Topical Imiquimod is an Effective and Safe Drug for Molluscum Contagiosum in Children

Dear Editor,

Molluscum contagiosum (MC) is a very common skin infection caused by a molluscipox virus gene of the poxvirus family. It usually occurs in young children, sexually active adults, and immunocompromised individuals. The typical clinical picture of this infection is characterized by asymptomatic flesh-colored, single or multiple papules, measuring 2-6 mm in diameter with a central umbilication that occur on the skin and the mucous membranes. In adults, the skin lesions are predominantly located in the genital region, whereas in children they are found on the trunk, the extremities, and the face.

MC is generally regarded as a self-limited disease; however, its treatment is usually advisable considering its potentially protracted course and the risk of superinfection, scarring, autoinoculation, and transmission to other members of the community.

A large number of approaches to the treatment of MC have been used so far (none of them approved by the Food and Drug Administration (FDA)) includ-

Table 1. Demographic data and therapeutic response of the children with molluscum contagiosum which were treated with topical imiquimod under occlusion

No	Gender	Age (years)	Location of the lesions	Response (%)	Duration of treatment (weeks)
1	M	8	Face	100	6
2	F	10	Trunk	82.35	10
3	F	12	Face	100	6
4	M	7	Extremities	84.61	10
5	M	5	Trunk	100	7
6	M	8	Extremities	100	5
7	M	8	Trunk	100	4
8	F	11	Face	100	5
9	M	8	Face	61.13	12
10	F	7	Trunk	100	5
11	F	4	Extremities	100	5
12	F	3	Extremities, trunk*	100	3
13	F	7	Trunk	100	5
14	F	12	Face	100	6
15	M	13	Face	100	6
16	M	10	Trunk	100	5
17	M	8	Extremities	100	4
18	F	9	Trunk	100	8
19	M	6	Face	55.55	11
20	M	5	Face	63.63	12
21	F	9	Face	100	5
22	F	12	Extremities	100	6
23	F	11	Trunk	58.33	10

M = male; F = female; * = disseminated lesions

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ing ablative regimens (curettage, electrodessication, cryotherapy, laser therapy) and topical or systemic pharmacologic agents (tretinoin, cantharidin, trichloroacetic and salicylic acid, potassium hydroxide, interferon-alfa, and cimetidine).

Imiquimod is a topically applicable Toll-like receptor (TLR)-7/8 agonist, which is capable of stimulating the innate cutaneous immunity and the cellular arm of the adaptive immune response and of exerting potent anti-viral, anti-tumor and immunoregulatory effects (1). Originally approved for the treatment of external genital and perianal warts in adults, imiquimod was later approved for the therapy of basal cell carcinomas and actinic keratoses and has also been used in the management of several off-label indications including cutaneous infections and neoplasms.

Our group has successfully used topical imiquimod in the treatment of a variety of dermatoses including granuloma annulare, pyogenic granuloma, herpes labialis, and lichen striatus (2-6). Moreover, we have examined the topical application of imiquimod over the last twelve years in the treatment of 23 children with MC, the demographic data and the therapeutic response of which are summarized in Table 1. Seventeen out of 23 children (73.91%) treated with topical imiquimod once daily under occlusion (including two cases with disseminated lesions) showed a complete remission within 3 to 8 weeks of treatment. Furthermore, 6 other children who switched to other forms of treatment showed a partial remission (55.55%-84.61%) after 10 to 12 weeks of therapy. The only cutaneous adverse reaction to topical imiquimod was a mild to moderate irritation in the application area that was observed in all treated children, whereas no systemic side effects could be seen. Our findings are compatible with those of other groups, who also demonstrated the therapeutic efficacy and safety of topical imiquimod in MC.

Interestingly, in two very similar subsequent papers Katz and Swetman (7) and Katz (8,9) expressed the view that "imiquimod is neither efficacious nor safe in the treatment of MC in children". This view was not the result of the author's clinical experience but was exclusively based on the findings of two randomized clinical trials (RCTs). These were carried out in 2006 upon request of the FDA from the drug's original manufacturer (3M) and "definitely showed that imiquimod does not effectively treat MC in children". Surprisingly, today, 10 years after their completion, these RCTs still remain unpublished, whereas the corresponding FDA site provides no information with regard to the researchers, the centers in which these trials were conducted, their research protocol, and the demographic data of the enrolled patients.

In a very recent review on childhood skin infections, Rush and Dinulos (10), exclusively based on Dr. Katz's paper, fully adopted this view and stated that "imiquimod is neither efficacious nor safe in the treatment of MC", although they admit that the RCTs cited by the latter still remain unpublished. In contrast to these authors, we reject Dr Katz's inexplicable request to the medical community to fully ignore all articles published in peer-reviewed journals that demonstrate the efficacy and safety of imiquimod in MC. We do not claim that imiquimod is a panacea. However, based on our clinical experience and that of other groups, we are convinced that this compound represents a very useful and painless tool in the dermatologic arsenal for the treatment of MC, an otherwise difficult to manage dermatosis, particularly in children.

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