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LETTER - RESEARCH

Evaluation of the efficacy and safety of hydrogen peroxide in the treatment of molluscum contagiosum in children compared to potassium hydroxide: a pilot study☆

Dear Editor,

Molluscum contagiosum (MC), an infectious dermatosis caused by a virus of the *Poxviridae* family,[1] mainly affects children, with transmission occurring through direct contact.[2] It presents as 2 to 3 mm, rounded, pink, or normochromic papules, with central umbilication and a plug of caseous material.[3]

Although considered a self-limited disease, its treatment alleviates discomfort, and prevents infectious complications, transmission, and self-inoculation,[3] refraining social marginalization of the patient and parental anxiety.

There are several types of therapy for MC[2–4] but many of these methods can generate uncomfortable effects that make adherence difficult, leading to therapeutic failure, anxiety and psychological trauma for children and families.[4] A widely studied method is a 5% potassium hydroxide (KOH) solution, which, despite being effective, causes uncomfortable side effects, such as pain and dyschromia.[5] Therefore, it is necessary to search for other treatment options that may bring more comfort and adherence to therapy. A promising option is hydrogen peroxide (H_2O_2). It has antimicrobial action through the oxidation of viral molecules, damaging their DNA and leading to cytotoxicity,[6] but without major damage to adjacent tissue. Thus, its adverse effects are generally mild.[7] However, there is still a scarcity of studies demonstrating its real efficacy and safety.[8]

Accordingly, this study evaluated the efficacy and safety of using H_2O_2 1% cream as MC treatment in pediatric patients. And, it was comparared with KOH 5% solution, through a double-blind, randomized, placebo-controlled pilot study with 30 patients with MC, aged 2 to 16 years, who had had no treatment for the disease in the previous six months, randomly allocated into three treatment groups following the order of arrival. Group A was submitted to treatment with H_2O_2 1% cream; Group B, treatment with KOH 5% solution; Group C, treatment with Lanette cream (placebo), all applied twice a day, continuously used until the lesions became irritated. The participants were evaluated every 4 weeks for three months through photographic records and clinical evaluation by a dermatologist blinded to the intervention, regarding the number of lesions, their reduction, and side effects. Parents perception was also recorded throughout a specific questionnaire. Of the 30 patients, seven did not complete the study (five due to poor adherence to treatment; one due to loss of follow-up; and one due to an adverse effect of KOH), leaving 23 individuals - eight in Group A, seven in Group B and eight in Group C.

Figure 1 Reduction of ≥ 50% of lesions (A, Hydrogen peroxide; B, Potassium hydroxide; C, Placebo).

Regarding the percentage reduction of lesions (Fig. 1), in the 4th week, there was a greater reduction of 50% of lesions in almost 40% of the patients in Group A, close to Group B (42.9%; p = 1) and higher than Group C (25%; p = 1). In the 12th week, this reduction reached 85% of the patients in Group A, lower than in Group B (100%), but higher than in Group C (62.5%; p = 1).

☆ Study conducted at the Pediatric Dermatology Outpatient Clinic, Department of Dermatology, Hospital Universitário Evangélico Mackenzie, Curitiba, PR, Brazil.

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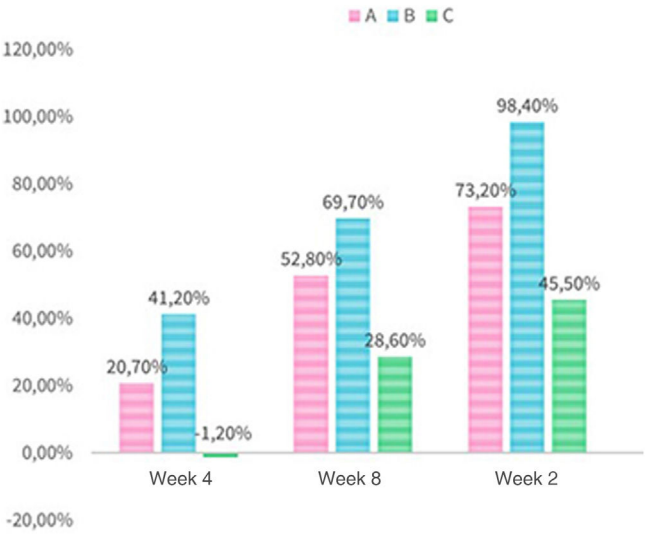

Figure 2 Absolute reduction of total lesions (A, Hydrogen peroxide; B, Potassium hydroxide; C, Placebo).

