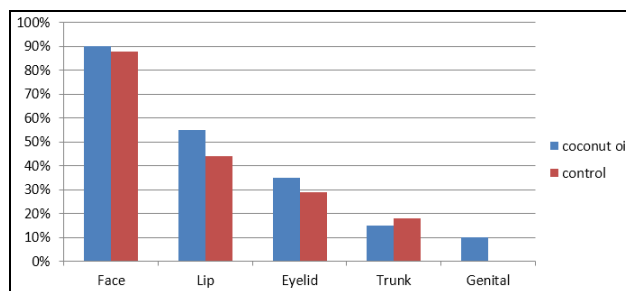


Fig 1: Percentage of area involvement in Iraqi pediatrics infected with Molluscum contagiosum.

As the patients or their parents encouraged to use the coconut oil in the first group twice daily, the first follow up visit after two weeks reveal that complete clearance was noticed in 8 patients (40%), while in the control group only one child (5%) has complete clearance, the *p*-value is 0.003556, this result considered significant at *p* < 0.05.

Three patients (15%) in the first group showed 75% reduction in the number of lesion and the patient or their family chose to continue on the same topical therapy to be seen after another two weeks, when they come back all three patients shows complete resolution of the persistent lesions. In the control group no patients show that difference in response according to number of lesions. The *p*- value is 0.037467, the result is significant at *p* < 0.05.

Four patients (20%) from the first group showed 25% reduction, in control group only one patient (5%) shows that percentage of reduction, the *p*-value is 0.079683, this result considered not significant at *p* < 0.05. The patient or their parents in both groups decided to switch to another form of therapy. Only five patients (25%) in the first group reveal no

response at all while in the control group 18 patients (90%) showed no reduction in the number of lesions, the *p*-value is

0.00001, this result considered significant at *p* < 0.05, all of this clarified in table no. 1.

Table 1: percent of reduction in the number of lesions after 2 weeks

%	Coconut oil group	Control group	Total No.	* <i>P</i> value
100%	8 patients 40%	1 patient 5%	9	0.003556
75%	3 patients 15%	Nil	3	0.037467
50%	Nil	Nil	0	0
25%	4 patients 20%	1 patient 5%	5	0.079683
0%	5 patients 25%	18 patients 90%	23	0.00001
Total No.	20	20	40	

**P*-value < 0.05 was considered as the level of significance

Regarding the side effect of either the coconut oil or the control (olive oil), no any irritation, burning sensation have been reported, and the healing process end without any residual crusting, erythema or hyperpigmentation. all patients from both groups who shows complete clearance followed up for another two visits each month, no recurrence have been reported in any one of them.



Fig 2



Fig 3: 9 years old girl with complete clearance after two weeks therapy with coconut oil (pictures taken by 5 megapixels camera-pretreatment picture less obvious because of restless child)



Fig 4



Fig 5: 8 years old girl with complete clearance after two weeks therapy with coconut oil (pictures taken by 5 megapixels camera-pretreatment picture less obvious because of restless child)



Fig 6



Fig 7: 2 years old child with complete clearance after two weeks therapy with coconut oil

4. Discussion

Molluscum contagiosum is caused by up to four closely related types of poxvirus, MCV-1 to 4 and their variants. Although the proportion of infection caused by the various types varies geographically, throughout the world MCV-1 infections are most common. Infection with MCV is

worldwide. Three groups are primarily affected: young children, sexually active adults, and immunosuppressed persons, especially those with HIV infection. Molluscum is most easily transmitted by direct skin-to skin contact, especially if the skin is wet. Swimming pools have been associated with infection^[4].

MCV is a large, brick-shaped Poxvirus that replicates within the cytoplasm of cells. It shares a number of genomic similarities with other poxviruses^[1] coconut oil research is revealing multiple health benefits for this oil. It has immunostimulating and anti-oxidant action^[22] coconut oil is a saturated fat consists of Medium Chain Triglycerides consist of lauric acid (48 %), capric acid (7 %) and caprylic acid (8 %). These fatty acids and their monoglycerides are extremely powerful antimicrobial agents. The monoglycerides have antiviral properties, diglycerides and triglycerides do not. Of the saturated fatty acids, lauric acid has greater antiviral activity than caprylic acid. Monolaurin dissolves the lipids and phospholipids in the envelope of the virus causing the disintegration of the virus envelope effectively lysing the plasma membrane. There is also evidence that signal transduction is also interfered with inhibiting the multiplication of the virus^[23, 24].

In the present study, we use coconut oil as a topical therapy in an ointment base applied twice daily in twenty Iraqi pediatrics in comparison with a twenty patients use olive oil as a control, they followed up for two months to report any sign of recurrence or side effect. Coconut oil reveal a complete clearance rate in 55% of patients (40% 8 patients after two weeks and 15% 3 patients after 4 weeks), while only five patient shows no response at all. If we compared this clearance rate with the result of control patients who using olive oil which clarify that only one patients has complete clearance, this leading us to considered the efficacy of coconut oil as an antiviral agent against the molluscum contagiosum pox virus especially, and DNA virus in general. Another important things is the absence of the development of new lesions in all patients who use the coconut oil, while those patients on olive oil (The control group) most of them shows either no reduction in the number of lesions or appearance of new lesions which urge us or even the parents to stop this option of topical therapy and use another option for treatment of this infection. This lead us to notice the preventive role of the coconut oil in the spreading of molluscum contagiosum.

5. Conclusion

coconut oil has an acceptable effective and preventive role in management of molluscum contagiosum infection In addition to that, depending on the results of this study, there is no reported any side effect during the application and after the following period.

We recommended to use the extract (lauric acid) of coconut oil in future studies as it has the greatest antiviral activity, and advice the dermatologists to learn the parents who have an infected member of the family to apply the pure coconut oil to other contacts as this may have a good preventive role for such infection.

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