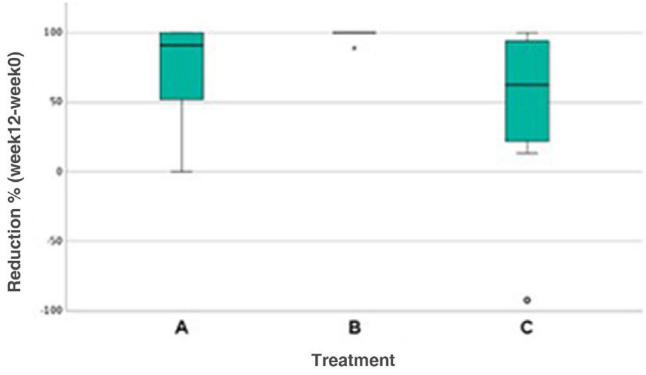

Figure 3 Analysis of the number of lesions (A, Hydrogen peroxide; B, Potassium hydroxide; C, Placebo).

The absolute reduction in the number of total lesions (Fig. 2), considering the sum of all patients, was 20.7% in Group A in the 4th week, lower than that obtained in Group B (41.2%; p = 0.265). Both Group A and Group B showed higher values than the placebo group, which on the other hand showed an increase in the number of lesions during this period. In the 12th week, 73.2% of the lesions had resolved in Group A (p = 0.034), lower than the 98.4% reduction seen in Group B (p = 0.034), but higher than in Group C (45.5%; p = 0.034).

It was also observed that Group A showed greater variability in results between patients, while Group B showed almost no dispersion. Although Group C also had cases of improvement, there were cases of worsening of the condition (Fig. 3).

Regarding parents perception of side effects, from the 4th to 12th week (p = 1, p = 1, p = 0.846), 50% of the patients in Group A experienced some adverse event. In Group B, 70% of the patients experienced adverse effects in the 4th week, 42.9% in the 8th week and more than 80% in the 12th week (p = 1, p = 1, p = 0.846, respectively). There were also reports of adverse effects in Group C, 37.5%, 25% and 75% in weeks 4, 8 and 12, respectively, which can be attributed to symptoms of the natural evolution of the disease.[3]

Of the reported side effects, erythema was present in 37.5% of the patients in Group A in the 4th week, similar to what was found in Group C (37.5%; p = 1) and lower than that in Group B (57.1%; p = 1). In the 12th week, Group A showed more erythema when compared to the other groups (A: 37.5%; B: 14.3%; C: 12.5%; p = 1).

As for crusts, they were present in 25% of the patients in Group A in the 4th week and absent in the 8th and 12th weeks, while in Group B, they were present in 14.4% throughout all weeks, close to the values in Group C (13%; p = 1).

As for erosions/ulcers, Groups A and C did not show them in any of the evaluations, whereas 14.3% of all patients in Group B had these signals in the 12th week.

Pruritus was more prevalent in Group A compared to the two other groups in all weeks, affecting 25% of children in the 12th week. Group B, on the other hand, did not report pruritus, unlike other studies, in which this symptom is a common finding.[8]

Burning/pain sensation was present in 12.5% of individuals in Group A in all weeks, the same as in Group C (12.5%). In Group B, this value was almost four times higher in the 4th week (57.1%; p = 0.357); and reached 71.4% of the patients in the 12th week (p = 0.122).

In Group A, 25% of the children had dyschromia in the 12th week, lower than what was seen in Group C (37.5%, p = 1) and also Group B, which had 71.4% in the 4th week (p = 0.021), with persistence of the condition in almost half of the patients in the 12th week (42.9%; p = 1).

It can be concluded that the use of H_2O_2 showed a tendency towards superior efficacy in relation to the placebo, but still lower than that of KOH. However, it seems to be a promising therapy due to its safety and lower incidence of side effects such as burning sensation, pain and dyschromia. Due to these findings, it may be a good option for younger children, with more sensitive skin and intolerant to the adverse manifestations caused by KOH. As this is a pilot study with a small sample, it did not obtain the necessary statistical significance to allow a conclusion on the real effectiveness of H_2O_2, requiring further larger sample studies to guarantee statistically significant efficacy and safety results.

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Authors' contributions

Elinah Narumi Inoue: Data collection, analysis and interpretation of data; drafting and editing of the manuscript; collection, analysis and interpretation of data; critical review of the literature.

Felipe de Paula Saboia: Data collection.

Amanda Hertz: Data collection.

Marcia Olandoski: Statistical analysis.

Dâmia Kuster Kaminski Arida: Design and planning of the study; data collection, or analysis and interpretation

of data; drafting and editing of the manuscript or critical review of important intellectual content; collection, analysis and interpretation of data; effective participation in research orientation; intellectual participation in the propaedeutic and/or therapeutic conduct of the studied cases; approval of the final version of the manuscript.

Conflicts of interest

None declared.

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